

EXHIBIT 1



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Hedloy

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(54) **METHOD, SYSTEM AND COMPUTER READABLE MEDIUM FOR ADDRESSING HANDLING FROM A COMPUTER PROGRAM**

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This patent is subject to a terminal disclaimer.

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(58) **Field of Classification Search** **715/230**
See application file for complete search history.

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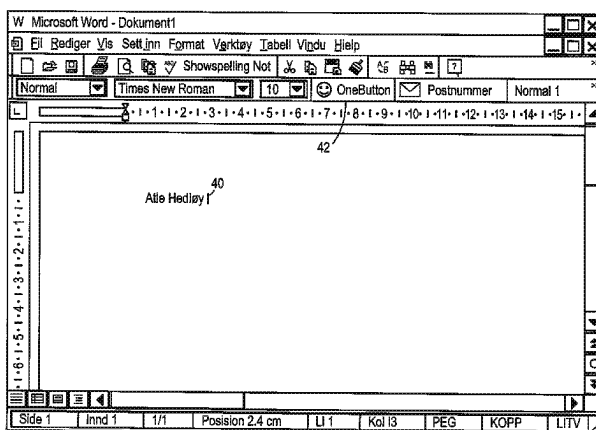
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(57) **ABSTRACT**

A method, system and computer readable medium for providing for providing a function item, such as a key, button, icon, or menu, tied to a user operation in a computer, whereby a single click on the function item in a window or program on a computer screen, or one single selection in a menu in a program, initiates retrieval of name and addresses and/or other person or company related information, while the user works simultaneously in another program, e.g., a word processor. The click on the function item initiates a program connected to the button to search a database or file available on or through the computer, containing the person, company or address related data, in order to look up data corresponding to what the user types, or partly typed, e.g., name and/or address in the word processor, the correct data from the database, data related to the typed data, e.g., the name of the person, company, or the traditional or electronic address, or other person, or company, or address related data, and alternatively the persons, companies, or addresses, are displayed and possibly entered into the word processor, if such related data exists.

44 Claims, 14 Drawing Sheets



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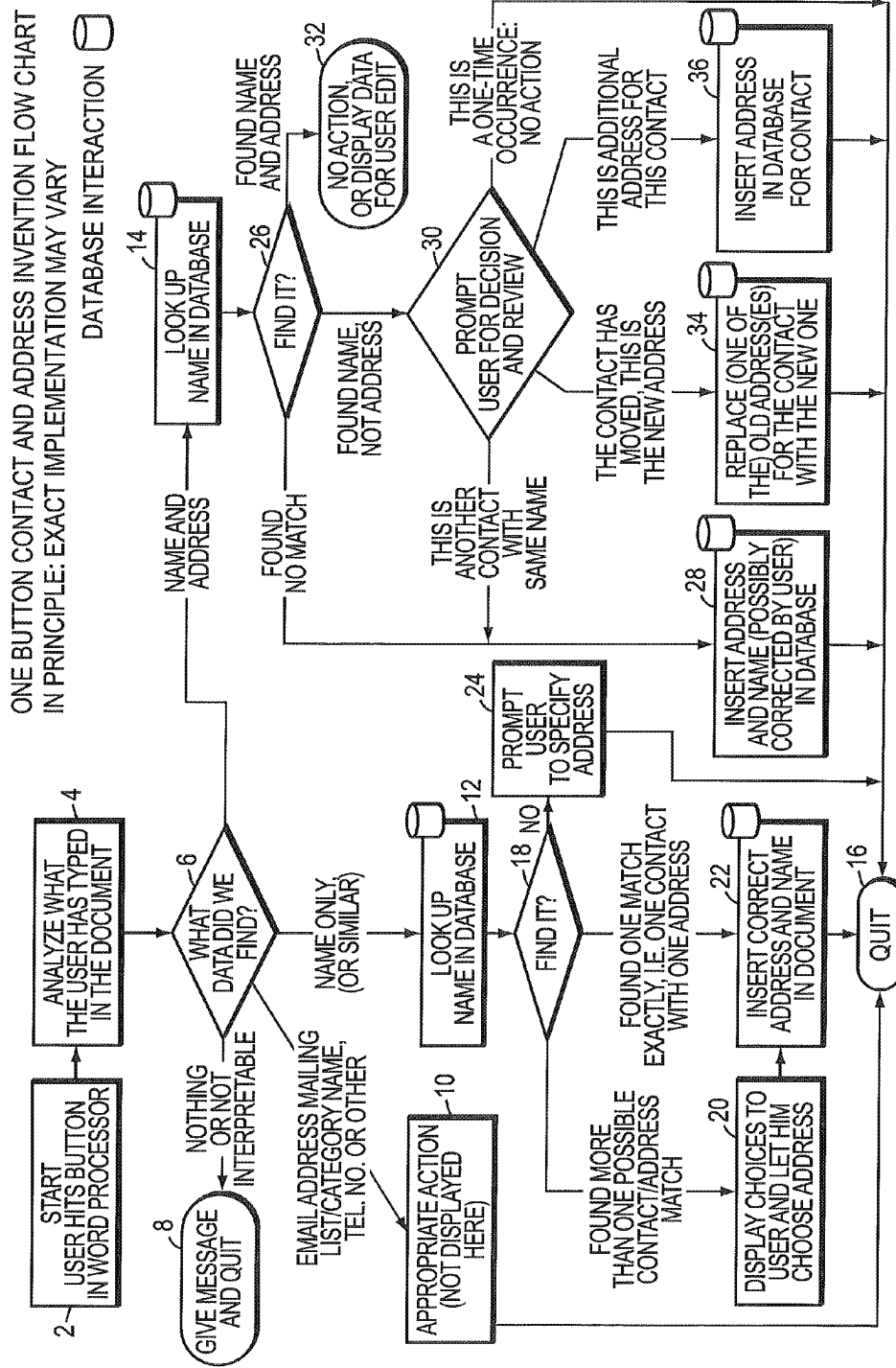


FIG. 1

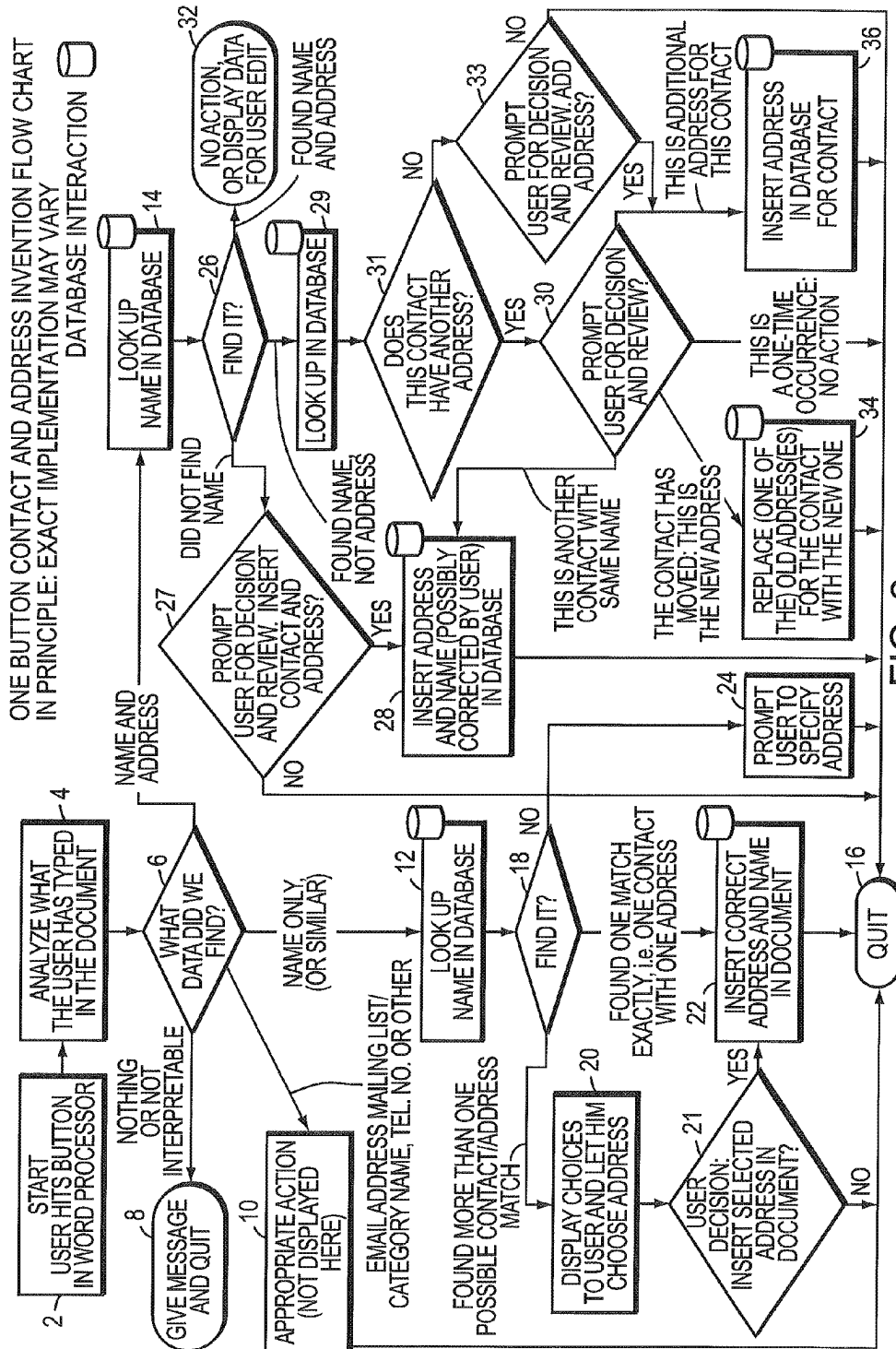


FIG. 2

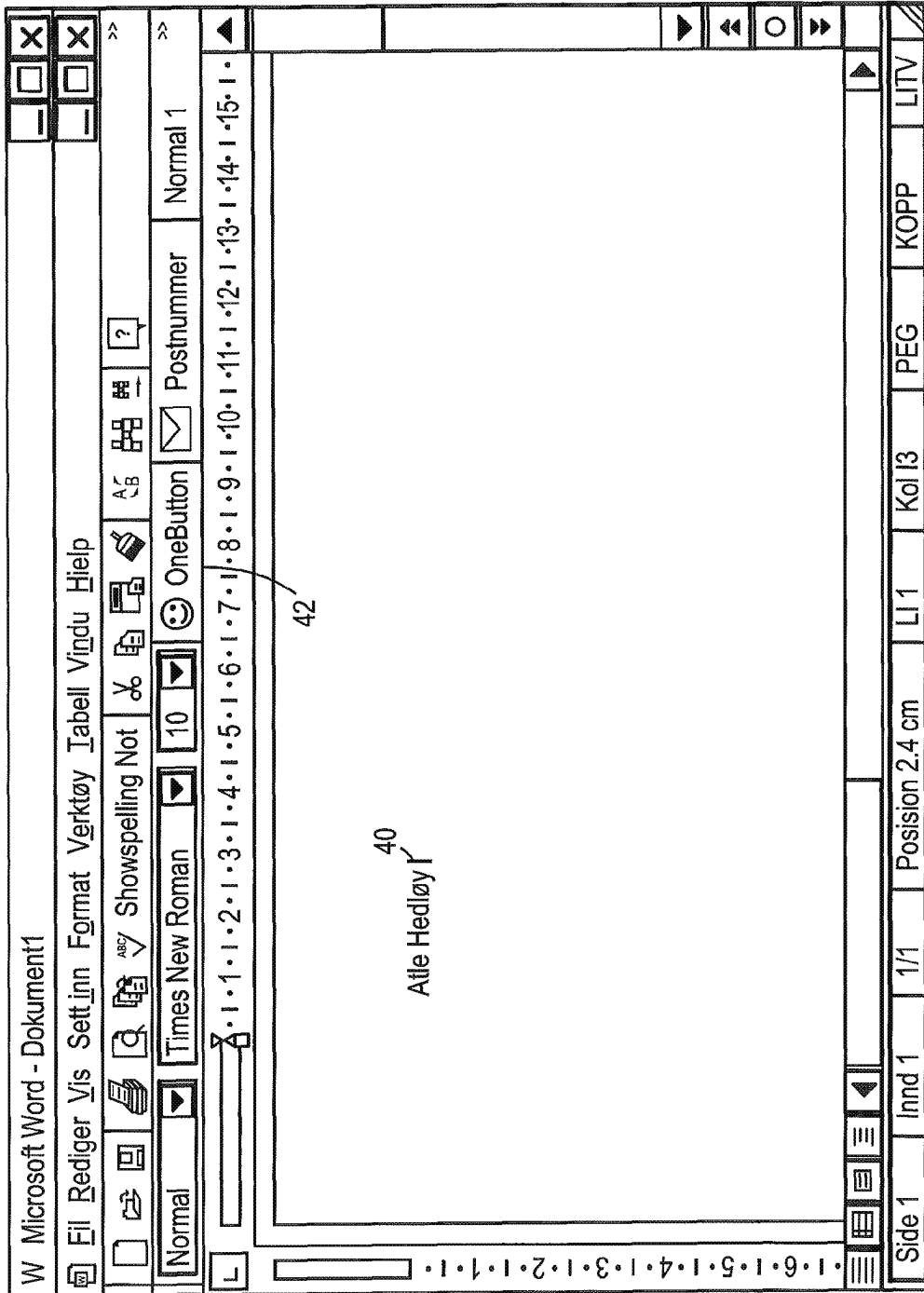


FIG. 3

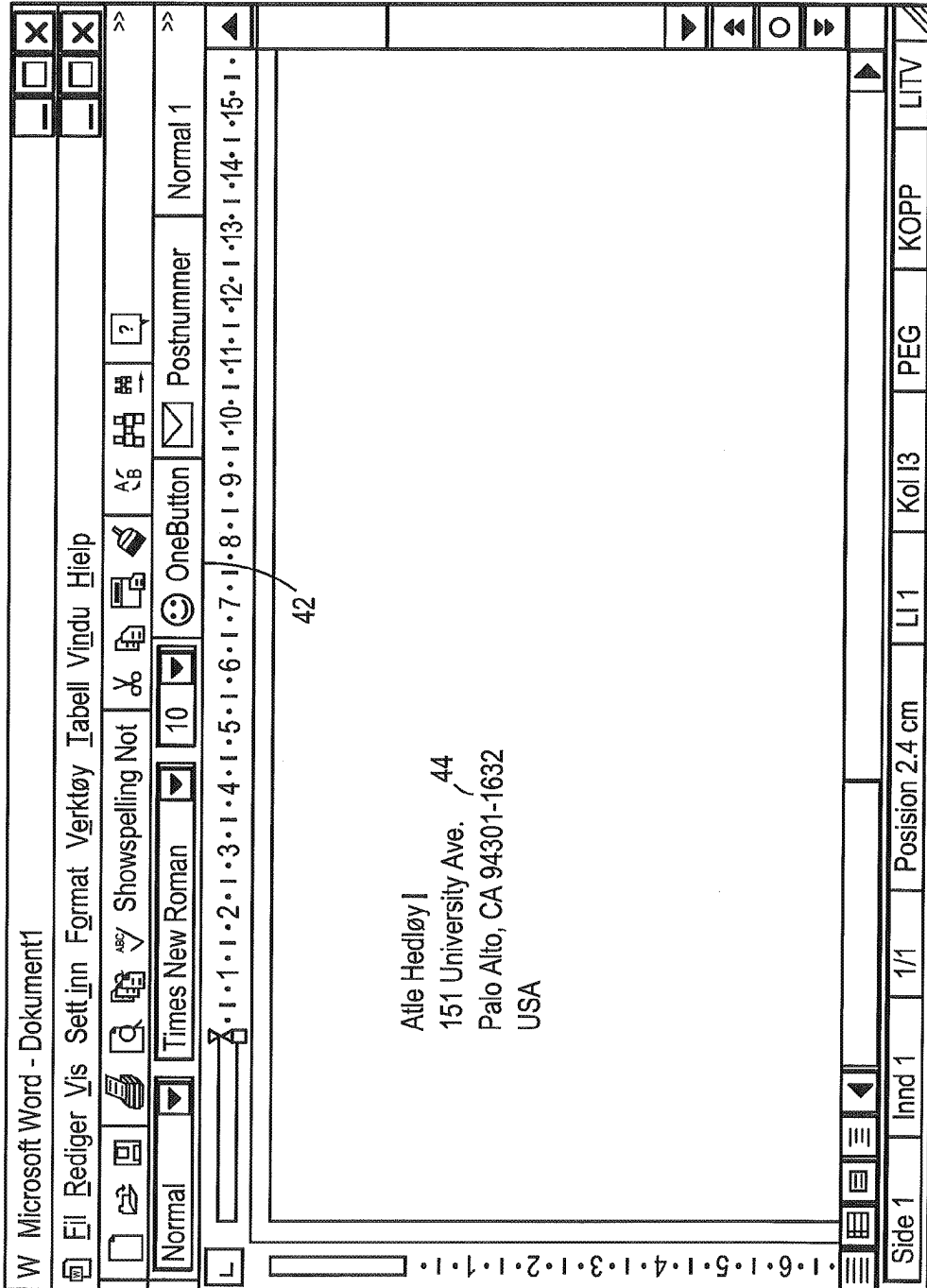


FIG. 4

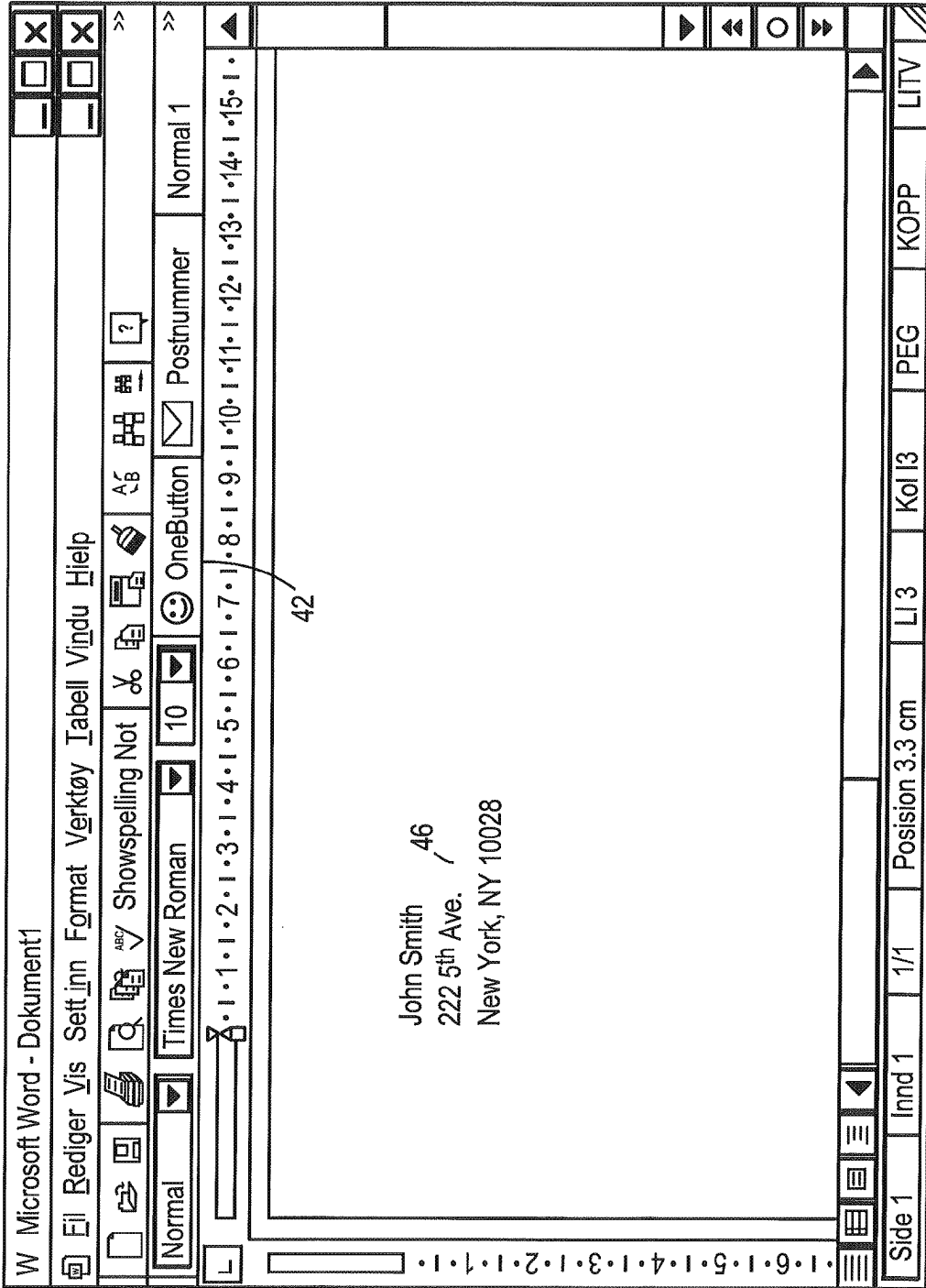


FIG. 5

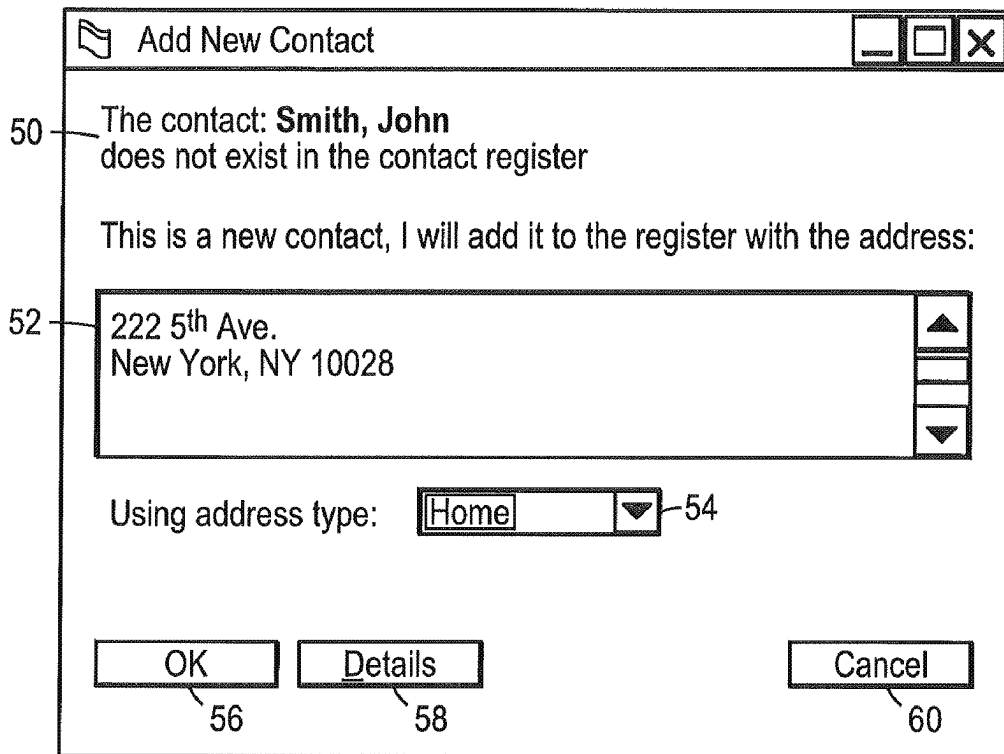


FIG. 6

The screenshot shows a software window titled "Arendi OneButton Contact Register". The window contains a form with the following fields and controls:

- Name:** A label followed by a dropdown menu (64) and a text input field containing "John".
- Title:** A text input field containing "Smith".
- Address type:** A dropdown menu (54) containing "Home".
- Street:** A text input field containing "222 5th Ave.".
- City:** A text input field containing "New York".
- State/Province:** A text input field containing "NY".
- ZIP/Postal:** A text input field containing "10028".
- Country:** A dropdown menu.
- Company:** A text input field.
- Buttons:** "Add and Choose" (64), "Options..." (66), and "Cancel" (60).
- Footer:** A text label "Dette er en test".

Reference numerals 62, 64, 54, 66, and 60 are placed near their respective elements in the diagram.

FIG. 7

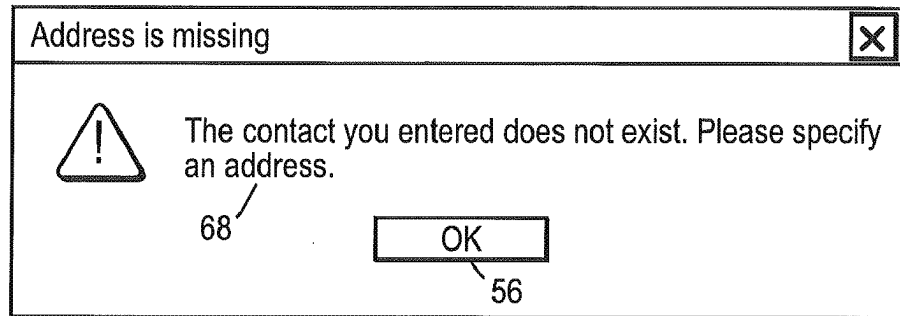


FIG. 8

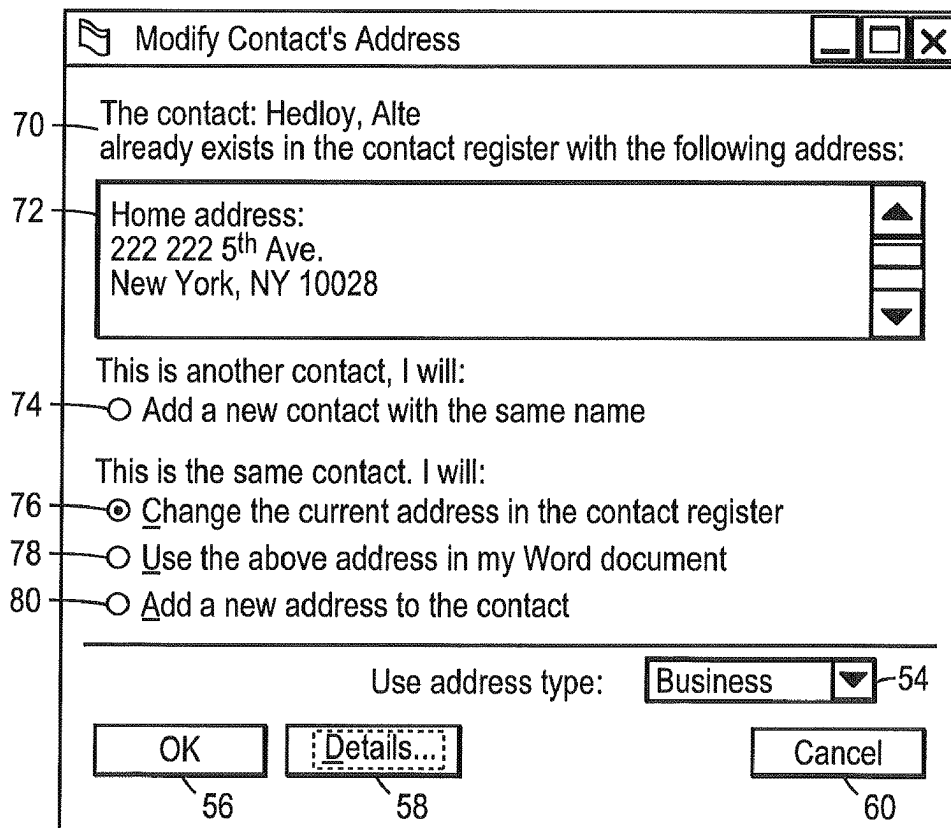


FIG. 9

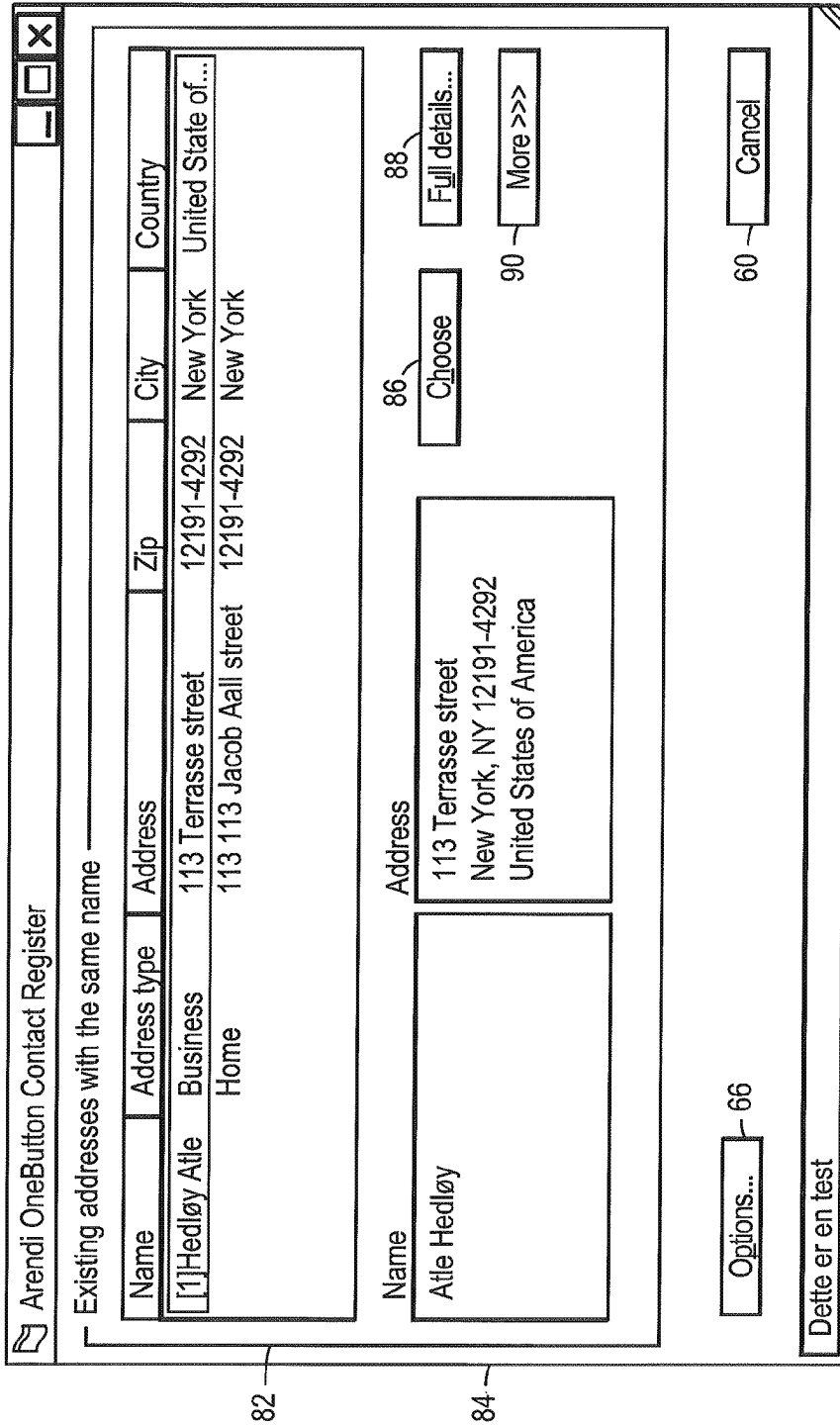


FIG. 10

The screenshot shows a window titled "Arendi OneButton Contact Register". It displays a list of existing addresses with columns for Name, Address type, Address, Zip, City, and Country. Two addresses are listed: "Hedløy Atle" (Business) and "Hedløy Atle" (Home). Below the list, a detailed view of the selected "Home" address is shown, including fields for Name, Address, and a "Full details..." button. To the right, a form for editing the address is visible, with fields for Title, First, Middle, Last, Suffix, Company, Address type, Street, City, State/Province, ZIP/Postal, and Country. A "Cancel" button is at the bottom right. Reference numerals 82, 84, 62, 64, 66, 86, 88, 90, 54, and 92 are placed near various UI elements.

82

84

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54

92

FIG. 11

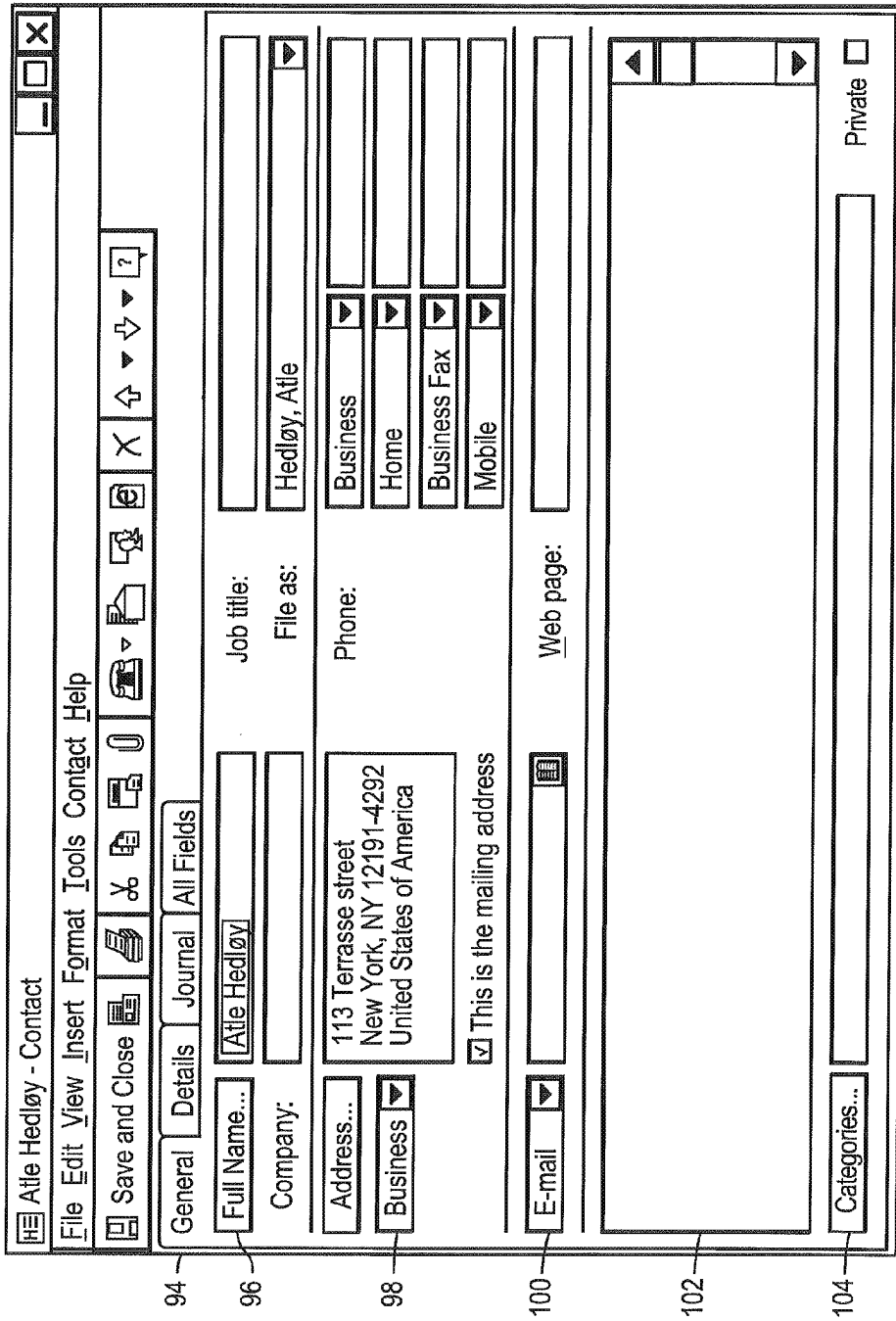


FIG. 12

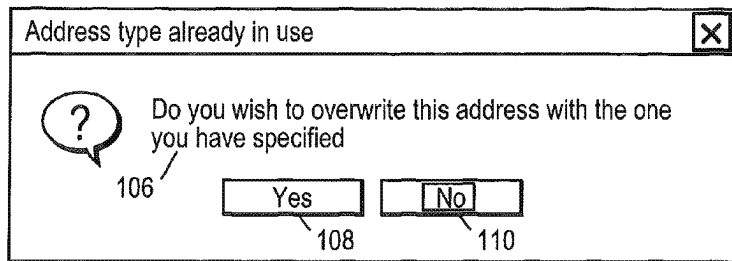


FIG. 13

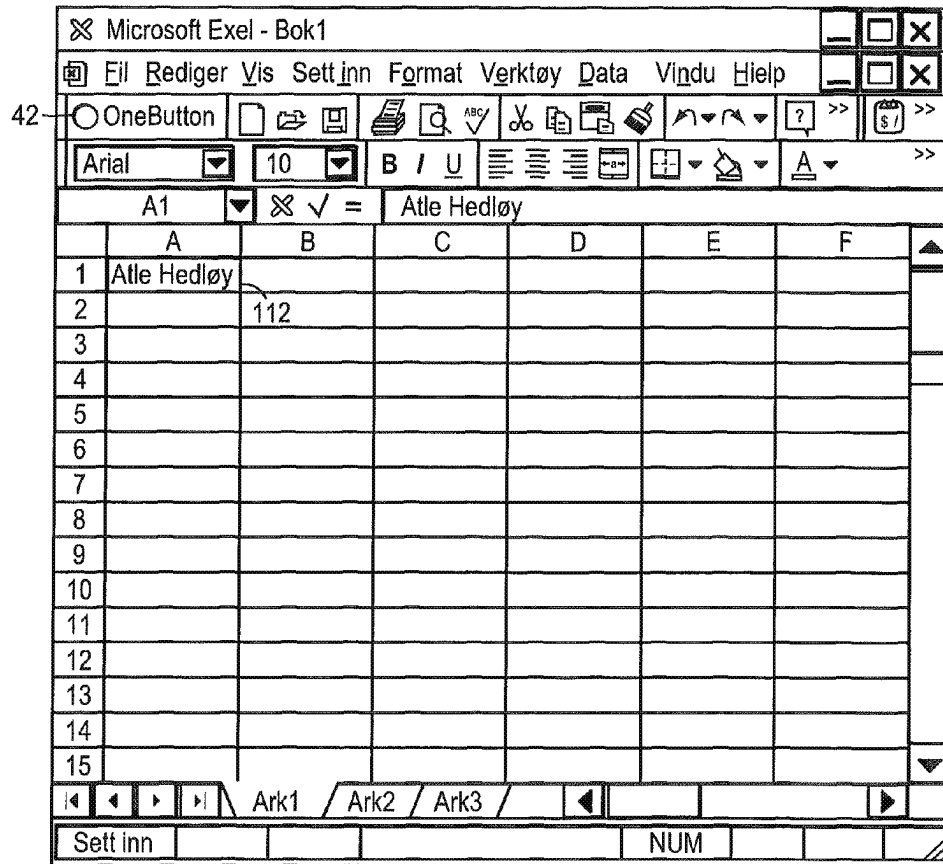


FIG. 14

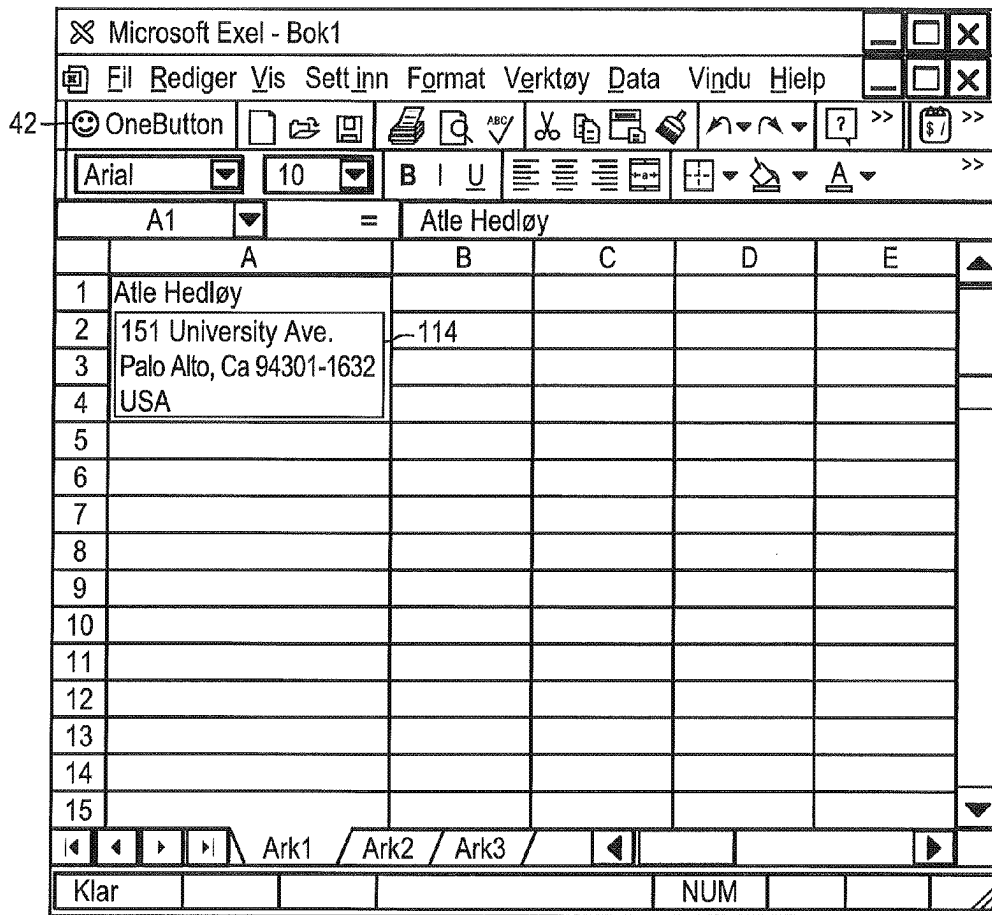


FIG. 15

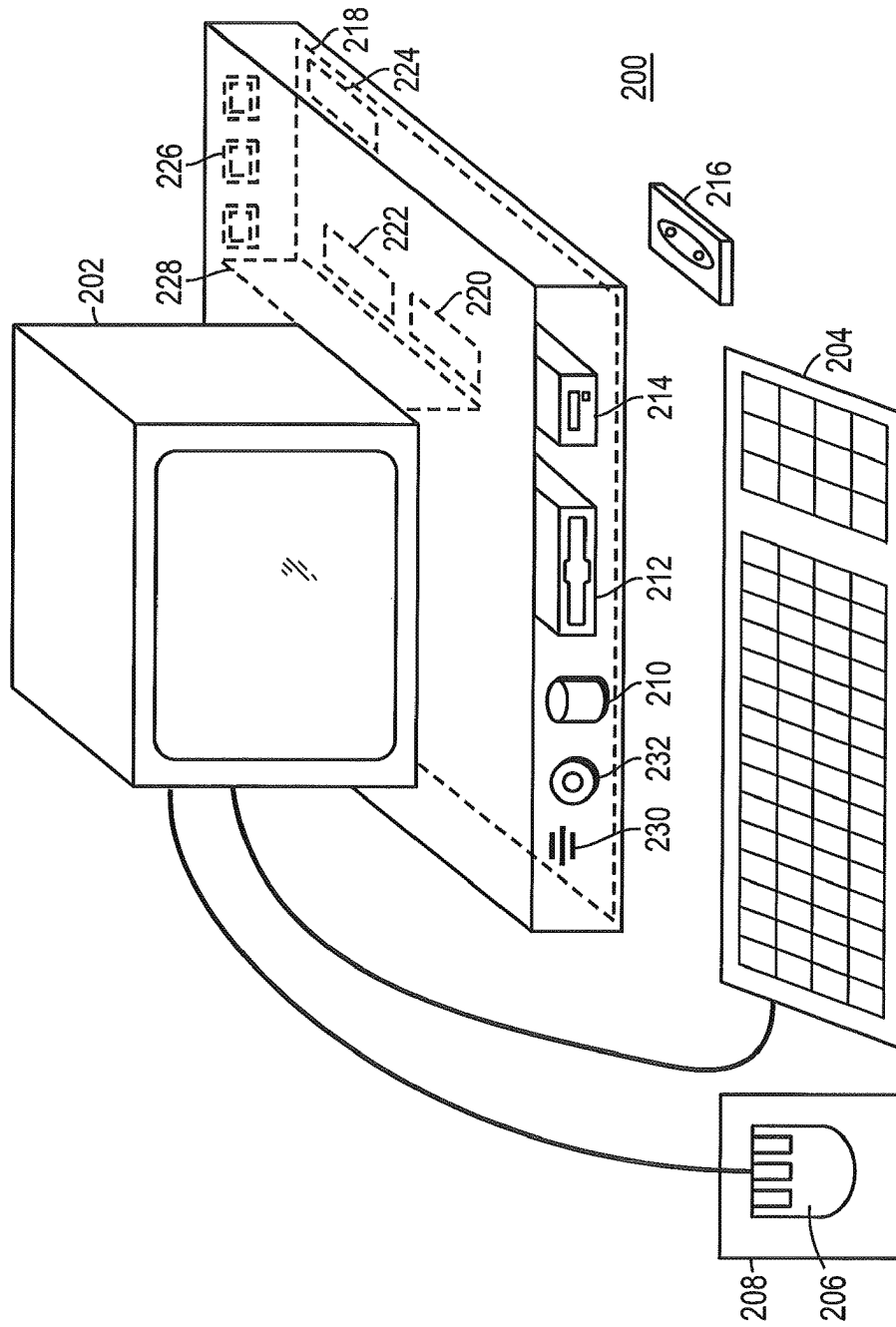


FIG. 16

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**METHOD, SYSTEM AND COMPUTER
READABLE MEDIUM FOR ADDRESSING
HANDLING FROM A COMPUTER PROGRAM**

CROSS REFERENCES TO RELATED
APPLICATIONS

The present application is a continuation of U.S. application Ser. No. 09/923,134 filed on Aug. 6, 2001, which in turn is a continuation of U.S. application Ser. No. 09/189,626 filed on Nov. 10, 1998, and which issued as U.S. Pat. No. 6,323,853. Each of the above-described applications is hereby incorporated by reference in their entireties.

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a method, system and computer readable medium for name and address handling (hereinafter called "address handling"), and more particularly to a touch screen, keyboard button, icon, menu, voice command device, etc. (hereinafter called "button") provided in a computer program, such as word processing program, spreadsheet program, etc., and coupled to an information management source for providing address handling within a document created by the computer program.

2. Discussion of the Background

In recent years, with the advent of programs, such as word processors, spreadsheets, etc. (hereinafter called "word processors") users may require retrieval of information, such as name and address information, etc., for insertion into a document, such as a letter, fax, etc., created with the word processor. Typically, the information is retrieved by the user from an information management source external to the word processor, such as a database program, contact management program, etc., or from the word processor itself, for insertion into the document. Examples of such word processors are WORD™, NOTEPAD™, EXCEL™, WORDPAD™, WORDPERFECT™, QUATROPRO™, AMIPRO™, etc., and examples of such information management sources are ACCESS™, OUTLOOK™, ORACLE™, DBASE™, RBASE™, CARDFILE™, etc.

However, the information in the database must constantly be updated by the user. This requires the user to learn how to use and have access to the database. In this case, a change in the information, such as change in address or a name, etc., requires the user of the word processor to implement this change in the database, or alternatively, the change is made to the database centrally by a database administrator.

SUMMARY OF THE INVENTION

Accordingly, an object of the present invention is to provide a method, system and computer readable medium for address handling within a computer program.

Another object of the present invention is to provide a method, system and computer readable medium for address handling within a computer program, such as a word processing program, spreadsheet program, etc.

Another object of the present invention is to provide a method, system and computer readable medium for address handling within a computer program, such as a word processing program, spreadsheet program, etc., using an input device provided in the computer program.

Another object of the present invention is to provide a method, system and computer readable medium for address handling within a computer program, such as a word process-

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ing program, spreadsheet program, etc., using an input device, such as a touch screen, keyboard button, icon, menu, voice command device, etc., provided in the computer program and coupled to an information management source.

Another object of the present invention is to provide a method, system and computer readable medium for address handling within a computer program, such as a word processing program, spreadsheet program, etc., using an input device such as a touch screen, keyboard button icon, menu, voice command device, etc., provided in the computer program and coupled to an information management source, such as a database program, contact management program, etc.

The above and other objects are achieved according to the present invention by providing a novel method, system and computer readable medium for providing a function item, such as a key, button, icon, or menu, tied to a user operation in a computer, whereby a single click on the function item in a window or program on a computer screen, or one single selection in a menu in a program, initiates retrieval of name and addresses and/or other person or company related information, while the user works simultaneously in another program, e.g., a word processor. The click on the function item initiates a program connected to the button to search a database or file available on or through the computer, containing the person, company or address related data, in order to look up data corresponding to what the user types, or partly typed, e.g., name and/or address in the word processor, the correct data from the database, data related to the typed data, e.g., the name of the person, company, or the traditional or electronic address, or other person, or company, or address related data, and alternatively the persons, companies, or addresses, are displayed and possibly entered into the word processor, if such related data exists.

The present invention also includes a computer readable medium storing program instructions by which the method of the invention can be performed when the stored program instructions are appropriately loaded into a computer, and a system for implementing the method of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention description below refers to the accompanying drawings, of which:

FIG. 1 is a flow chart illustrating a method for address handling within a computer program, according to an exemplary embodiment of the present invention;

FIG. 2 is a flow chart illustrating a method for address handling within a computer program, according to another exemplary embodiment of the present invention;

FIG. 3 is a screen shot illustrating the inputting of a name to be searched and an address handling button within a word processor, according to an exemplary embodiment of the present invention;

FIG. 4 is a screen shot illustrating a retrieved address in a word processor, according to an exemplary embodiment of the present invention;

FIG. 5 is a screen shot illustrating the inputting of a name and address to be searched and an address handling button within a word processor, according to an exemplary embodiment of the present invention;

FIG. 6 is a screen shot illustrating an add new contact message window, according to an exemplary embodiment of the present invention;

FIG. 7 is a screen shot illustrating a contact register message window, according to an exemplary embodiment of the present invention;

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FIG. 8 is a screen shot illustrating an address missing message window, according to an exemplary embodiment of the present invention;

FIG. 9 is a screen shot illustrating a modify contact's address message window, according to an exemplary embodiment of the present invention;

FIG. 10 is a screen shot illustrating a select a contact address register message window, according to an exemplary embodiment of the present invention;

FIG. 11 is a screen shot illustrating a more detailed mode of registering an additional address for the contact register of FIG. 9, according to an exemplary embodiment of the present invention;

FIG. 12 is a screen shot illustrating a contact management program window in a full detailed mode, according to an exemplary embodiment of the present invention;

FIG. 13 is a screen shot illustrating an address already in use message window, according to an exemplary embodiment of the present invention;

FIG. 14 is a screen shot illustrating the inputting of a name to be searched and an address handling button within a spreadsheet, according to an exemplary embodiment of the present invention;

FIG. 15 is a screen shot illustrating a retrieved address in a spreadsheet, according to an exemplary embodiment of the present invention; and

FIG. 16 is a schematic illustration of a general purpose computer for performing the processes of the present invention, according to an exemplary embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In an embodiment of the present invention, single button addressing is achieved by providing an input device, such as a touch screen, keyboard, icon, menu, voice command device, etc. (hereinafter called "button"), in a computer program, such as a word processing program, spreadsheet program, etc. (hereinafter called "word processor"), for executing address handling therein.

Accordingly, in a word processor, the button is added and a user types information, such as an addressee's name, or a part of the name, etc. in a document created with the word processor, such as a letter, fax, etc., and then clicks, selects, commands, etc. the button via the appropriate input device, such as a touch screen button, keyboard button, icon, menu choice, voice command device, etc. A program then executes and retrieves the typed information from the document, and searches an information management source, such as a database, file, database program, contact management program, etc. (hereinafter called "database") to determine if the information, such as the name or part of the name typed and searched by the program exists in the database. If the program does not find stored information, such as a name, corresponding to the name or part of the name typed, the user is asked by the program whether the information, such as the name that was not found, should be added to the database. In addition, the user may enter any other information besides the name, such as addresses, businesses, telephone numbers, fax numbers, e-mail address, etc., so that this other information can be stored in the database for later use.

If the program finds name(s) and address(es) corresponding to the part of the addressee's name typed, this additional information is automatically entered into the user's word processor, optionally with a confirmation from the user that this is the correct data. If the typed address information does

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not correspond to data already stored in the database, after clicking on the button, the program, for example, lets the user decide: (1) if this is new data (e.g., a new address) for an existing contact; (2) if the stored data should be changed to what the user just typed; (3) if this is a new contact with the same name as the one already entered into the database; or (4) if the typed address is only to be used once, and therefore not to be stored in the database at all. If, later, for example, a name with several address stored in the database is recalled all addresses for this contact will be displayed, so that the correct address can be selected by the user.

The program may be extended to also store and retrieve other information, such as telephone numbers, fax numbers, e-mail addresses, etc. Once the program recalls the telephone numbers, fax numbers, email addresses, etc., the user can command the program to send e-mails, faxes, etc. Similarly, if the user types in the name of a mailing list, the program create merge letters, group emails, etc.

Referring now to the drawings, wherein like reference numerals designate identical or corresponding parts throughout the several views, and more particularly to FIGS. 1 and 2 thereof, there is illustrated flow charts of single button addressing, according to exemplary embodiments of the present invention.

In FIG. 1, after the user has inserted the address in the word processor, the user commands the button at step 2 and the program analyzes what the user has typed in the document at step 4. At step 6, the program decides what was found in the document and if the program found nothing in the document or what it found was un-interpretable the program goes to step 8 and outputs an appropriate message to the user and then quits at step 16. The program analyzes what the user has typed in the document at step 4, for example, by analyzing (i) paragraph/line separations/formatting, etc.; (ii) street, avenue, drive, lane, boulevard, city, state, zip code, country designators and abbreviations, etc.; (iii) Mr., Mrs., Sir, Madam, Jr., Sr. designators and abbreviations, etc.; (iv) Inc., Ltd., P.C., L.L.C, designators and abbreviations, etc.; and (v) a database of common male/female names, etc.

If the program find an e-mail address mailing list/category name telephone number or other information, at step 10 an appropriate action is performed by the program and then the program execution quits at step 16. If the program only finds a name or initials, or the like, the program looks up the name in the database at step 12 and at step 18 the program determines what was found. If the program finds more than one possible contact/address match, at step 20 the program displays menu choices to the user to let him choose an appropriate answer. Then at step 22 the program inserts a correct address and name in the document and then at step 16 the program quits execution. If the program finds one match exactly, i.e., one contact with one address, the program inserts the correct address and name in the document at step 22 then quits and then quits execution at step 16. If the program does not find a name in the database, at step 24 the program prompts the user to specify an address and then quits execution at step 16. If the program at step 6 finds a name and an address, at step 14 the name is looked up in the database. Then, at step 26, if no match is found, at step 28 the program inserts an address and a name which are possibly corrected by the user into the database and then quits execution at step 16. If at step 26, the name and address is found, at step 32 the program either takes no action or displays the data for the user to edit. If at step 26, the name is found but not the address, the program prompts the user for a decision at step 30. If the user decides that this is another contact with a same name, the program goes to step 28. If the user decides that this is a one

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time occurrence, no action is taken and the program quits at step 16. If the user decides that the contact has, for example, moved and that this is a new address, at step 34 one of the old addresses for the contact is replaced with the new one and the program quits at step 16. If the user decides that this is an additional address for the contact, at step 36 the additional address is inserted into the database for that contact and execution quits at step 16.

The flowchart shown in FIG. 2 is similar to the flowchart in FIG. 1, except for some additional steps which will now be discussed. At step 6, if the program only finds a name or a similar name then the name is looked up in the database at step 12, then at step 18 if the program found more than one possible contact/address match, the program displays choices to the user to let him choose an address at step 20. Then at step 21 the user decides whether to insert the selected address into the document. If the user does not decide to select the address into the document the program quits execution at step 16. If the user decides to insert the selected address into the document the program inserts the address and name into the document at step 22 and then quits at step 16.

If the program finds a name and address in the database at step 6, then at step 14 the program looks up the name in the database and at step 26 the program determines what it has found. If the program does not find the name at step 26, at step 27 the program prompts the user for a decision and review and whether to insert the contact and address. If the user does not decide to insert the contact address, the program quits at step 16. If the user decides to insert the contact address, at step 28 the program inserts the address and name which may be possibly corrected by the user for program in the database then execution quits at step 16.

If at step 26 the program finds a name and not an address, then at step 29 the name is looked up in the database. Then at step 31 the program decides whether this contact has another address. If the contact does not have another address, at step 33 the program prompts the user for a decision and review and whether to add the address. If the user does not want to add the address at step 33, the program quits at step 16. If the user wants to add the address at step 33 because this is an additional address for the contact, at step 36 the address is inserted in the database for the contact and execution quits at step 16.

At step 30, if the user decides that this is another contact with the same name, then the program goes to step 28. If at step 30 the user decides that this is a one time occurrence, then the program quits at step 16. If at step 30, the user decides that the contact has, for example, moved, the program goes to step 34. If at step 30, the user decides that this is an additional address for the contact, at step 36 the program inserts the address in the database for the contact and then quits at step 16.

Various exemplary screen shots which are generated during execution of the program, according to the present invention, will now be described with reference to FIGS. 3-15 and examples 1-7 as follows.

Example 1

Retrieving an Existing Address from the Database

FIG. 3 illustrates a starting point in word processor document such as WORD document, wherein the user has typed a name 40. The user hits the button 42, for example, marked "OneButton" and the program according to the present invention retrieves the name 40 from the document, searches a

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database for the name 40, and inserts the retrieved address 44 associated with the name 40 into the document as shown in, for example, FIG. 4.

The above example corresponds to steps 2, 4, 6, 12, 18, 22 and 16 in the flow charts of FIGS. 1 and 2.

Example 2

Adding a New Contact to the Database

FIG. 5 illustrates a starting point in word processor document such as WORD document, wherein the user has typed a name and address of a new contact 46. The user commands the button 42; for example, marked "OneButton," and the program according to the invention retrieves the new contact 46 from the document, searches a database for the name of the new contact 46 and generates a screen as shown in, for example, FIG. 6. This screen includes a message 50 informing the user that the new contact does not exist in the database, a message 52 including the address retrieved from the document, an address type selection 54, such as home, business, etc., and "OK," "Details," and "Cancel" buttons 56, 58, and 60, respectively.

At this point, the user can cancel the operation by commanding the Cancel button 60, ask the program to store data in the database and return the document by commanding the OK button 56, or check details before storing data into the database by commanding the Details button 58. If the user commands the Details button 58, as shown in, for example, FIG. 7, a message screen is provided so that the user can review and edit data 62 and the selection 54, store the data 62 and 54 in the database by commanding a "Add and Choose" button 64, see more options by commanding an "Options" button 66, or cancel the operation by commanding the Cancel button 60.

The above example corresponds to steps 2, 4, 6, 14, 26, 28 and 16 in the flow chart of FIG. 1 and steps 2, 4, 6, 14, 26, 27, 28 and 16 in the flow chart of FIG. 1 and steps 2, 4, 6, 26, 27, 28 and 16 in the flow chart of FIG. 2.

Example 3

Try to Retrieve Existing Address, but Contact is not in Database

FIG. 3 illustrates a starting point in word processor document, such as WORD document, wherein the user has typed a name of a contact 40. The user commands the button 42, for example, marked "OneButton," and the program according to the present invention retrieves the name 40 from the document, searches a database for the name of the contact 40 and generates a screen as shown in, for example, FIG. 8. This screen includes a message 68 informing the user that the contact does not exist in the database and to specify an address, and "OK" buttons 56. At this point when the user commands the OK button 56, the user returns to the document so that the contact's address can be included as in Example 2 above.

The above example corresponds to steps 2, 4, 6, 12, 18, 24, and 16 in the flow of charts of FIGS. 1 and 2.

Example 4

Adding a New Address for an Existing Contact (Short Version)

FIG. 4 illustrates a starting point in word processor document, such as WORD document, wherein the user has typed

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a name and new address of an existing contact **44**. The user commands the button **42**, for example, marked “OneButton,” and the program according to the present invention retrieves the existing contact **44** from the document, searches a database for the same name of the existing contact **44** and generates a screen as shown in, for example, FIG. **9**. This screen includes a message **70** informing the user that the contact already exists in the database with an existing address, a message **72** including the existing address, add new contact with same name selection **74**, change existing address selection **76**, use existing address in document selection **78**, add the new address contact selection **80**, the address type selection **54**, such as home, business, etc., and the “OK,” “Details,” and “Cancel” buttons **56**, **58** and **60** respectively. At this point, the user may select one of the four options **74-80**, and command the OK button **56** to execute the selected options. The user can also cancel the operation by commanding the Cancel button **60**, or check details before storing data into the database by commanding the Details button **58**.

The above example corresponds to steps **2, 4, 6, 14, 26, 28, 30, 34, 36, and 16** in the flow chart of FIG. **1** and steps **2, 4, 6, 14, 26, 29, 31, 30, 28, 34, 36, and 16** in the flow chart of FIG. **2**.

Example 5

Selecting Between Several Possible Matching Addresses

FIG. **3** illustrates a starting point in word processor document, such as WORD document, wherein the user has typed a name and possibly address of at least one existing contact **40**. The user commands the button **42**, for example, marked “OneButton,” and the program according to the present invention retrieves the existing contact **40** from the document, searches a database for the name of the existing contact **40** and generates a screen as shown in, for example, FIG. **10**. This screen includes a message informing the user the name corresponds to several addresses and possible contacts which already exist in the database, with existing contacts and addresses for selection **82**, a message **84** including the full name and address for the contact that the user selects in **82**; the Options button **66**, a “Choose” button **86**, a “Full details” button **88**, a “More >>>” button **90**, and the Cancel button **60**. The above screen indicates to the user that at least one contact with the same name exists, and that there are more than one addresses and/or contacts that match.

At this point the user may command the Choose button **86** to use the selected address and return to the document, or the user may command the More >>> button **90** to view how the program interpreted what the user typed in the word processor, and possibly change this data, wherein the program generates an updated screen as shown in, for example, FIG. **11**. The updated screen includes the data **62** which displays the name typed in the word processor as interpreted by the program, address fields, and the fields for the address type selection **54**, such as home, business, etc., which may be changed by the user before the program stores it in the database, the Add and Choose button **64**, a “<<<< Less” button **90** corresponding to the More >>> button **90** for returning to the screen of FIG. **10**, and an “Add this address to the selected contact above” button **92**. The user might then command the Add this address to the selected contact above button **92** and the result in the word processor is illustrated in FIG. **4**. The user can also cancel the operations by commanding the Cancel button **60**, or command the add choose button **64** to add this name and address as a new contact and address, or open

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the database before storing data into the database by commanding a “Full details” button **88** as will be later described.

The above example corresponds to steps **2, 4, 6, 12, 18, 20, 22, and 16** in the flow chart of FIG. **1** and steps **2, 4, 6, 12, 18, 20, 21, 22, and 16** in the flow chart of FIG. **2**.

Example 6

Adding a New Address for an Existing Contact (Long Version)

FIG. **4** illustrates a starting point in word processor document, such as WORD document, wherein the user has typed a name and new address of an existing contact **44**. The user commands the button **42**, for example, marked “OneButton,” and the program according to the present invention retrieves the existing contact **44** from the document, searches a database for the name of the existing contact **44** and generates a screen as shown in, for example, FIG. **9**. As previously described the screen includes a message **70** informing the user that the contact already exists in the database with an existing address, and the user may command the Details button **58** to see the details of the new address for potentially modify the details before they are stored in the database and the program generates a screen as shown in, for example, FIG. **10**. From this screen, the user may choose to use another address than the one he typed, and return to the document, or the user may command the “Full details” button **88** to enter a database program, such as OUTLOOK™, directly as shown in, for example, FIG. **12**. In FIG. **12**, the database program, such as OUTLOOK™, may include portions **94-104** for allowing the user to modify various pieces of data before they are stored in the database.

Alternatively, in the screen shown in FIG. **10**, the user may command the More >>> button **90** at which time the program generates the screen as shown in, for example, FIG. **11** and as previously described. In this screen, the user might then command the Add this address to the selected contact above button **92**. If the address typed is already in use, the program generates a screen including a message **106**, and “Yes” and “No” buttons, **108** and **110**, respectively, as shown in, for example, FIG. **13**. If the user hits the Yes button **108** the program overwrites the contact address with the address specified by the user (e.g., if the contact has moved) and the result in the word processor is shown in, for example FIG. **4**.

The above example corresponds to steps **2, 4, 6, 12, 14, 26, 28, 30, 34, 36, and 16** in the flow chart of FIG. **1** and steps **2, 4, 6, 12, 14, 26, 29, 31, 30, 28, 34, 36, and 16** in the flow chart of FIG. **2**.

Example 7

Spreadsheet Application

FIG. **14** illustrates a starting point in word processor document, such as an EXCEL spreadsheet, wherein the user has typed a name **112**. The user hits the button **42**, for example, marked “OneButton,” and the program according to the present invention retrieves the name **112** from the spreadsheet, searches a database for the name **112**, and inserts the retrieved address **114** into the spreadsheet as shown in, for example, FIG. **15**. Accordingly, the examples 1-6 apply not only to word processor documents, such as WORD™ documents, etc., but to other word processor documents, and spreadsheets, such as EXCEL™ spreadsheets, etc.

The above example corresponds to steps **2, 4, 12, 18, 22, and 16** in the flow of charts FIGS. **1** and **2**.

FIG. 16 is a schematic illustration of a computer system for implementing the single button addressing according to the present invention. A computer 200 implements the method of the present invention, wherein the computer includes, for example, a display device 202, such as a conventional display device or a touch screen monitor with a touch screen interface, etc., a keyboard 204, a pointing device 206, a mouse pad or digitizing pad 208, a hard disk 210, or other fixed, high density media drives, connected using an appropriate device bus (e.g., a SCSI bus, an Ultra DMA bus, a PCI bus, etc.), a floppy drive 212, a tape or CD ROM drive 214 with tape or CD media 216, or other removable media devices, such as magneto-optical media, etc., and a mother board 218. The mother board 218 includes, for example, a processor 220, a RAM 222, and ROM 224 (e.g., DRAM, ROM, EPROM, EEPROM, SRAM, SDRAM, and Flash RAM, etc.), I/O ports 226 which may be used to couple to external devices, networks, etc., (not shown), and optional special purpose logic devices (e.g., ASICs) or configurable logic devices (e.g., GAL and re-programmable FPGA) 228 for performing specialized hardware/software functions, such as sound processing, image processing, signal processing, neural network processing, object character recognition (OCR) processing, etc., a microphone 230, and a speaker or speakers 232.

As stated above, the system includes at least one computer readable medium or alternatively, the computer readable medium may be accessed through various paths, such as networks, internet, drives, etc. Examples of computer readable media are compact discs, hard disks, floppy disks, tape, magneto-optical disks, PROMs (EPROM, EEPROM, Flash, EPROM), DRAM, SRAM, SDRAM, etc. Stored on any one or on a combination of computer readable media, the present invention includes software for controlling both the hardware of the computer 200 and for enabling the computer 200 to interact with a human user. Such software may include, but is not limited to, device drivers, operating systems and user applications, such as development tools. Such computer readable media further includes the computer program product of the present invention for performing any of the processes according to the present invention, described above (see, e.g., FIGS. 1-15). The computer code devices of the present invention can be any interpreted or executable code mechanism, including but not limited to scripts, interpreters, dynamic link libraries, Java classes, and complete executable programs, etc.

The invention may also be implemented by the preparation of application specific integrated circuits or by interconnecting an appropriate network of conventional component circuits, as will be readily apparent to those skilled in the art.

Address handling, according to this invention; is a significant simplification relative to existing methods, and requires little or no training on the part of a user, as correct addresses are retrieved with a minimal number of user commands, "clicks," keystrokes, etc. In addition, a program according to the present invention, can be programmed and created in most existing programming languages and be connected to most modern word processors. Therefore, according to the present invention, the process of creating and updating records in an address database is significantly simplified, since this may now be performed directly from the word processor.

Although the present invention is defined in terms of word processing documents, such as WORD™ documents and EXCEL™ spreadsheets, the present invention is applicable to all types of word processing documents such as NOTEPAD™, WORDPAD™, WORDPERFECT™, QUATROPRO™, AMIPRO™, etc., as will be readily apparent to those skilled in the art.

Although the present invention is defined in terms of information management or database programs, such as OUTLOOK™ etc., the present invention is applicable to all types of information management or database programs such as ACCESS™, ORACLE™, DBASE™, RBASE™, CARD-FILE™, including "flat files," etc., as will be readily apparent to those skilled in the art.

Although the present invention is defined in terms of providing an input device, such as a button 42 in a word processor for address handling therein, the present invention may be practiced with all types of input devices, such as touch screen, keyboard button, icon, menu, voice command device, etc., as will be readily apparent to those skilled in the art.

Although the present invention is defined in terms of a program retrieving information from a document before searching a database, the user may select the information in the document to be searched by the program in the database (e.g., by highlighting, selecting, italicizing, underlining, etc.), as will be readily apparent to those skilled in the art.

Although the present invention is defined in terms of a program retrieving a name or portion thereof from a document before searching a database the program may retrieve an address or portion thereof from the document before searching the database and insert, correct, complete, etc., the retrieved address based on the information found in the database corresponding to the retrieved address or portion thereof, as will be readily apparent to those skilled in the art.

Obviously, numerous modifications and variations of the present invention are possible in light of the above teachings. It is therefore to be understood that within the scope of appended claims, the invention may be practiced otherwise than as specifically described herein.

This application claims priority and contains subject matter related to Norwegian patent application No. 984066 filed on Sep. 3, 1998, the entire contents of which are hereby incorporated by reference.

What is claimed is:

1. A computer-implemented method for finding data related to the contents of a document using a first computer program running on a computer, the method comprising:
 - displaying the document electronically using the first computer program;
 - while the document is being displayed, analyzing, in a computer process, first information from the document to determine if the first information is at least one of a plurality of types of information that can be searched for in order to find second information related to the first information;
 - retrieving the first information;
 - providing an input device, configured by the first computer program, that allows a user to enter a user command to initiate an operation, the operation comprising (i) performing a search using at least part of the first information as a search term in order to find the second information, of a specific type or types, associated with the search term in an information source external to the document, wherein the specific type or types of second information is dependent at least in part on the type or types of the first information, and (ii) performing an action using at least part of the second information;
 - in consequence of receipt by the first computer program of the user command from the input device, causing a search for the search term in the information source, using a second computer program, in order to find second information related to the search term; and
 - if searching finds any second information related to the search term, performing the action using at least part of

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the second information, wherein the action is of a type depending at least in part on the type or types of the first information.

2. A method according to claim 1, wherein the first information comprises at least one of name-, person-, company- and address-related information.

3. A method according to claim 2, wherein performing the action includes performing the action in the first computer program.

4. A method according to claim 1, wherein performing the action includes performing the action in the first computer program.

5. A method according to claim 4, wherein performing the action includes causing addition of at least part of the second information to the first information in the document.

6. A method according to claim 4, wherein performing the action includes causing display of at least part of the second information.

7. A method according to claim 4, wherein performing the action includes causing display of at least part of the second information by the first computer program.

8. A method according to claim 1, further comprising, providing a prompt for updating the information source to include the first information.

9. A method according to claim 1, further comprising, if the search is not successful, providing a prompt for updating the information source to include the first information.

10. A method according to claim 1, wherein receipt by the first computer program of the user command precedes analyzing the document.

11. A method according to claim 1, wherein analyzing the document is completed after the receipt of the user command is completed and before searching is initiated.

12. A method according to claim 1, wherein the input device is a graphical input device.

13. A method according to claim 1, wherein the user command is the only command from a user necessary to initiate performing the operation.

14. A method according to claim 1, wherein the input device is a menu and the entry of the user command includes a user's selection of the menu and click on a menu choice from the menu.

15. A method according to claim 1, further comprising, if searching results in a plurality of distinct instances of second information, displaying such instances to enable user selection of one of them for use in performing the action.

16. A method according to claim 1, wherein the information source is associated with the second computer program and is available on the computer.

17. A method according to claim 1, wherein the information source is associated with the second computer program and is available through the computer.

18. A method according to claim 1, wherein performing the action includes causing insertion of at least part of the second information into the document.

19. A method according to claim 1, wherein performing the action includes causing insertion of at least part of the second information into the document by the first computer program.

20. A computer-implemented method for finding data related to the contents of a document using a first computer program running on a computer, the method comprising:

displaying the document electronically using the first computer program;

while the document is being displayed, analyzing, in a computer process on the computer, first information from the document to determine if the first information is at least one of a plurality of types of information that

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can be searched for in order to find second information related to the first information, and wherein the first information comprises at least one of name-, person-, company-, and address-related information;

providing an input device, configured by the first computer program, that allows a user to enter a user command to initiate an operation, the operation comprising (i) performing a search using at least part of the first information as a search term in order to find the second information, of a specific type or types, associated with the search term in a user editable information source outside the document, wherein the specific type or types of second information is dependent at least in part on the type or types of the first information, and (ii) performing an action using at least part of the second information, wherein the input device includes a menu;

retrieving the first information;

in consequence of receipt by the first computer program of the user command, such user command including a user's selection of the menu and click on a menu choice from the menu, causing a search for the search term in the user editable information source, using a second computer program, in order to find second information related to the search term in the user editable information source; and

if searching finds any second information related to the search term, performing the action using at least part of the second information, wherein the action is of a type depending at least in part on the type or types of the first information and performing the action includes at least causing display of at least part of the second information.

21. A method according to claim 20, further comprising, if searching results in a plurality of occurrences of second information, causing display of such instances to enable user selection of one of them for use in performing the action.

22. A method according to claim 20, wherein performing the action includes causing addition of at least part of the second information to the first information in the document.

23. At least one non-transitory computer readable medium encoded with instructions which, when loaded on a computer, establish processes for finding data related to the contents of a document using a first computer program running on a computer, the processes comprising:

displaying the document electronically using the first computer program;

while the document is being displayed, analyzing, in a computer process, first information from the document to determine if the first information is at least one of a plurality of types of information that can be searched for in order to find second information related to the first information;

retrieving the first information;

providing an input device, configured by the first computer program, that allows a user to enter a user command to initiate an operation, the operation comprising (i) performing a search using at least part of the first information as a search term in order to find the second information, of a specific type or types, associated with the search term in an information source external to the document, wherein the specific type or types of second information is dependent at least in part on the type or types of the first information, and (ii) performing an action using at least part of the second information;

in consequence of receipt by the first computer program of the user command from the input device, causing a search for the search term in the information source,

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using a second computer program, in order to find second information related to the search term; and if searching finds any second information related to the search term, performing the action using at least part of the second information, wherein the action is of a type depending at least in part on the type or types of the first information.

24. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein the first information comprises at least one of name-, person-, company- and address-related information.

25. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein performing the action includes performing the action in the first computer program.

26. At least one non-transitory computer readable medium according to claim 24, the instructions establishing processes wherein performing the action includes performing the action in the first computer program.

27. At least one non-transitory computer readable medium according to claim 25, the instructions establishing processes wherein performing the action includes causing addition of at least part of the second information to the first information in the document.

28. At least one non-transitory computer readable medium according to claim 25, the instructions establishing processes wherein performing the action includes causing display of at least part of the second information.

29. At least one non-transitory computer readable medium according to claim 25, the instructions establishing processes wherein performing the action includes causing display of at least part of the second information by the first computer program.

30. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes comprising:

providing a prompt for updating the information source to include the first information.

31. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes comprising:

if the search is not successful, providing a prompt for updating the information source to include the first information.

32. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein receipt by the first computer program of the user command precedes analyzing the document.

33. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein analyzing the document is completed after the receipt of the user command is completed and before searching is initiated.

34. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein the input device is a graphical input device.

35. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein the user command is the only command from a user necessary to initiate performing the operation.

36. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein the input device is a menu and the entry of the user command includes a user's selection of the menu and click on a menu choice from the menu.

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37. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes comprising:

if searching results in a plurality of distinct instances of second information, displaying such instances to enable user selection of one of them for use in performing the action.

38. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein the information source is associated with the second computer program and is available on the computer.

39. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein the information source is associated with the second computer program and is available through the computer.

40. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein performing the action includes causing insertion of at least part of the second information into the document.

41. At least one non-transitory computer readable medium according to claim 23, the instructions establishing processes wherein performing the action includes causing insertion of at least part of the second information into the document by the first computer program.

42. At least one non-transitory computer readable medium encoded with instructions which, when loaded on a computer, establish processes for finding data related to the contents of a document using a first computer program running on a computer, the processes comprising:

displaying the document electronically using the first computer program;

while the document is being displayed, analyzing, in a computer process on the computer, first information from the document to determine if the first information is at least one of a plurality of types of information that can be searched for in order to find second information related to the first information, and wherein the first information comprises at least one of name-, person-, company-, and address-related information;

providing an input device, configured by the first computer program, that allows a user to enter a user command to initiate an operation, the operation comprising (i) performing a search using at least part of the first information as a search term in order to find the second information, of a specific type or types, associated with the search term in a user editable information source outside the document, wherein the specific type or types of second information is dependent at least in part on the type or types of the first information, and (ii) performing an action using at least part of the second information, wherein the input device includes a menu;

retrieving the first information;

in consequence of receipt by the first computer program of the user command, such user command including a user's selection of the menu and click on a menu choice from the menu, causing a search for the search term in the user editable information source, using a second computer program, in order to find second information related to the search term in the user editable information source; and

if searching finds any second information related to the search term, performing the action using at least part of the second information, wherein the action is of a type depending at least in part on the type or types of the first information and performing the action includes at least causing display of at least part of the second information.

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43. At least one non-transitory computer readable medium according to claim 42, the instructions establishing processes comprising:
if searching results in a plurality of occurrences of second information, causing display of such instances to enable user selection of one of them for use in performing the action.

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44. At least one non-transitory computer readable medium according to claim 42, the instructions establishing processes wherein performing the action includes causing addition of at least part of the second information to the first information in the document.

* * * * *

EXHIBIT 2

**REDACTED IN ITS
ENTIRETY**

EXHIBIT 3

**REDACTED IN ITS
ENTIRETY**

EXHIBIT 4

Programming reference for the Win32 API

The Win32 API reference documentation is presented in several different views. You can browse a list of popular technologies on this page, or you can browse the full list of technologies in the table of contents. To browse all of the headers, see the list at the bottom of the table of contents.

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[Direct3D 11 Graphics](#)

[Direct3D 12 Graphics](#)

[DirectML](#)

[DXGI](#)

[Windows GDI](#)

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[GDI+](#)

[Windows Imaging Component](#)

Audio and video

 REFERENCE

[Microsoft Media Foundation](#)

[Windows Multimedia](#)

[XAudio2 APIs](#)

[Core Audio APIs](#)

[Audio Devices DDI Reference](#)

Data access and storage

 REFERENCE

[Data access and storage](#)

[Backup](#)

[Background Intelligent Transfer Service](#)

[Cloud Filter API](#)

[Data Exchange](#)

[Structured storage](#)

[Virtual Storage](#)

Devices

 REFERENCE

[Kernel-mode driver reference](#)

[Device and driver installation reference](#)

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[Display devices reference](#)

[Human Interface Devices reference](#)

[Print DDI reference](#)

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Networking and internet

REFERENCE

[Bluetooth](#)

[HTTP Server API](#)

[IP Helper](#)

[Network Management](#)

[Remote Procedure Call \(RPC\)](#)

[Windows HTTP Services \(WinHTTP\)](#)

[Windows Internet](#)

[Windows Sockets 2](#)

Security and identity

REFERENCE

[Security and identity](#)

[Network Access Protection](#)

[Network Policy Server](#)

[Parental controls](#)

[Windows Biometric Framework](#)

[TPM Base Services](#)

Diagnostics

REFERENCE

[Event tracing](#)

[Network Diagnostics Framework](#)

[Performance counters](#)

[Application Recovery and Restart](#)

[TraceLogging](#)

[Windows Event Collector](#)

[Windows Error Reporting](#)

Application installation

<https://docs.microsoft.com/en-us/windows/win32/api/>

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Programming reference for the Win32 API - Win32 apps | Microsoft Docs

 REFERENCE

[Application installation and servicing](#)

[Packaging and deployment Windows 10 apps](#)

[Developer licensing](#)

[Restart Manager](#)

System services

 REFERENCE

[Component Object Model \(COM\)](#)

[COM+ \(Component Services\)](#)

[Microsoft Interface Definition Language \(MIDL\)](#)

[Compression API](#)

EXHIBIT 5

```
1 /*
2  * Copyright (C) 2006 The Android Open Source Project
3  *
4  * Licensed under the Apache License, Version 2.0 (the "License");
5  * you may not use this file except in compliance with the License.
6  * You may obtain a copy of the License at
7  *
8  *     http://www.apache.org/licenses/LICENSE-2.0
9  *
10 * Unless required by applicable law or agreed to in writing, software
11 * distributed under the License is distributed on an "AS IS" BASIS,
12 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
... implied.
13 * See the License for the specific language governing permissions and
14 * limitations under the License.
15 */
16
17 package com.android.calendar;
18
19 import static android.provider.CalendarContract.EXTRA_EVENT_BEGIN_TIME;
20
21 import android.accounts.Account;
22 import android.app.Activity;
23 import android.app.SearchManager;
24 import android.content.BroadcastReceiver;
25 import android.content.ComponentName;
26 import android.content.ContentResolver;
27 import android.content.Context;
28 import android.content.Intent;
29 import android.content.IntentFilter;
30 import android.content.SharedPreferences;
31 import android.content.pm.PackageManager;
32 import android.content.res.Resources;
33 import android.database.Cursor;
34 import android.database.MatrixCursor;
35 import android.graphics.Color;
36 import android.graphics.drawable.Drawable;
37 import android.graphics.drawable.LayerDrawable;
38 import android.net.Uri;
39 import android.os.Build;
40 import android.os.Bundle;
41 import android.os.Handler;
42 import android.provider.CalendarContract.Calendars;
43 import android.text.Spannable;
44 import android.text.SpannableString;
45 import android.text.Spanned;
46 import android.text.TextUtils;
47 import android.text.format.DateFormat;
48 import android.text.format.DateUtils;
49 import android.text.format.Time;
```

```
50 import android.text.style.URLSpan;
51 import android.text.util.Linkify;
52 import android.util.Log;
53 import android.widget.SearchView;
54
55 import com.android.calendar.CalendarController.ViewType;
56 import com.android.calendar.CalendarEventModel.ReminderEntry;
57 import com.android.calendar.CalendarUtils.TimeZoneUtils;
58
59 import java.util.ArrayList;
60 import java.util.Arrays;
61 import java.util.Calendar;
62 import java.util.Formatter;
63 import java.util.HashMap;
64 import java.util.Iterator;
65 import java.util.LinkedHashSet;
66 import java.util.LinkedList;
67 import java.util.List;
68 import java.util.Locale;
69 import java.util.Map;
70 import java.util.Set;
71 import java.util.TimeZone;
72 import java.util.regex.Matcher;
73 import java.util.regex.Pattern;
74
75 public class Utils {
76     private static final boolean DEBUG = false;
77     private static final String TAG = "CalUtils";
78
79     // Set to 0 until we have UI to perform undo
80     public static final long UNDO_DELAY = 0;
81
82     // For recurring events which instances of the series are being
... modified
83     public static final int MODIFY_UNINITIALIZED = 0;
84     public static final int MODIFY_SELECTED = 1;
85     public static final int MODIFY_ALL_FOLLOWING = 2;
86     public static final int MODIFY_ALL = 3;
87
88     // When the edit event view finishes it passes back the appropriate
... exit
89     // code.
90     public static final int DONE_REVERT = 1 << 0;
91     public static final int DONE_SAVE = 1 << 1;
92     public static final int DONE_DELETE = 1 << 2;
93     // And should re run with DONE_EXIT if it should also leave the view,
... just
94     // exiting is identical to reverting
95     public static final int DONE_EXIT = 1 << 0;
96
```



```
97 public static final String OPEN_EMAIL_MARKER = "<";
98 public static final String CLOSE_EMAIL_MARKER = ">";
99
100 public static final String INTENT_KEY_DETAIL_VIEW = "DETAIL_VIEW";
101 public static final String INTENT_KEY_VIEW_TYPE = "VIEW";
102 public static final String INTENT_VALUE_VIEW_TYPE_DAY = "DAY";
103 public static final String INTENT_KEY_HOME = "KEY_HOME";
104
105 public static final int MONDAY_BEFORE_JULIAN_EPOCH =
... Time.EPOCH_JULIAN_DAY - 3;
106 public static final int DECLINED_EVENT_ALPHA = 0x66;
107 public static final int DECLINED_EVENT_TEXT_ALPHA = 0xC0;
108
109 private static final float SATURATION_ADJUST = 1.3f;
110 private static final float INTENSITY_ADJUST = 0.8f;
111
112 // Defines used by the DNA generation code
113 static final int DAY_IN_MINUTES = 60 * 24;
114 static final int WEEK_IN_MINUTES = DAY_IN_MINUTES * 7;
115 // The work day is being counted as 6am to 8pm
116 static int WORK_DAY_MINUTES = 14 * 60;
117 static int WORK_DAY_START_MINUTES = 6 * 60;
118 static int WORK_DAY_END_MINUTES = 20 * 60;
119 static int WORK_DAY_END_LENGTH = (24 * 60) - WORK_DAY_END_MINUTES;
120 static int CONFLICT_COLOR = 0xFF000000;
121 static boolean mMinutesLoaded = false;
122
123 public static final int YEAR_MIN = 1970;
124 public static final int YEAR_MAX = 2036;
125
126 // The name of the shared preferences file. This name must be
... maintained for
127 // historical
128 // reasons, as it's what PreferenceManager assigned the first time
... the file
129 // was created.
130 static final String SHARED_PREFS_NAME =
... "com.android.calendar_preferences";
131
132 public static final String KEY_QUICK_RESPONSES =
... "preferences_quick_responses";
133
134 public static final String KEY_ALERTS_VIBRATE_WHEN =
... "preferences_alerts_vibrateWhen";
135
136 public static final String APPWIDGET_DATA_TYPE =
... "vnd.android.data/update";
137
138 static final String MACHINE_GENERATED_ADDRESS =
... "calendar.google.com";
```

```
139
140     private static final TimeZoneUtils mTZUtils = new
... TimeZoneUtils(SHARED_PREFS_NAME);
141     private static boolean mAllowWeekForDetailView = false;
142     private static long mTardis = 0;
143     private static String sVersion = null;
144
145     private static final Pattern mWildcardPattern =
... Pattern.compile("^.*$");
146
147     /**
148     * A coordinate must be of the following form for Google Maps to
... correctly use it:
149     * Latitude, Longitude
150     *
151     * This may be in decimal form:
152     * Latitude: {-90 to 90}
153     * Longitude: {-180 to 180}
154     *
155     * Or, in degrees, minutes, and seconds:
156     * Latitude: {-90 to 90}° {0 to 59}' {0 to 59}"
157     * Longitude: {-180 to 180}° {0 to 59}' {0 to 59}"
158     * + or - degrees may also be represented with N or n, S or s for
... latitude, and with
159     * E or e, W or w for longitude, where the direction may either
... precede or follow the value.
160     *
161     * Some examples of coordinates that will be accepted by the regex:
162     * 37.422081°, -122.084576°
163     * 37.422081,-122.084576
164     * +37°25'19.49", -122°5'4.47"
165     * 37°25'19.49"N, 122°5'4.47"W
166     * N 37° 25' 19.49", W 122° 5' 4.47"
167     **/
168     private static final String COORD_DEGREES_LATITUDE =
169         "([-+NnSs]" + "\\s)*?"
170         + "[1-9]?[0-9](\\u00B0)" + "\\s)*"
171         + "([1-5]?[0-9]\\')?" + "\\s)*"
172         + "([1-5]?[0-9]" + "\\.[0-9+)?\\")?"
173         + "\\s)*" + "[NnSs])?";
174     private static final String COORD_DEGREES_LONGITUDE =
175         "([-+EeWw]" + "\\s)*?"
176         + "(1)?[0-9]?[0-9](\\u00B0)" + "\\s)*"
177         + "([1-5]?[0-9]\\')?" + "\\s)*"
178         + "([1-5]?[0-9]" + "\\.[0-9+)?\\")?"
179         + "\\s)*" + "[EeWw])?";
180     private static final String COORD_DEGREES_PATTERN =
181         COORD_DEGREES_LATITUDE
182         + "\\s)*" + "," + "\\s)*"
183         + COORD_DEGREES_LONGITUDE;
```

```
184 private static final String COORD_DECIMAL_LATITUDE =
185     "[+-]?"
186     + "[1-9]?[0-9]" + "(\\. [0-9]+)"
187     + "(\\u00B0)?";
188 private static final String COORD_DECIMAL_LONGITUDE =
189     "[+-]?"
190     + "(1)?[0-9]?[0-9]" + "(\\. [0-9]+)"
191     + "(\\u00B0)?";
192 private static final String COORD_DECIMAL_PATTERN =
193     COORD_DECIMAL_LATITUDE
194     + "(\\s)*" + "," + "(\\s)*"
195     + COORD_DECIMAL_LONGITUDE;
196 private static final Pattern COORD_PATTERN =
197     Pattern.compile(COORD_DEGREES_PATTERN + "|" +
... COORD_DECIMAL_PATTERN);
198
199 private static final String NANP_ALLOWED_SYMBOLS = "()+-*#.";
200 private static final int NANP_MIN_DIGITS = 7;
201 private static final int NANP_MAX_DIGITS = 11;
202
203
204 /**
205  * Returns whether the SDK is the Jellybean release or later.
206  */
207 public static boolean isJellybeanOrLater() {
208     return Build.VERSION.SDK_INT >= Build.VERSION_CODES.JELLY_BEAN;
209 }
210
211 /**
212  * Returns whether the SDK is the KeyLimePie release or later.
213  */
214 public static boolean isKeyLimePieOrLater() {
215     return Build.VERSION.SDK_INT >= Build.VERSION_CODES.KITKAT;
216 }
217
218 public static int getViewTypeFromIntentAndSharedPref(Activity
... activity) {
219     Intent intent = activity.getIntent();
220     Bundle extras = intent.getExtras();
221     SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(activity);
222
223     if (TextUtils.equals(intent.getAction(), Intent.ACTION_EDIT)) {
224         return ViewType.EDIT;
225     }
226     if (extras != null) {
227         if (extras.getBoolean(INTENT_KEY_DETAIL_VIEW, false)) {
228             // This is the "detail" view which is either agenda or
... day view
229             return prefs.getInt(GeneralPreferences.KEY_DETAILED_VIEW,
```

```
230     GeneralPreferences.DEFAULT_DETAILED_VIEW);
231     } else if
... (INTENT_VALUE_VIEW_TYPE_DAY.equals(extras.getString(INTENT_KEY_VIEW_TYPE)
... )) {
232         // Not sure who uses this. This logic came from
... LaunchActivity
233         return ViewType.DAY;
234     }
235 }
236
237     // Default to the last view
238     return prefs.getInt(
239         GeneralPreferences.KEY_START_VIEW,
... GeneralPreferences.DEFAULT_START_VIEW);
240 }
241
242 /**
243  * Gets the intent action for telling the widget to update.
244  */
245 public static String getWidgetUpdateAction(Context context) {
246     return context.getPackageName() + ".APPWIDGET_UPDATE";
247 }
248
249 /**
250  * Gets the intent action for telling the widget to update.
251  */
252 public static String getWidgetScheduledUpdateAction(Context context)
... {
253     return context.getPackageName() + ".APPWIDGET_SCHEDULED_UPDATE";
254 }
255
256 /**
257  * Gets the intent action for telling the widget to update.
258  */
259 public static String getSearchAuthority(Context context) {
260     return context.getPackageName() +
... ".CalendarRecentSuggestionsProvider";
261 }
262
263 /**
264  * Writes a new home time zone to the db. Updates the home time zone
... in the
265  * db asynchronously and updates the local cache. Sending a time zone
... of
266  * **tbd** will cause it to be set to the device's time zone. null or
... empty
267  * tz will be ignored.
268  *
269  * @param context The calling activity
270  * @param timeZone The time zone to set Calendar to, or **tbd**
```

```
271 */
272 public static void setTimeZone(Context context, String timeZone) {
273     mTZUtils.setTimeZone(context, timeZone);
274 }
275
276 /**
277  * Gets the time zone that Calendar should be displayed in This is a
... helper
278  * method to get the appropriate time zone for Calendar. If this is
... the
279  * first time this method has been called it will initiate an
... asynchronous
280  * query to verify that the data in preferences is correct. The
... callback
281  * supplied will only be called if this query returns a value other
... than
282  * what is stored in preferences and should cause the calling
... activity to
283  * refresh anything that depends on calling this method.
284  *
285  * @param context The calling activity
286  * @param callback The runnable that should execute if a query
... returns new
287  *         values
288  * @return The string value representing the time zone Calendar
... should
289  *         display
290  */
291 public static String getTimeZone(Context context, Runnable callback)
... {
292     return mTZUtils.getTimeZone(context, callback);
293 }
294
295 /**
296  * Formats a date or a time range according to the local conventions.
297  *
298  * @param context the context is required only if the time is shown
299  * @param startMillis the start time in UTC milliseconds
300  * @param endMillis the end time in UTC milliseconds
301  * @param flags a bit mask of options See {@link
... DateUtils#formatDateRange(Context, Formatter,
302  * long, long, int, String) formatDateRange}
303  * @return a string containing the formatted date/time range.
304  */
305 public static String formatDateRange(
306     Context context, long startMillis, long endMillis, int flags)
... {
307     return mTZUtils.formatDateRange(context, startMillis, endMillis,
... flags);
308 }
```

```
309
310     public static boolean getDefaultVibrate(Context context,
... SharedPreferences prefs) {
311         boolean vibrate;
312         if (prefs.contains(KEY_ALERTS_VIBRATE_WHEN)) {
313             // Migrate setting to new 4.2 behavior
314             //
315             // silent and never -> off
316             // always -> on
317             String vibrateWhen = prefs.getString(KEY_ALERTS_VIBRATE_WHEN,
... null);
318             vibrate = vibrateWhen != null && vibrateWhen.equals(context
319 ... .getString(R.string.prefDefault_alerts_vibrate_true));
320             prefs.edit().remove(KEY_ALERTS_VIBRATE_WHEN).commit();
321             Log.d(TAG, "Migrating KEY_ALERTS_VIBRATE_WHEN(" + vibrateWhen
322                 + ") to KEY_ALERTS_VIBRATE = " + vibrate);
323         } else {
324             vibrate =
... prefs.getBoolean(GeneralPreferences.KEY_ALERTS_VIBRATE,
325                 false);
326         }
327         return vibrate;
328     }
329
330     public static String[] getSharedPreference(Context context, String
... key, String[] defaultValue) {
331         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
332         Set<String> ss = prefs.getStringSet(key, null);
333         if (ss != null) {
334             String strings[] = new String[ss.size()];
335             return ss.toArray(strings);
336         }
337         return defaultValue;
338     }
339
340     public static String getSharedPreference(Context context, String key,
... String defaultValue) {
341         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
342         return prefs.getString(key, defaultValue);
343     }
344
345     public static int getSharedPreference(Context context, String key,
... int defaultValue) {
346         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
347         return prefs.getInt(key, defaultValue);
348     }
```

```
349
350     public static boolean getSharedPreference(Context context, String
... key, boolean defaultValue) {
351         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
352         return prefs.getBoolean(key, defaultValue);
353     }
354
355     /**
356     * Asynchronously sets the preference with the given key to the given
... value
357     *
358     * @param context the context to use to get preferences from
359     * @param key the key of the preference to set
360     * @param value the value to set
361     */
362     public static void setSharedPreference(Context context, String key,
... String value) {
363         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
364         prefs.edit().putString(key, value).apply();
365     }
366
367     public static void setSharedPreference(Context context, String key,
... String[] values) {
368         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
369         LinkedHashSet<String> set = new LinkedHashSet<String>();
370         for (String value : values) {
371             set.add(value);
372         }
373         prefs.edit().putStringSet(key, set).apply();
374     }
375
376     protected static void tardis() {
377         mTardis = System.currentTimeMillis();
378     }
379
380     protected static long getTardis() {
381         return mTardis;
382     }
383
384     public static void setSharedPreference(Context context, String key,
... boolean value) {
385         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
386         SharedPreferences.Editor editor = prefs.edit();
387         editor.putBoolean(key, value);
388         editor.apply();
389     }
```



```
390
391     static void setSharedPreference(Context context, String key, int
... value) {
392         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
393         SharedPreferences.Editor editor = prefs.edit();
394         editor.putInt(key, value);
395         editor.apply();
396     }
397
398     public static void removeSharedPreference(Context context, String
... key) {
399         SharedPreferences prefs = context.getSharedPreferences(
400             GeneralPreferences.SHARED_PREFS_NAME,
... Context.MODE_PRIVATE);
401         prefs.edit().remove(key).apply();
402     }
403
404     // The backed up ring tone preference should not used because it is a
... device
405     // specific Uri. The preference now lives in a separate non-backed-up
406     // shared_pref file (SHARED_PREFS_NAME_NO_BACKUP). The preference in
... the old
407     // backed-up shared_pref file (SHARED_PREFS_NAME) is used only to
... control the
408     // default value when the ringtone dialog opens up.
409     //
410     // At backup manager "restore" time (which should happen before
... launcher
411     // comes up for the first time), the value will be set/reset to
... default
412     // ringtone.
413     public static String getRingTonePreference(Context context) {
414         SharedPreferences prefs = context.getSharedPreferences(
415             GeneralPreferences.SHARED_PREFS_NAME_NO_BACKUP,
... Context.MODE_PRIVATE);
416         String ringtone =
... prefs.getString(GeneralPreferences.KEY_ALERTS_RINGTONE, null);
417
418         // If it hasn't been populated yet, that means new code is
... running for
419         // the first time and restore hasn't happened. Migrate value from
420         // backed-up shared_pref to non-shared_pref.
421         if (ringtone == null) {
422             // Read from the old place with a default of DEFAULT_RINGTONE
423             ringtone = getSharedPreference(context,
... GeneralPreferences.KEY_ALERTS_RINGTONE,
424                 GeneralPreferences.DEFAULT_RINGTONE);
425
426             // Write it to the new place
```

```
427         setRingTonePreference(context, ringtone);
428     }
429
430     return ringtone;
431 }
432
433     public static void setRingTonePreference(Context context, String
... value) {
434         SharedPreferences prefs = context.getSharedPreferences(
435             GeneralPreferences.SHARED_PREFS_NAME_NO_BACKUP,
... Context.MODE_PRIVATE);
436         prefs.edit().putString(GeneralPreferences.KEY_ALERTS_RINGTONE,
... value).apply();
437     }
438
439     /**
440     * Save default agenda/day/week/month view for next time
441     *
442     * @param context
443     * @param viewId {@link CalendarController.ViewType}
444     */
445     static void setDefaultView(Context context, int viewId) {
446         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
447         SharedPreferences.Editor editor = prefs.edit();
448
449         boolean validDetailView = false;
450         if (mAllowWeekForDetailView && viewId ==
... CalendarController.ViewType.WEEK) {
451             validDetailView = true;
452         } else {
453             validDetailView = viewId ==
... CalendarController.ViewType.AGENDA
454                 || viewId == CalendarController.ViewType.DAY;
455         }
456
457         if (validDetailView) {
458             // Record the detail start view
459             editor.putInt(GeneralPreferences.KEY_DETAILED_VIEW, viewId);
460         }
461
462         // Record the (new) start view
463         editor.putInt(GeneralPreferences.KEY_START_VIEW, viewId);
464         editor.apply();
465     }
466
467     public static MatrixCursor matrixCursorFromCursor(Cursor cursor) {
468         if (cursor == null) {
469             return null;
470         }

```

```
471     String[] columnNames = cursor.getColumnNames();
472     if (columnNames == null) {
473         columnNames = new String[] {};
474     }
475     MatrixCursor newCursor = new MatrixCursor(columnNames);
476     int numColumns = cursor.getColumnCount();
477     String data[] = new String[numColumns];
478     cursor.moveToPosition(-1);
479     while (cursor.moveToNext()) {
480         for (int i = 0; i < numColumns; i++) {
481             data[i] = cursor.getString(i);
482         }
483         newCursor.addRow(data);
484     }
485     return newCursor;
486 }
487
488
489 /**
490  * Compares two cursors to see if they contain the same data.
491  *
492  * @return Returns true if the cursors contain the same data and are
... not
493         *         null, false otherwise
494     */
495     public static boolean compareCursors(Cursor c1, Cursor c2) {
496         if (c1 == null || c2 == null) {
497             return false;
498         }
499
500         int numColumns = c1.getColumnCount();
501         if (numColumns != c2.getColumnCount()) {
502             return false;
503         }
504
505         if (c1.getCount() != c2.getCount()) {
506             return false;
507         }
508
509         c1.moveToPosition(-1);
510         c2.moveToPosition(-1);
511         while (c1.moveToNext() && c2.moveToNext()) {
512             for (int i = 0; i < numColumns; i++) {
513                 if (!TextUtils.equals(c1.getString(i), c2.getString(i)))
... {
514                 return false;
515             }
516         }
517     }
518
```

```
519     return true;
520 }
521
522 /**
523  * If the given intent specifies a time (in milliseconds since the
... epoch),
524  * then that time is returned. Otherwise, the current time is
... returned.
525  */
526 public static final long timeFromIntentInMillis(Intent intent) {
527     // If the time was specified, then use that. Otherwise, use the
... current
528     // time.
529     Uri data = intent.getData();
530     long millis = intent.getLongExtra(EXTRA_EVENT_BEGIN_TIME, -1);
531     if (millis == -1 && data != null && data.isHierarchical()) {
532         List<String> path = data.getPathSegments();
533         if (path.size() == 2 && path.get(0).equals("time")) {
534             try {
535                 millis = Long.valueOf(data.getLastPathSegment());
536             } catch (NumberFormatException e) {
537                 Log.i("Calendar", "timeFromIntentInMillis: Data
... existed but no valid time "
538                     + "found. Using current time.");
539             }
540         }
541     }
542     if (millis <= 0) {
543         millis = System.currentTimeMillis();
544     }
545     return millis;
546 }
547
548 /**
549  * Formats the given Time object so that it gives the month and year
... (for
550  * example, "September 2007").
551  *
552  * @param time the time to format
553  * @return the string containing the weekday and the date
554  */
555 public static String formatMonthYear(Context context, Time time) {
556     int flags = DateUtils.FORMAT_SHOW_DATE |
... DateUtils.FORMAT_NO_MONTH_DAY
557         | DateUtils.FORMAT_SHOW_YEAR;
558     long millis = time.toMillis(true);
559     return formatDateRange(context, millis, millis, flags);
560 }
561
562 /**
```

```

563 * Returns a list joined together by the provided delimiter, for
... example,
564 * ["a", "b", "c"] could be joined into "a,b,c"
565 *
566 * @param things the things to join together
567 * @param delim the delimiter to use
568 * @return a string contained the things joined together
569 */
570 public static String join(List<?> things, String delim) {
571     StringBuilder builder = new StringBuilder();
572     boolean first = true;
573     for (Object thing : things) {
574         if (first) {
575             first = false;
576         } else {
577             builder.append(delim);
578         }
579         builder.append(thing.toString());
580     }
581     return builder.toString();
582 }
583
584 /**
585 * Returns the week since {@link Time#EPOCH_JULIAN_DAY} (Jan 1, 1970)
586 * adjusted for first day of week.
587 *
588 * This takes a julian day and the week start day and calculates
... which
589 * week since {@link Time#EPOCH_JULIAN_DAY} that day occurs in,
... starting
590 * at 0. *Do not* use this to compute the ISO week number for the
... year.
591 *
592 * @param julianDay The julian day to calculate the week number for
593 * @param firstDayOfWeek Which week day is the first day of the week,
594 *     see {@link Time#SUNDAY}
595 * @return Weeks since the epoch
596 */
597 public static int getWeeksSinceEpochFromJulianDay(int julianDay, int
... firstDayOfWeek) {
598     int diff = Time.THURSDAY - firstDayOfWeek;
599     if (diff < 0) {
600         diff += 7;
601     }
602     int refDay = Time.EPOCH_JULIAN_DAY - diff;
603     return (julianDay - refDay) / 7;
604 }
605
606 /**
607 * Takes a number of weeks since the epoch and calculates the Julian

```

```

607... day of
608     * the Monday for that week.
609     *
610     * This assumes that the week containing the {@link
... Time#EPOCH_JULIAN_DAY}
611     * is considered week 0. It returns the Julian day for the Monday
612     * {@code week} weeks after the Monday of the week containing the
... epoch.
613     *
614     * @param week Number of weeks since the epoch
615     * @return The julian day for the Monday of the given week since the
... epoch
616     */
617     public static int getJulianMondayFromWeeksSinceEpoch(int week) {
618         return MONDAY_BEFORE_JULIAN_EPOCH + week * 7;
619     }
620
621     /**
622     * Get first day of week as android.text.format.Time constant.
623     *
624     * @return the first day of week in android.text.format.Time
625     */
626     public static int getFirstDayOfWeek(Context context) {
627         SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
628         String pref = prefs.getString(
629             GeneralPreferences.KEY_WEEK_START_DAY,
... GeneralPreferences.WEEK_START_DEFAULT);
630
631         int startDay;
632         if (GeneralPreferences.WEEK_START_DEFAULT.equals(pref)) {
633             startDay = Calendar.getInstance().getFirstDayOfWeek();
634         } else {
635             startDay = Integer.parseInt(pref);
636         }
637
638         if (startDay == Calendar.SATURDAY) {
639             return Time.SATURDAY;
640         } else if (startDay == Calendar.MONDAY) {
641             return Time.MONDAY;
642         } else {
643             return Time.SUNDAY;
644         }
645     }
646
647     /**
648     * Get first day of week as java.util.Calendar constant.
649     *
650     * @return the first day of week as a java.util.Calendar constant
651     */

```



```
652 public static int getFirstDayOfWeekAsCalendar(Context context) {
653     return
... convertDayOfWeekFromTimeToCalendar(getFirstDayOfWeek(context));
654 }
655
656 /**
657  * Converts the day of the week from android.text.format.Time to
... java.util.Calendar
658  */
659 public static int convertDayOfWeekFromTimeToCalendar(int
... timeDayOfWeek) {
660     switch (timeDayOfWeek) {
661         case Time.MONDAY:
662             return Calendar.MONDAY;
663         case Time.TUESDAY:
664             return Calendar.TUESDAY;
665         case Time.WEDNESDAY:
666             return Calendar.WEDNESDAY;
667         case Time.THURSDAY:
668             return Calendar.THURSDAY;
669         case Time.FRIDAY:
670             return Calendar.FRIDAY;
671         case Time.SATURDAY:
672             return Calendar.SATURDAY;
673         case Time.SUNDAY:
674             return Calendar.SUNDAY;
675         default:
676             throw new IllegalArgumentException("Argument must be
... between Time.SUNDAY and " +
677                 "Time.SATURDAY");
678     }
679 }
680
681 /**
682  * @return true when week number should be shown.
683  */
684 public static boolean getShowWeekNumber(Context context) {
685     final SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
686     return prefs.getBoolean(
687         GeneralPreferences.KEY_SHOW_WEEK_NUM,
... GeneralPreferences.DEFAULT_SHOW_WEEK_NUM);
688 }
689
690 /**
691  * @return true when declined events should be hidden.
692  */
693 public static boolean getHideDeclinedEvents(Context context) {
694     final SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
```

```
695     return prefs.getBoolean(GeneralPreferences.KEY_HIDE_DECLINED,
... false);
696 }
697
698     public static int getDaysPerWeek(Context context) {
699         final SharedPreferences prefs =
... GeneralPreferences.getSharedPreferences(context);
700         return prefs.getInt(GeneralPreferences.KEY_DAYS_PER_WEEK, 7);
701     }
702
703     /**
704      * Determine whether the column position is Saturday or not.
705      *
706      * @param column the column position
707      * @param firstDayOfWeek the first day of week in
... android.text.format.Time
708      * @return true if the column is Saturday position
709      */
710     public static boolean isSaturday(int column, int firstDayOfWeek) {
711         return (firstDayOfWeek == Time.SUNDAY && column == 6)
712             || (firstDayOfWeek == Time.MONDAY && column == 5)
713             || (firstDayOfWeek == Time.SATURDAY && column == 0);
714     }
715
716     /**
717      * Determine whether the column position is Sunday or not.
718      *
719      * @param column the column position
720      * @param firstDayOfWeek the first day of week in
... android.text.format.Time
721      * @return true if the column is Sunday position
722      */
723     public static boolean isSunday(int column, int firstDayOfWeek) {
724         return (firstDayOfWeek == Time.SUNDAY && column == 0)
725             || (firstDayOfWeek == Time.MONDAY && column == 6)
726             || (firstDayOfWeek == Time.SATURDAY && column == 1);
727     }
728
729     /**
730      * Convert given UTC time into current local time. This assumes it is
... for an
731      * allday event and will adjust the time to be on a midnight
... boundary.
732      *
733      * @param recycle Time object to recycle, otherwise null.
734      * @param utcTime Time to convert, in UTC.
735      * @param tz The time zone to convert this time to.
736      */
737     public static long convertAlldayUtcToLocal(Time recycle, long
... utcTime, String tz) {
```

```
738     if (recycle == null) {
739         recycle = new Time();
740     }
741     recycle.timezone = Time.TIMEZONE_UTC;
742     recycle.set(utcTime);
743     recycle.timezone = tz;
744     return recycle.normalize(true);
745 }
746
747 public static long convertAlldayLocalToUTC(Time recycle, long
... localTime, String tz) {
748     if (recycle == null) {
749         recycle = new Time();
750     }
751     recycle.timezone = tz;
752     recycle.set(localTime);
753     recycle.timezone = Time.TIMEZONE_UTC;
754     return recycle.normalize(true);
755 }
756
757 /**
758  * Finds and returns the next midnight after "theTime" in
... milliseconds UTC
759  *
760  * @param recycle - Time object to recycle, otherwise null.
761  * @param theTime - Time used for calculations (in UTC)
762  * @param tz The time zone to convert this time to.
763  */
764 public static long getNextMidnight(Time recycle, long theTime, String
... tz) {
765     if (recycle == null) {
766         recycle = new Time();
767     }
768     recycle.timezone = tz;
769     recycle.set(theTime);
770     recycle.monthDay ++;
771     recycle.hour = 0;
772     recycle.minute = 0;
773     recycle.second = 0;
774     return recycle.normalize(true);
775 }
776
777 /**
778  * Scan through a cursor of calendars and check if names are
... duplicated.
779  * This travels a cursor containing calendar display names and fills
... in the
780  * provided map with whether or not each name is repeated.
781  *
782  * @param isDuplicateName The map to put the duplicate check results
```

```
782... in.
783     * @param cursor The query of calendars to check
784     * @param nameIndex The column of the query that contains the display
... name
785     */
786     public static void checkForDuplicateNames(
787         Map<String, Boolean> isDuplicateName, Cursor cursor, int
... nameIndex) {
788         isDuplicateName.clear();
789         cursor.moveToPosition(-1);
790         while (cursor.moveToNext()) {
791             String displayName = cursor.getString(nameIndex);
792             // Set it to true if we've seen this name before, false
... otherwise
793             if (displayName != null) {
794                 isDuplicateName.put(displayName,
... isDuplicateName.containsKey(displayName));
795             }
796         }
797     }
798
799     /**
800     * Null-safe object comparison
801     *
802     * @param s1
803     * @param s2
804     * @return
805     */
806     public static boolean equals(Object o1, Object o2) {
807         return o1 == null ? o2 == null : o1.equals(o2);
808     }
809
810     public static void setAllowWeekForDetailView(boolean allowWeekView) {
811         mAllowWeekForDetailView = allowWeekView;
812     }
813
814     public static boolean getAllowWeekForDetailView() {
815         return mAllowWeekForDetailView;
816     }
817
818     public static boolean getConfigBool(Context c, int key) {
819         return c.getResources().getBoolean(key);
820     }
821
822     /**
823     * For devices with Jellybean or later, darkens the given color to
... ensure that white text is
824     * clearly visible on top of it. For devices prior to Jellybean,
... does nothing, as the
825     * sync adapter handles the color change.
```

```
826 *
827 * @param color
828 */
829 public static int getDisplayColorFromColor(int color) {
830     if (!isJellybeanOrLater()) {
831         return color;
832     }
833
834     float[] hsv = new float[3];
835     Color.colorToHSV(color, hsv);
836     hsv[1] = Math.min(hsv[1] * SATURATION_ADJUST, 1.0f);
837     hsv[2] = hsv[2] * INTENSITY_ADJUST;
838     return Color.HSVToColor(hsv);
839 }
840
841 // This takes a color and computes what it would look like blended
... with
842 // white. The result is the color that should be used for declined
... events.
843 public static int getDeclinedColorFromColor(int color) {
844     int bg = 0xffffffff;
845     int a = DECLINED_EVENT_ALPHA;
846     int r = (((color & 0x00ff0000) * a) + ((bg & 0x00ff0000) * (0xff
... - a))) & 0xff000000;
847     int g = (((color & 0x0000ff00) * a) + ((bg & 0x0000ff00) * (0xff
... - a))) & 0x00ff0000;
848     int b = (((color & 0x000000ff) * a) + ((bg & 0x000000ff) * (0xff
... - a))) & 0x0000ff00;
849     return (0xff000000) | ((r | g | b) >> 8);
850 }
851
852 public static void trySyncAndDisableUpgradeReceiver(Context context)
... {
853     final PackageManager pm = context.getPackageManager();
854     ComponentName upgradeComponent = new ComponentName(context,
... UpgradeReceiver.class);
855     if (pm.getComponentEnabledSetting(upgradeComponent) ==
856         PackageManager.COMPONENT_ENABLED_STATE_DISABLED) {
857         // The upgrade receiver has been disabled, which means this
... code has been run before,
858         // so no need to sync.
859         return;
860     }
861
862     Bundle extras = new Bundle();
863     extras.putBoolean(ContentResolver.SYNC_EXTRAS_MANUAL, true);
864     ContentResolver.requestSync(
865         null /* no account */,
866         Calendars.CONTENT_URI.getAuthority(),
867         extras);
```

```
868
869     // Now unregister the receiver so that we won't continue to sync
... every time.
870     pm.setComponentEnabledSetting(upgradeComponent,
871         PackageManager.COMPONENT_ENABLED_STATE_DISABLED,
... PackageManager.DONT_KILL_APP);
872     }
873
874     // A single strand represents one color of events. Events are divided
... up by
875     // color to make them convenient to draw. The black strand is special
... in
876     // that it holds conflicting events as well as color settings for
... allday on
877     // each day.
878     public static class DNAStrand {
879         public float[] points;
880         public int[] allDays; // color for the allday, 0 means no event
881         int position;
882         public int color;
883         int count;
884     }
885
886     // A segment is a single continuous length of time occupied by a
... single
887     // color. Segments should never span multiple days.
888     private static class DNASegment {
889         int startMinute; // in minutes since the start of the week
890         int endMinute;
891         int color; // Calendar color or black for conflicts
892         int day; // quick reference to the day this segment is on
893     }
894
895     /**
896     * Converts a list of events to a list of segments to draw. Assumes
... list is
897     * ordered by start time of the events. The function processes events
... for a
898     * range of days from firstJulianDay to firstJulianDay + dayXs.length
... - 1.
899     * The algorithm goes over all the events and creates a set of
... segments
900     * ordered by start time. This list of segments is then converted
... into a
901     * HashMap of strands which contain the draw points and are organized
... by
902     * color. The strands can then be drawn by setting the paint color to
... each
903     * strand's color and calling drawLines on its set of points. The
... points are
```



```
904 * set up using the following parameters.
905 * <ul>
906 * <li>Events between midnight and WORK_DAY_START_MINUTES are
... compressed
907 * into the first 1/8th of the space between top and bottom.</li>
908 * <li>Events between WORK_DAY_END_MINUTES and the following midnight
... are
909 * compressed into the last 1/8th of the space between top and
... bottom</li>
910 * <li>Events between WORK_DAY_START_MINUTES and WORK_DAY_END_MINUTES
... use
911 * the remaining 3/4ths of the space</li>
912 * <li>All segments drawn will maintain at least minPixels height,
... except
913 * for conflicts in the first or last 1/8th, which may be
... smaller</li>
914 * </ul>
915 *
916 * @param firstJulianDay The julian day of the first day of events
917 * @param events A list of events sorted by start time
918 * @param top The lowest y value the dna should be drawn at
919 * @param bottom The highest y value the dna should be drawn at
920 * @param dayXs An array of x values to draw the dna at, one for each
... day
921 * @param conflictColor the color to use for conflicts
922 * @return
923 */
924 public static HashMap<Integer, DNASTrand> createDNASTrands(int
... firstJulianDay,
925     ArrayList<Event> events, int top, int bottom, int minPixels,
... int[] dayXs,
926     Context context) {
927
928     if (!mMinutesLoaded) {
929         if (context == null) {
930             Log.wtf(TAG, "No context and haven't loaded parameters
... yet! Can't create DNA.");
931         }
932         Resources res = context.getResources();
933         CONFLICT_COLOR =
... res.getColor(R.color.month_dna_conflict_time_color);
934         WORK_DAY_START_MINUTES =
... res.getInteger(R.integer.work_start_minutes);
935         WORK_DAY_END_MINUTES =
... res.getInteger(R.integer.work_end_minutes);
936         WORK_DAY_END_LENGTH = DAY_IN_MINUTES - WORK_DAY_END_MINUTES;
937         WORK_DAY_MINUTES = WORK_DAY_END_MINUTES -
... WORK_DAY_START_MINUTES;
938         mMinutesLoaded = true;
939     }
```

```

940
941     if (events == null || events.isEmpty() || dayXs == null ||
... dayXs.length < 1
942         || bottom - top < 8 || minPixels < 0) {
943         Log.e(TAG,
944             "Bad values for createDNAstrands! events:" + events +
... " dayXs:"
945             + Arrays.toString(dayXs) + " bot-top:" +
... (bottom - top) + " minPixels:"
946             + minPixels);
947         return null;
948     }
949
950     LinkedList<DNAsegment> segments = new LinkedList<DNAsegment>();
951     HashMap<Integer, DNAstrand> strands = new HashMap<Integer,
... DNAstrand>();
952     // add a black strand by default, other colors will get added in
953     // the loop
954     DNAstrand blackStrand = new DNAstrand();
955     blackStrand.color = CONFLICT_COLOR;
956     strands.put(CONFLICT_COLOR, blackStrand);
957     // the min length is the number of minutes that will occupy
958     // MIN_SEGMENT_PIXELS in the 'work day' time slot. This computes
... the
959     // minutes/pixel * minpx where the number of pixels are 3/4 the
... total
960     // dna height: 4*(mins/(px * 3/4))
961     int minMinutes = minPixels * 4 * WORK_DAY_MINUTES / (3 * (bottom
... - top));
962
963     // There are slightly fewer than half as many pixels in 1/6 the
... space,
964     // so round to 2.5x for the min minutes in the non-work area
965     int minOtherMinutes = minMinutes * 5 / 2;
966     int lastJulianDay = firstJulianDay + dayXs.length - 1;
967
968     Event event = new Event();
969     // Go through all the events for the week
970     for (Event currEvent : events) {
971         // if this event is outside the weeks range skip it
972         if (currEvent.endDay < firstJulianDay || currEvent.startDay >
... lastJulianDay) {
973             continue;
974         }
975         if (currEvent.drawAsAllday()) {
976             addAllDayToStrands(currEvent, strands, firstJulianDay,
... dayXs.length);
977             continue;
978         }
979         // Copy the event over so we can clip its start and end to

```

```

979... our range
980     currEvent.copyTo(event);
981     if (event.startDay < firstJulianDay) {
982         event.startDay = firstJulianDay;
983         event.startTime = 0;
984     }
985     // If it starts after the work day make sure the start is at
... least
986     // minPixels from midnight
987     if (event.startTime > DAY_IN_MINUTES - minOtherMinutes) {
988         event.startTime = DAY_IN_MINUTES - minOtherMinutes;
989     }
990     if (event.endDay > lastJulianDay) {
991         event.endDay = lastJulianDay;
992         event.endTime = DAY_IN_MINUTES - 1;
993     }
994     // If the end time is before the work day make sure it ends
... at least
995     // minPixels after midnight
996     if (event.endTime < minOtherMinutes) {
997         event.endTime = minOtherMinutes;
998     }
999     // If the start and end are on the same day make sure they
... are at
1000     // least minPixels apart. This only needs to be done for
... times
1001     // outside the work day as the min distance for within the
... work day
1002     // is enforced in the segment code.
1003     if (event.startDay == event.endDay &&
1004         event.endTime - event.startTime < minOtherMinutes) {
1005         // If it's less than minPixels in an area before the work
1006         // day
1007         if (event.startTime < WORK_DAY_START_MINUTES) {
1008             // extend the end to the first easy guarantee that
... it's
1009             // minPixels
1010             event.endTime = Math.min(event.startTime +
... minOtherMinutes,
1011                                     WORK_DAY_START_MINUTES + minMinutes);
1012             // if it's in the area after the work day
1013         } else if (event.endTime > WORK_DAY_END_MINUTES) {
1014             // First try shifting the end but not past midnight
1015             event.endTime = Math.min(event.endTime +
... minOtherMinutes, DAY_IN_MINUTES - 1);
1016             // if it's still too small move the start back
1017             if (event.endTime - event.startTime <
... minOtherMinutes) {
1018                 event.startTime = event.endTime -
... minOtherMinutes;

```

```

1019     }
1020     }
1021     }
1022
1023     // This handles adding the first segment
1024     if (segments.size() == 0) {
1025         addNewSegment(segments, event, strands, firstJulianDay,
... 0, minMinutes);
1026         continue;
1027     }
1028     // Now compare our current start time to the end time of the
... last
1029     // segment in the list
1030     DNASegment lastSegment = segments.getLast();
1031     int startMinute = (event.startDay - firstJulianDay) *
... DAY_IN_MINUTES + event.startTime;
1032     int endMinute = Math.max((event.endDay - firstJulianDay) *
... DAY_IN_MINUTES
1033         + event.endTime, startMinute + minMinutes);
1034
1035     if (startMinute < 0) {
1036         startMinute = 0;
1037     }
1038     if (endMinute >= WEEK_IN_MINUTES) {
1039         endMinute = WEEK_IN_MINUTES - 1;
1040     }
1041     // If we start before the last segment in the list ends we
... need to
1042     // start going through the list as this may conflict with
... other
1043     // events
1044     if (startMinute < lastSegment.endTime) {
1045         int i = segments.size();
1046         // find the last segment this event intersects with
1047         while (--i >= 0 && endMinute <
... segments.get(i).startMinute);
1048
1049         DNASegment currSegment;
1050         // for each segment this event intersects with
1051         for (; i >= 0 && startMinute <= (currSegment =
... segments.get(i)).endTime; i--) {
1052             // if the segment is already a conflict ignore it
1053             if (currSegment.color == CONFLICT_COLOR) {
1054                 continue;
1055             }
1056             // if the event ends before the segment and wouldn't
... create
1057             // a segment that is too small split off the right
... side
1058             if (endMinute < currSegment.endTime - minMinutes) {

```

```

1059     DNASegment rhs = new DNASegment();
1060     rhs.endMinute = currSegment.endMinute;
1061     rhs.color = currSegment.color;
1062     rhs.startMinute = endMinute + 1;
1063     rhs.day = currSegment.day;
1064     currSegment.endMinute = endMinute;
1065     segments.add(i + 1, rhs);
1066     strands.get(rhs.color).count++;
1067     if (DEBUG) {
1068         Log.d(TAG, "Added rhs, curr:" +
... currSegment.toString() + " i:"
1069         + segments.get(i).toString());
1070     }
1071 }
1072 // if the event starts after the segment and wouldn't
... create
1073 // a segment that is too small split off the left
... side
1074 if (startMinute > currSegment.startMinute +
... minMinutes) {
1075     DNASegment lhs = new DNASegment();
1076     lhs.startMinute = currSegment.startMinute;
1077     lhs.color = currSegment.color;
1078     lhs.endMinute = startMinute - 1;
1079     lhs.day = currSegment.day;
1080     currSegment.startMinute = startMinute;
1081     // increment i so that we are at the right
... position when
1082     // referencing the segments to the right and left
... of the
1083     // current segment.
1084     segments.add(i++, lhs);
1085     strands.get(lhs.color).count++;
1086     if (DEBUG) {
1087         Log.d(TAG, "Added lhs, curr:" +
... currSegment.toString() + " i:"
1088         + segments.get(i).toString());
1089     }
1090 }
1091 // if the right side is black merge this with the
... segment to
1092 // the right if they're on the same day and overlap
1093 if (i + 1 < segments.size()) {
1094     DNASegment rhs = segments.get(i + 1);
1095     if (rhs.color == CONFLICT_COLOR &&
... currSegment.day == rhs.day
1096         && rhs.startMinute <=
... currSegment.endMinute + 1) {
1097         rhs.startMinute =
... Math.min(currSegment.startMinute, rhs.startMinute);

```

```

1098         segments.remove(currSegment);
1099         strands.get(currSegment.color).count--;
1100         // point at the new current segment
1101         currSegment = rhs;
1102     }
1103 }
1104 // if the left side is black merge this with the
... segment to
1105 // the left if they're on the same day and overlap
1106 if (i - 1 >= 0) {
1107     DNASegment lhs = segments.get(i - 1);
1108     if (lhs.color == CONFLICT_COLOR &&
... currSegment.day == lhs.day
1109         && lhs.endMinute >=
... currSegment.startMinute - 1) {
1110         lhs.endMinute =
... Math.max(currSegment.endMinute, lhs.endMinute);
1111         segments.remove(currSegment);
1112         strands.get(currSegment.color).count--;
1113         // point at the new current segment
1114         currSegment = lhs;
1115         // point i at the new current segment in case
... new
1116         // code is added
1117         i--;
1118     }
1119 }
1120 // if we're still not black, decrement the count for
... the
1121 // color being removed, change this to black, and
... increment
1122 // the black count
1123 if (currSegment.color != CONFLICT_COLOR) {
1124     strands.get(currSegment.color).count--;
1125     currSegment.color = CONFLICT_COLOR;
1126     strands.get(CONFLICT_COLOR).count++;
1127 }
1128 }
1129 }
1130 }
1131 // If this event extends beyond the last segment add a new
... segment
1132 if (endMinute > lastSegment.endMinute) {
1133     addNewSegment(segments, event, strands, firstJulianDay,
... lastSegment.endMinute,
1134         minMinutes);
1135 }
1136 }
1137 weaveDNAstrands(segments, firstJulianDay, strands, top, bottom,
... dayXs);

```



```
1138     return strands;
1139 }
1140
1141 // This figures out allDay colors as allDay events are found
1142 private static void addAllDayToStrands(Event event, HashMap<Integer,
... DNAStrand> strands,
1143     int firstJulianDay, int numDays) {
1144     DNAStrand strand = getOrCreateStrand(strands, CONFLICT_COLOR);
1145     // if we haven't initialized the allDay portion create it now
1146     if (strand.allDays == null) {
1147         strand.allDays = new int[numDays];
1148     }
1149
1150     // For each day this event is on update the color
1151     int end = Math.min(event.endDay - firstJulianDay, numDays - 1);
1152     for (int i = Math.max(event.startDay - firstJulianDay, 0); i <=
... end; i++) {
1153         if (strand.allDays[i] != 0) {
1154             // if this day already had a color, it is now a conflict
1155             strand.allDays[i] = CONFLICT_COLOR;
1156         } else {
1157             // else it's just the color of the event
1158             strand.allDays[i] = event.color;
1159         }
1160     }
1161 }
1162
1163 // This processes all the segments, sorts them by color, and
... generates a
1164 // list of points to draw
1165 private static void weaveDNAStrands(LinkedList<DNASegment> segments,
... int firstJulianDay,
1166     HashMap<Integer, DNAStrand> strands, int top, int bottom,
... int[] dayXs) {
1167     // First, get rid of any colors that ended up with no segments
1168     Iterator<DNAStrand> strandIterator = strands.values().iterator();
1169     while (strandIterator.hasNext()) {
1170         DNAStrand strand = strandIterator.next();
1171         if (strand.count < 1 && strand.allDays == null) {
1172             strandIterator.remove();
1173             continue;
1174         }
1175         strand.points = new float[strand.count * 4];
1176         strand.position = 0;
1177     }
1178     // Go through each segment and compute its points
1179     for (DNASegment segment : segments) {
1180         // Add the points to the strand of that color
1181         DNAStrand strand = strands.get(segment.color);
1182         int dayIndex = segment.day - firstJulianDay;
```

```
1183     int dayStartMinute = segment.startMinute % DAY_IN_MINUTES;
1184     int dayEndMinute = segment.endMinute % DAY_IN_MINUTES;
1185     int height = bottom - top;
1186     int workDayHeight = height * 3 / 4;
1187     int remainderHeight = (height - workDayHeight) / 2;
1188
1189     int x = dayXs[dayIndex];
1190     int y0 = 0;
1191     int y1 = 0;
1192
1193     y0 = top + getPixelOffsetFromMinutes(dayStartMinute,
... workDayHeight, remainderHeight);
1194     y1 = top + getPixelOffsetFromMinutes(dayEndMinute,
... workDayHeight, remainderHeight);
1195     if (DEBUG) {
1196         Log.d(TAG, "Adding " + Integer.toHexString(segment.color)
... + " at x,y0,y1: " + x
1197             + " " + y0 + " " + y1 + " for " + dayStartMinute
... + " " + dayEndMinute);
1198     }
1199     strand.points[strand.position++] = x;
1200     strand.points[strand.position++] = y0;
1201     strand.points[strand.position++] = x;
1202     strand.points[strand.position++] = y1;
1203 }
1204 }
1205
1206 /**
1207  * Compute a pixel offset from the top for a given minute from the
... work day
1208  * height and the height of the top area.
1209  */
1210 private static int getPixelOffsetFromMinutes(int minute, int
... workDayHeight,
1211     int remainderHeight) {
1212     int y;
1213     if (minute < WORK_DAY_START_MINUTES) {
1214         y = minute * remainderHeight / WORK_DAY_START_MINUTES;
1215     } else if (minute < WORK_DAY_END_MINUTES) {
1216         y = remainderHeight + (minute - WORK_DAY_START_MINUTES) *
... workDayHeight
1217             / WORK_DAY_MINUTES;
1218     } else {
1219         y = remainderHeight + workDayHeight + (minute -
... WORK_DAY_END_MINUTES) * remainderHeight
1220             / WORK_DAY_END_LENGTH;
1221     }
1222     return y;
1223 }
1224
```

```
1225 /**
1226     * Add a new segment based on the event provided. This will handle
... splitting
1227     * segments across day boundaries and ensures a minimum size for
... segments.
1228     */
1229     private static void addNewSegment(LinkedList<DNASegment> segments,
... Event event,
1230         HashMap<Integer, DNAStrand> strands, int firstJulianDay, int
... minStart, int minMinutes) {
1231         if (event.startDay > event.endDay) {
1232             Log.wtf(TAG, "Event starts after it ends: " +
... event.toString());
1233         }
1234         // If this is a multiday event split it up by day
1235         if (event.startDay != event.endDay) {
1236             Event lhs = new Event();
1237             lhs.color = event.color;
1238             lhs.startDay = event.startDay;
1239             // the first day we want the start time to be the actual
... start time
1240             lhs.startTime = event.startTime;
1241             lhs.endDay = lhs.startDay;
1242             lhs.endTime = DAY_IN_MINUTES - 1;
1243             // Nearly recursive iteration!
1244             while (lhs.startDay != event.endDay) {
1245                 addNewSegment(segments, lhs, strands, firstJulianDay,
... minStart, minMinutes);
1246                 // The days in between are all day, even though that
... shouldn't
1247                 // actually happen due to the allday filtering
1248                 lhs.startDay++;
1249                 lhs.endDay = lhs.startDay;
1250                 lhs.startTime = 0;
1251                 minStart = 0;
1252             }
1253             // The last day we want the end time to be the actual end
... time
1254             lhs.endTime = event.endTime;
1255             event = lhs;
1256         }
1257         // Create the new segment and compute its fields
1258         DNASegment segment = new DNASegment();
1259         int dayOffset = (event.startDay - firstJulianDay) *
... DAY_IN_MINUTES;
1260         int endOfDay = dayOffset + DAY_IN_MINUTES - 1;
1261         // clip the start if needed
1262         segment.startMinute = Math.max(dayOffset + event.startTime,
... minStart);
1263         // and extend the end if it's too small, but not beyond the end
```

```
1263... of the
1264     // day
1265     int minEnd = Math.min(segment.startMinute + minMinutes,
... endOfDay);
1266     segment.endMinute = Math.max(dayOffset + event.endTime, minEnd);
1267     if (segment.endMinute > endOfDay) {
1268         segment.endMinute = endOfDay;
1269     }
1270
1271     segment.color = event.color;
1272     segment.day = event.startDay;
1273     segments.add(segment);
1274     // increment the count for the correct color or add a new strand
... if we
1275     // don't have that color yet
1276     DNAStrand strand = getOrCreateStrand(strands, segment.color);
1277     strand.count++;
1278 }
1279
1280 /**
1281  * Try to get a strand of the given color. Create it if it doesn't
... exist.
1282  */
1283 private static DNAStrand getOrCreateStrand(HashMap<Integer,
... DNAStrand> strands, int color) {
1284     DNAStrand strand = strands.get(color);
1285     if (strand == null) {
1286         strand = new DNAStrand();
1287         strand.color = color;
1288         strand.count = 0;
1289         strands.put(strand.color, strand);
1290     }
1291     return strand;
1292 }
1293
1294 /**
1295  * Sends an intent to launch the top level Calendar view.
1296  *
1297  * @param context
1298  */
1299 public static void returnToCalendarHome(Context context) {
1300     Intent launchIntent = new Intent(context,
... AllInOneActivity.class);
1301     launchIntent.setAction(Intent.ACTION_DEFAULT);
1302     launchIntent.setFlags(Intent.FLAG_ACTIVITY_CLEAR_TOP);
1303     launchIntent.putExtra(INTENT_KEY_HOME, true);
1304     context.startActivity(launchIntent);
1305 }
1306
1307 /**
```

```
1308 * This sets up a search view to use Calendar's search suggestions
... provider
1309 * and to allow refining the search.
1310 *
1311 * @param view The {@link SearchView} to set up
1312 * @param act The activity using the view
1313 */
1314 public static void setUpSearchView(SearchView view, Activity act) {
1315     SearchManager searchManager = (SearchManager)
... act.getSystemService(Context.SEARCH_SERVICE);
1316
... view.setSearchableInfo(searchManager.getSearchableInfo(act.
... getComponentName()));
1317     view.setQueryRefinementEnabled(true);
1318 }
1319
1320 /**
1321 * Given a context and a time in millis since unix epoch figures out
... the
1322 * correct week of the year for that time.
1323 *
1324 * @param millisSinceEpoch
1325 * @return
1326 */
1327 public static int getWeekNumberFromTime(long millisSinceEpoch,
... Context context) {
1328     Time weekTime = new Time(getTimeZone(context, null));
1329     weekTime.set(millisSinceEpoch);
1330     weekTime.normalize(true);
1331     int firstDayOfWeek = getFirstDayOfWeek(context);
1332     // if the date is on Saturday or Sunday and the start of the week
1333     // isn't Monday we may need to shift the date to be in the
... correct
1334     // week
1335     if (weekTime.weekDay == Time.SUNDAY
1336         && (firstDayOfWeek == Time.SUNDAY || firstDayOfWeek ==
... Time.SATURDAY)) {
1337         weekTime.monthDay++;
1338         weekTime.normalize(true);
1339     } else if (weekTime.weekDay == Time.SATURDAY && firstDayOfWeek ==
... Time.SATURDAY) {
1340         weekTime.monthDay += 2;
1341         weekTime.normalize(true);
1342     }
1343     return weekTime.getWeekNumber();
1344 }
1345
1346 /**
1347 * Formats a day of the week string. This is either just the name of
... the day
```

```
1348 * or a combination of yesterday/today/tomorrow and the day of the
... week.
1349 *
1350 * @param julianDay The julian day to get the string for
1351 * @param todayJulianDay The julian day for today's date
1352 * @param millis A utc millis since epoch time that falls on julian
... day
1353 * @param context The calling context, used to get the timezone and
... do the
1354 *         formatting
1355 * @return
1356 */
1357 public static String getDayOfWeekString(int julianDay, int
... todayJulianDay, long millis,
1358         Context context) {
1359     getTimeZone(context, null);
1360     int flags = DateUtils.FORMAT_SHOW_WEEKDAY;
1361     String dayViewText;
1362     if (julianDay == todayJulianDay) {
1363         dayViewText = context.getString(R.string.agenda_today,
1364             mTZUtils.formatDateRange(context, millis, millis,
... flags).toString());
1365     } else if (julianDay == todayJulianDay - 1) {
1366         dayViewText = context.getString(R.string.agenda_yesterday,
1367             mTZUtils.formatDateRange(context, millis, millis,
... flags).toString());
1368     } else if (julianDay == todayJulianDay + 1) {
1369         dayViewText = context.getString(R.string.agenda_tomorrow,
1370             mTZUtils.formatDateRange(context, millis, millis,
... flags).toString());
1371     } else {
1372         dayViewText = mTZUtils.formatDateRange(context, millis,
... millis, flags).toString();
1373     }
1374     dayViewText = dayViewText.toUpperCase();
1375     return dayViewText;
1376 }
1377
1378 // Calculate the time until midnight + 1 second and set the handler
... to
1379 // do run the runnable
1380 public static void setMidnightUpdater(Handler h, Runnable r, String
... timezone) {
1381     if (h == null || r == null || timezone == null) {
1382         return;
1383     }
1384     long now = System.currentTimeMillis();
1385     Time time = new Time(timezone);
1386     time.set(now);
1387     long runInMillis = (24 * 3600 - time.hour * 3600 - time.minute *

```

```
1387... 60 -
1388         time.second + 1) * 1000;
1389     h.removeCallbacks(r);
1390     h.postDelayed(r, runInMillis);
1391 }
1392
1393 // Stop the midnight update thread
1394 public static void resetMidnightUpdater(Handler h, Runnable r) {
1395     if (h == null || r == null) {
1396         return;
1397     }
1398     h.removeCallbacks(r);
1399 }
1400
1401 /**
1402  * Returns a string description of the specified time interval.
1403  */
1404 public static String getDisplayedDatetime(long startMillis, long
... endMillis, long currentMillis,
1405     String localTimezone, boolean allDay, Context context) {
1406     // Configure date/time formatting.
1407     int flagsDate = DateUtils.FORMAT_SHOW_DATE |
... DateUtils.FORMAT_SHOW_WEEKDAY;
1408     int flagsTime = DateUtils.FORMAT_SHOW_TIME;
1409     if (DateFormat.is24HourFormat(context)) {
1410         flagsTime |= DateUtils.FORMAT_24HOUR;
1411     }
1412
1413     Time currentTime = new Time(localTimezone);
1414     currentTime.set(currentMillis);
1415     Resources resources = context.getResources();
1416     String datetimeString = null;
1417     if (allDay) {
1418         // All day events require special timezone adjustment.
1419         long localStartMillis = convertAlldayUtcToLocal(null,
... startMillis, localTimezone);
1420         long localEndMillis = convertAlldayUtcToLocal(null,
... endMillis, localTimezone);
1421         if (singleDayEvent(localStartMillis, localEndMillis,
... currentTime.gmtoff)) {
1422             // If possible, use "Today" or "Tomorrow" instead of a
... full date string.
1423             int todayOrTomorrow =
... isTodayOrTomorrow(context.getResources(),
1424                 localStartMillis, currentMillis,
... currentTime.gmtoff);
1425             if (TODAY == todayOrTomorrow) {
1426                 datetimeString = resources.getString(R.string.today);
1427             } else if (TOMORROW == todayOrTomorrow) {
1428                 datetimeString =
```



```
1428... resources.getString(R.string.tomorrow);
1429     }
1430 }
1431     if (datetimeString == null) {
1432         // For multi-day allday events or single-day all-day
... events that are not
1433         // today or tomorrow, use framework formatter.
1434         Formatter f = new Formatter(new StringBuilder(50),
... Locale.getDefault());
1435         datetimeString = DateUtils.formatDateRange(context, f,
... startMillis,
1436             endMillis, flagsDate,
... Time.TIMEZONE_UTC).toString();
1437     }
1438     } else {
1439         if (singleDayEvent(startMillis, endMillis,
... currentTime.gmtoff)) {
1440             // Format the time.
1441             String timeString = Utils.formatDateRange(context,
... startMillis, endMillis,
1442                 flagsTime);
1443
1444             // If possible, use "Today" or "Tomorrow" instead of a
... full date string.
1445             int todayOrTomorrow =
... isTodayOrTomorrow(context.getResources(), startMillis,
1446                 currentMillis, currentTime.gmtoff);
1447             if (TODAY == todayOrTomorrow) {
1448                 // Example: "Today at 1:00pm - 2:00 pm"
1449                 datetimeString =
... resources.getString(R.string.today_at_time_fmt,
1450                     timeString);
1451             } else if (TOMORROW == todayOrTomorrow) {
1452                 // Example: "Tomorrow at 1:00pm - 2:00 pm"
1453                 datetimeString =
... resources.getString(R.string.tomorrow_at_time_fmt,
1454                     timeString);
1455             } else {
1456                 // Format the full date. Example: "Thursday, April
... 12, 1:00pm - 2:00pm"
1457                 String dateString = Utils.formatDateRange(context,
... startMillis, endMillis,
1458                     flagsDate);
1459                 datetimeString =
... resources.getString(R.string.date_time_fmt, dateString,
1460                     timeString);
1461             }
1462         } else {
1463             // For multiday events, shorten day/month names.
1464             // Example format: "Fri Apr 6, 5:00pm - Sun, Apr 8,
```

```
1464... 6:00pm
1465         int flagsDatetime = flagsDate | flagsTime |
... DateUtils.FORMAT_ABBREV_MONTH |
1466             DateUtils.FORMAT_ABBREV_WEEKDAY;
1467         datetimeString = Utils.formatDateRange(context,
... startMillis, endMillis,
1468             flagsDatetime);
1469     }
1470 }
1471     return datetimeString;
1472 }
1473
1474 /**
1475  * Returns the timezone to display in the event info, if the local
... timezone is different
1476  * from the event timezone. Otherwise returns null.
1477  */
1478     public static String getDisplayedTimezone(long startMillis, String
... localTimezone,
1479         String eventTimezone) {
1480         String tzDisplay = null;
1481         if (!TextUtils.equals(localTimezone, eventTimezone)) {
1482             // Figure out if this is in DST
1483             TimeZone tz = TimeZone.getTimeZone(localTimezone);
1484             if (tz == null || tz.getID().equals("GMT")) {
1485                 tzDisplay = localTimezone;
1486             } else {
1487                 Time startTime = new Time(localTimezone);
1488                 startTime.set(startMillis);
1489                 tzDisplay = tz.getDisplayName(startTime.isDst != 0,
... TimeZone.SHORT);
1490             }
1491         }
1492         return tzDisplay;
1493     }
1494
1495 /**
1496  * Returns whether the specified time interval is in a single day.
1497  */
1498     private static boolean singleDayEvent(long startMillis, long
... endMillis, long localGmtOffset) {
1499         if (startMillis == endMillis) {
1500             return true;
1501         }
1502
1503         // An event ending at midnight should still be a single-day
... event, so check
1504         // time end-1.
1505         int startDay = Time.getJulianDay(startMillis, localGmtOffset);
1506         int endDay = Time.getJulianDay(endMillis - 1, localGmtOffset);
```

```
1507     return startDay == endDay;
1508 }
1509
1510 // Using int constants as a return value instead of an enum to
... minimize resources.
1511 private static final int TODAY = 1;
1512 private static final int TOMORROW = 2;
1513 private static final int NONE = 0;
1514
1515 /**
1516  * Returns TODAY or TOMORROW if applicable. Otherwise returns NONE.
1517  */
1518 private static int isTodayOrTomorrow(Resources r, long dayMillis,
1519     long currentMillis, long localGmtOffset) {
1520     int startDay = Time.getJulianDay(dayMillis, localGmtOffset);
1521     int currentDay = Time.getJulianDay(currentMillis,
... localGmtOffset);
1522
1523     int days = startDay - currentDay;
1524     if (days == 1) {
1525         return TOMORROW;
1526     } else if (days == 0) {
1527         return TODAY;
1528     } else {
1529         return NONE;
1530     }
1531 }
1532
1533 /**
1534  * Create an intent for emailing attendees of an event.
1535  *
1536  * @param resources The resources for translating strings.
1537  * @param eventTitle The title of the event to use as the email
... subject.
1538  * @param body The default text for the email body.
1539  * @param toEmails The list of emails for the 'to' line.
1540  * @param ccEmails The list of emails for the 'cc' line.
1541  * @param ownerAccount The owner account to use as the email sender.
1542  */
1543 public static Intent createEmailAttendeesIntent(Resources resources,
... String eventTitle,
1544     String body, List<String> toEmails, List<String> ccEmails,
... String ownerAccount) {
1545     List<String> toList = toEmails;
1546     List<String> ccList = ccEmails;
1547     if (toEmails.size() <= 0) {
1548         if (ccEmails.size() <= 0) {
1549             // TODO: Return a SEND intent if no one to email to, to
... at least populate
1550             // a draft email with the subject (and no recipients).
```

```
1551         throw new IllegalArgumentException("Both toEmails and  
... ccEmails are empty.");  
1552     }  
1553  
1554     // Email app does not work with no "to" recipient. Move all  
... 'cc' to 'to'  
1555     // in this case.  
1556     toList = ccEmails;  
1557     ccList = null;  
1558 }  
1559  
1560     // Use the event title as the email subject (prepending with 'Re:  
... ').  
1561     String subject = null;  
1562     if (eventTitle != null) {  
1563         subject = resources.getString(R.string.email_subject_prefix)  
... + eventTitle;  
1564     }  
1565  
1566     // Use the SENDTO intent with a 'mailto' URI, because using SEND  
... will cause  
1567     // the picker to show apps like text messaging, which does not  
... make sense  
1568     // for email addresses. We put all data in the URI instead of  
... using the extra  
1569     // Intent fields (ie. EXTRA_CC, etc) because some email apps  
... might not handle  
1570     // those (though gmail does).  
1571     Uri.Builder uriBuilder = new Uri.Builder();  
1572     uriBuilder.scheme("mailto");  
1573  
1574     // We will append the first email to the 'mailto' field later  
... (because the  
1575     // current state of the Email app requires it). Add the  
... remaining 'to' values  
1576     // here. When the email codebase is updated, we can simplify  
... this.  
1577     if (toList.size() > 1) {  
1578         for (int i = 1; i < toList.size(); i++) {  
1579             // The Email app requires repeated parameter settings  
... instead of  
1580             // a single comma-separated list.  
1581             uriBuilder.appendQueryParameter("to", toList.get(i));  
1582         }  
1583     }  
1584  
1585     // Add the subject parameter.  
1586     if (subject != null) {  
1587         uriBuilder.appendQueryParameter("subject", subject);  
1588     }
```

```
1589
1590     // Add the subject parameter.
1591     if (body != null) {
1592         uriBuilder.appendQueryParameter("body", body);
1593     }
1594
1595     // Add the cc parameters.
1596     if (ccList != null && ccList.size() > 0) {
1597         for (String email : ccList) {
1598             uriBuilder.appendQueryParameter("cc", email);
1599         }
1600     }
1601
1602     // Insert the first email after 'mailto:' in the URI manually
... since Uri.Builder
1603     // doesn't seem to have a way to do this.
1604     String uri = uriBuilder.toString();
1605     if (uri.startsWith("mailto:")) {
1606         StringBuilder builder = new StringBuilder(uri);
1607         builder.insert(7, Uri.encode(toList.get(0)));
1608         uri = builder.toString();
1609     }
1610
1611     // Start the email intent. Email from the account of the
... calendar owner in case there
1612     // are multiple email accounts.
1613     Intent emailIntent = new
... Intent(android.content.Intent.ACTION_SENDTO, Uri.parse(uri));
1614     emailIntent.putExtra("fromAccountString", ownerAccount);
1615
1616     // Workaround a Email bug that overwrites the body with this
... intent extra. If not
1617     // set, it clears the body.
1618     if (body != null) {
1619         emailIntent.putExtra(Intent.EXTRA_TEXT, body);
1620     }
1621
1622     return Intent.createChooser(emailIntent,
... resources.getString(R.string.email_picker_label));
1623 }
1624
1625 /**
1626  * Example fake email addresses used as attendee emails are resources
... like conference rooms,
1627  * or another calendar, etc. These all end in "calendar.google.com".
1628  */
1629 public static boolean isValidEmail(String email) {
1630     return email != null &&
... !email.endsWith(MACHINE_GENERATED_ADDRESS);
1631 }
```

```
1632
1633     /**
1634     * Returns true if:
1635     * (1) the email is not a resource like a conference room or
... another calendar.
1636     * Catch most of these by filtering out suffix
... calendar.google.com.
1637     * (2) the email is not equal to the sync account to prevent
... mailing himself.
1638     */
1639     public static boolean isEmailableFrom(String email, String
... syncAccountName) {
1640         return Utils.isValidEmail(email) &&
... !email.equals(syncAccountName);
1641     }
1642
1643     /**
1644     * Inserts a drawable with today's day into the today's icon in the
... option menu
1645     * @param icon - today's icon from the options menu
1646     */
1647     public static void setTodayIcon(LayerDrawable icon, Context c, String
... timezone) {
1648         DayOfMonthDrawable today;
1649
1650         // Reuse current drawable if possible
1651         Drawable currentDrawable =
... icon.findDrawableByLayerId(R.id.today_icon_day);
1652         if (currentDrawable != null && currentDrawable instanceof
... DayOfMonthDrawable) {
1653             today = (DayOfMonthDrawable)currentDrawable;
1654         } else {
1655             today = new DayOfMonthDrawable(c);
1656         }
1657         // Set the day and update the icon
1658         Time now = new Time(timezone);
1659         now.setToNow();
1660         now.normalize(false);
1661         today.setDayOfMonth(now.monthDay);
1662         icon.mutate();
1663         icon.setDrawableByLayerId(R.id.today_icon_day, today);
1664     }
1665
1666     private static class CalendarBroadcastReceiver extends
... BroadcastReceiver {
1667
1668         Runnable mCallback;
1669
1670         public CalendarBroadcastReceiver(Runnable callback) {
1671             super();
```

```
1672         mCallback = callback;
1673     }
1674     @Override
1675     public void onReceive(Context context, Intent intent) {
1676         if (intent.getAction().equals(Intent.ACTION_DATE_CHANGED) ||
1677             intent.getAction().equals(Intent.ACTION_TIME_CHANGED)
1678             ||
1679             intent.getAction().equals(Intent.ACTION_LOCALE_CHANGED) ||
1680             intent.getAction().equals(Intent.ACTION_TIMEZONE_CHANGED)) {
1681             if (mCallback != null) {
1682                 mCallback.run();
1683             }
1684         }
1685     }
1686
1687     public static BroadcastReceiver setTimeChangesReceiver(Context c,
1688     Runnable callback) {
1689         IntentFilter filter = new IntentFilter();
1690         filter.addAction(Intent.ACTION_TIME_CHANGED);
1691         filter.addAction(Intent.ACTION_DATE_CHANGED);
1692         filter.addAction(Intent.ACTION_TIMEZONE_CHANGED);
1693         filter.addAction(Intent.ACTION_LOCALE_CHANGED);
1694
1695         CalendarBroadcastReceiver r = new
1696     CalendarBroadcastReceiver(callback);
1697         c.registerReceiver(r, filter);
1698         return r;
1699     }
1700
1701     public static void clearTimeChangesReceiver(Context c,
1702     BroadcastReceiver r) {
1703         c.unregisterReceiver(r);
1704     }
1705
1706     /**
1707     * Get a list of quick responses used for emailing guests from the
1708     * SharedPreferences. If not are found, get the hard coded ones that
1709     shipped
1710     * with the app
1711     *
1712     * @param context
1713     * @return a list of quick responses.
1714     */
1715     public static String[] getQuickResponses(Context context) {
1716         String[] s = Utils.getSharedPreference(context,
1717     KEY_QUICK_RESPONSES, (String[]) null);
1718     }
```



```
1714     if (s == null) {
1715         s =
... context.getResources().getStringArray(R.array.quick_response_defaults);
1716     }
1717
1718     return s;
1719 }
1720
1721 /**
1722  * Return the app version code.
1723  */
1724 public static String getVersionCode(Context context) {
1725     if (sVersion == null) {
1726         try {
1727             sVersion = context.getPackageManager().getPackageInfo(
1728                 context.getPackageName(), 0).versionName;
1729         } catch (PackageManager.NameNotFoundException e) {
1730             // Can't find version; just leave it blank.
1731             Log.e(TAG, "Error finding package " +
... context.getApplicationInfo().packageName);
1732         }
1733     }
1734     return sVersion;
1735 }
1736
1737 /**
1738  * Checks the server for an updated list of Calendars (in the
... background).
1739  *
1740  * If a Calendar is added on the web (and it is selected and not
1741  * hidden) then it will be added to the list of calendars on the
... phone
1742  * (when this finishes). When a new calendar from the
1743  * web is added to the phone, then the events for that calendar are
... also
1744  * downloaded from the web.
1745  *
1746  * This sync is done automatically in the background when the
1747  * SelectCalendars activity and fragment are started.
1748  *
1749  * @param account - The account to sync. May be null to sync all
... accounts.
1750  */
1751 public static void startCalendarMetafeedSync(Account account) {
1752     Bundle extras = new Bundle();
1753     extras.putBoolean(ContentResolver.SYNC_EXTRAS_MANUAL, true);
1754     extras.putBoolean("metafeedonly", true);
1755     ContentResolver.requestSync(account,
... Calendars.CONTENT_URI.getAuthority(), extras);
1756 }
```

```
1757
1758     /**
1759     * Replaces stretches of text that look like addresses and phone
... numbers with clickable
1760     * links. If lastDitchGeo is true, then if no links are found in the
... textview, the entire
1761     * string will be converted to a single geo link. Any spans that may
... have previously been
1762     * in the text will be cleared out.
1763     * <p>
1764     * This is really just an enhanced version of Linkify.addLinks().
1765     *
1766     * @param text - The string to search for links.
1767     * @param lastDitchGeo - If no links are found, turn the entire
... string into one geo link.
1768     * @return Spannable object containing the list of URL spans found.
1769     */
1770     public static Spannable extendedLinkify(String text, boolean
... lastDitchGeo) {
1771         // We use a copy of the string argument so it's available for
... later if necessary.
1772         Spannable spanText = SpannableString.valueOf(text);
1773
1774         /**
1775         * If the text includes a street address like "1600 Amphitheater
... Parkway, 94043",
1776         * the current Linkify code will identify "94043" as a phone
... number and invite
1777         * you to dial it (and not provide a map link for the address).
... For outside US,
1778         * use Linkify result iff it spans the entire text. Otherwise
... send the user to maps.
1779         */
1780         String defaultPhoneRegion = System.getProperty("user.region",
... "US");
1781         if (!defaultPhoneRegion.equals("US")) {
1782             Linkify.addLinks(spanText, Linkify.ALL);
1783
1784             // If Linkify links the entire text, use that result.
1785             URLSpan[] spans = spanText.getSpans(0, spanText.length(),
... URLSpan.class);
1786             if (spans.length == 1) {
1787                 int linkStart = spanText.getSpanStart(spans[0]);
1788                 int linkEnd = spanText.getSpanEnd(spans[0]);
1789                 if (linkStart <= indexFirstNonWhitespaceChar(spanText) &&
1790                     linkEnd >= indexLastNonWhitespaceChar(spanText) +
... 1) {
1791                 return spanText;
1792             }
1793         }
```

```
1794
1795     // Otherwise, to be cautious and to try to prevent false
... positives, reset the spannable.
1796     spanText = SpannableString.valueOf(text);
1797     // If lastDitchGeo is true, default the entire string to geo.
1798     if (lastDitchGeo && !text.isEmpty()) {
1799         Linkify.addLinks(spanText, mWildcardPattern,
... "geo:0,0?q=");
1800     }
1801     return spanText;
1802 }
1803
1804 /*
1805  * For within US, we want to have better recognition of phone
... numbers without losing
1806  * any of the existing annotations. Ideally this would be
... addressed by improving Linkify.
1807  * For now we manage it as a second pass over the text.
1808  *
1809  * URIs and e-mail addresses are pretty easy to pick out of text.
... Phone numbers
1810  * are a bit tricky because they have radically different formats
... in different
1811  * countries, in terms of both the digits and the way in which
... they are commonly
1812  * written or presented (e.g. the punctuation and spaces in
... "(650) 555-1212").
1813  * The expected format of a street address is defined in
... WebView.findAddress(). It's
1814  * pretty narrowly defined, so it won't often match.
1815  *
1816  * The RFC 3966 specification defines the format of a "tel:" URI.
1817  *
1818  * Start by letting Linkify find anything that isn't a phone
... number. We have to let it
1819  * run first because every invocation removes all previous
... URLSpan annotations.
1820  *
1821  * Ideally we'd use the external/libphonenumber routines, but
... those aren't available
1822  * to unbundled applications.
1823  */
1824 boolean linkifyFoundLinks = Linkify.addLinks(spanText,
1825     Linkify.ALL & ~(Linkify.PHONE_NUMBERS));
1826
1827 /*
1828  * Get a list of any spans created by Linkify, for the coordinate
... overlapping span check.
1829  */
1830 URLSpan[] existingSpans = spanText.getSpans(0, spanText.length(),
```

```
1830... URLSpan.class);
1831
1832     /*
1833     * Check for coordinates.
1834     * This must be done before phone numbers because longitude may
... look like a phone number.
1835     */
1836     Matcher coordMatcher = COORD_PATTERN.matcher(spanText);
1837     int coordCount = 0;
1838     while (coordMatcher.find()) {
1839         int start = coordMatcher.start();
1840         int end = coordMatcher.end();
1841         if (spanWillOverlap(spanText, existingSpans, start, end)) {
1842             continue;
1843         }
1844
1845         URLSpan span = new URLSpan("geo:0,0?q=" +
... coordMatcher.group());
1846         spanText.setSpan(span, start, end,
... Spanned.SPAN_EXCLUSIVE_EXCLUSIVE);
1847         coordCount++;
1848     }
1849
1850     /*
1851     * Update the list of existing spans, for the phone number
... overlapping span check.
1852     */
1853     existingSpans = spanText.getSpans(0, spanText.length(),
... URLSpan.class);
1854
1855     /*
1856     * Search for phone numbers.
1857     *
1858     * Some URIs contain strings of digits that look like phone
... numbers. If both the URI
1859     * scanner and the phone number scanner find them, we want the
... URI link to win. Since
1860     * the URI scanner runs first, we just need to avoid creating
... overlapping spans.
1861     */
1862     int[] phoneSequences = findNanpPhoneNumbers(text);
1863
1864     /*
1865     * Insert spans for the numbers we found. We generate "tel:"
... URIs.
1866     */
1867     int phoneCount = 0;
1868     for (int match = 0; match < phoneSequences.length / 2; match++) {
1869         int start = phoneSequences[match*2];
1870         int end = phoneSequences[match*2 + 1];
```

```
1871
1872     if (spanWillOverlap(spanText, existingSpans, start, end)) {
1873         continue;
1874     }
1875
1876     /*
1877     * The Linkify code takes the matching span and strips out
... everything that isn't a
1878     * digit or '+' sign. We do the same here. Extension
... numbers will get appended
1879     * without a separator, but the dialer wasn't doing anything
... useful with ";ext="
1880     * anyway.
1881     */
1882
1883     //String dialStr = phoneUtil.format(match.number(),
1884     //    PhoneNumberUtil.PhoneNumberFormat.RFC3966);
1885     StringBuilder dialBuilder = new StringBuilder();
1886     for (int i = start; i < end; i++) {
1887         char ch = spanText.charAt(i);
1888         if (ch == '+' || Character.isDigit(ch)) {
1889             dialBuilder.append(ch);
1890         }
1891     }
1892     URLSpan span = new URLSpan("tel:" + dialBuilder.toString());
1893
1894     spanText.setSpan(span, start, end,
... Spanned.SPAN_EXCLUSIVE_EXCLUSIVE);
1895     phoneCount++;
1896 }
1897
1898 /*
1899 * If lastDitchGeo, and no other links have been found, set the
... entire string as a geo link.
1900 */
1901 if (lastDitchGeo && !text.isEmpty() &&
1902     !linkifyFoundLinks && phoneCount == 0 && coordCount == 0)
... {
1903     if (Log.isLoggable(TAG, Log.VERBOSE)) {
1904         Log.v(TAG, "No linkification matches, using geo
... default");
1905     }
1906     Linkify.addLinks(spanText, mWildcardPattern, "geo:0,0?q=");
1907 }
1908
1909     return spanText;
1910 }
1911
1912 private static int indexFirstNonWhitespaceChar(CharSequence str) {
1913     for (int i = 0; i < str.length(); i++) {
```

```
1914     if (!Character.isWhitespace(str.charAt(i))) {
1915         return i;
1916     }
1917 }
1918 return -1;
1919 }
1920
1921 private static int indexLastNonWhitespaceChar(CharSequence str) {
1922     for (int i = str.length() - 1; i >= 0; i--) {
1923         if (!Character.isWhitespace(str.charAt(i))) {
1924             return i;
1925         }
1926     }
1927     return -1;
1928 }
1929
1930 /**
1931  * Finds North American Numbering Plan (NANP) phone numbers in the
... input text.
1932  *
1933  * @param text The text to scan.
1934  * @return A list of [start, end) pairs indicating the positions of
... phone numbers in the input.
1935  */
1936 // @VisibleForTesting
1937 static int[] findNanpPhoneNumbers(CharSequence text) {
1938     ArrayList<Integer> list = new ArrayList<Integer>();
1939
1940     int startPos = 0;
1941     int endPos = text.length() - NANP_MIN_DIGITS + 1;
1942     if (endPos < 0) {
1943         return new int[] {};
1944     }
1945
1946     /*
1947     * We can't just strip the whitespace out and crunch it down,
... because the whitespace
1948     * is significant. March through, trying to figure out where
... numbers start and end.
1949     */
1950     while (startPos < endPos) {
1951         // skip whitespace
1952         while (Character.isWhitespace(text.charAt(startPos)) &&
... startPos < endPos) {
1953             startPos++;
1954         }
1955         if (startPos == endPos) {
1956             break;
1957         }
1958     }
```

```

1959 // check for a match at this position
1960 int matchEnd = findNanpMatchEnd(text, startPos);
1961 if (matchEnd > startPos) {
1962     list.add(startPos);
1963     list.add(matchEnd);
1964     startPos = matchEnd; // skip past match
1965 } else {
1966     // skip to next whitespace char
1967     while (!Character.isWhitespace(text.charAt(startPos)) &&
... startPos < endPos) {
1968         startPos++;
1969     }
1970 }
1971 }
1972
1973 int[] result = new int[list.size()];
1974 for (int i = list.size() - 1; i >= 0; i--) {
1975     result[i] = list.get(i);
1976 }
1977 return result;
1978 }
1979
1980 /**
1981  * Checks to see if there is a valid phone number in the input,
... starting at the specified
1982  * offset. If so, the index of the last character + 1 is returned.
... The input is assumed
1983  * to begin with a non-whitespace character.
1984  *
1985  * @return Exclusive end position, or -1 if not a match.
1986  */
1987 private static int findNanpMatchEnd(CharSequence text, int startPos)
... {
1988     /**
1989     * A few interesting cases:
1990     * 94043 # too short, ignore
1991     * 123456789012 # too long, ignore
1992     * +1 (650) 555-1212 # 11 digits, spaces
1993     * (650) 555 5555 # Second space, only when
... first is present.
1994     * (650) 555-1212, (650) 555-1213 # two numbers, return
... first
1995     * 1-650-555-1212 # 11 digits with leading
... '1'
1996     * *#650.555.1212#! # 10 digits, include #*,
... ignore trailing '!'
1997     * 555.1212 # 7 digits
1998     *
1999     * For the most part we want to break on whitespace, but it's
... common to leave a space

```



```
2000 * between the initial '1' and/or after the area code.
2001 */
2002
2003 // Check for "tel:" URI prefix.
2004 if (text.length() > startPos+4
2005     && text.subSequence(startPos,
... startPos+4).toString().equalsIgnoreCase("tel:")) {
2006     startPos += 4;
2007 }
2008
2009 int endPos = text.length();
2010 int curPos = startPos;
2011 int foundDigits = 0;
2012 char firstDigit = 'x';
2013 boolean foundWhiteSpaceAfterAreaCode = false;
2014
2015 while (curPos <= endPos) {
2016     char ch;
2017     if (curPos < endPos) {
2018         ch = text.charAt(curPos);
2019     } else {
2020         ch = 27; // fake invalid symbol at end to trigger loop
... break
2021     }
2022
2023     if (Character.isDigit(ch)) {
2024         if (foundDigits == 0) {
2025             firstDigit = ch;
2026         }
2027         foundDigits++;
2028         if (foundDigits > NANP_MAX_DIGITS) {
2029             // too many digits, stop early
2030             return -1;
2031         }
2032     } else if (Character.isWhitespace(ch)) {
2033         if ( (firstDigit == '1' && foundDigits == 4) ||
2034             (foundDigits == 3)) {
2035             foundWhiteSpaceAfterAreaCode = true;
2036         } else if (firstDigit == '1' && foundDigits == 1) {
2037         } else if (foundWhiteSpaceAfterAreaCode
2038                 && ( (firstDigit == '1' && (foundDigits == 7)) ||
... (foundDigits == 6))) {
2039             } else {
2040                 break;
2041             }
2042         } else if (NANP_ALLOWED_SYMBOLS.indexOf(ch) == -1) {
2043             break;
2044         }
2045         // else it's an allowed symbol
2046
```

```
2047         curPos++;
2048     }
2049
2050     if ((firstDigit != '1' && (foundDigits == 7 || foundDigits ==
... 10)) ||
2051         (firstDigit == '1' && foundDigits == 11)) {
2052         // match
2053         return curPos;
2054     }
2055
2056     return -1;
2057 }
2058
2059 /**
2060  * Determines whether a new span at [start,end) will overlap with any
... existing span.
2061  */
2062     private static boolean spanWillOverlap(Spannable spanText, URLSpan[]
... spanList, int start,
2063         int end) {
2064         if (start == end) {
2065             // empty span, ignore
2066             return false;
2067         }
2068         for (URLSpan span : spanList) {
2069             int existingStart = spanText.getSpanStart(span);
2070             int existingEnd = spanText.getSpanEnd(span);
2071             if ((start >= existingStart && start < existingEnd) ||
2072                 end > existingStart && end <= existingEnd) {
2073                 if (Log.isLoggable(TAG, Log.VERBOSE)) {
2074                     CharSequence seq = spanText.subSequence(start, end);
2075                     Log.v(TAG, "Not linkifying " + seq + " as phone
... number due to overlap");
2076                 }
2077                 return true;
2078             }
2079         }
2080
2081         return false;
2082     }
2083
2084     /**
2085     * @param bundle The incoming bundle that contains the reminder info.
2086     * @return ArrayList<ReminderEntry> of the reminder minutes and
... methods.
2087     */
2088     public static ArrayList<ReminderEntry> readRemindersFromBundle(Bundle
... bundle) {
2089         ArrayList<ReminderEntry> reminders = null;
2090
```

```
2091 ArrayList<Integer> reminderMinutes = bundle.getIntegerArrayList(
2092     EventInfoFragment.BUNDLE_KEY_REMINDER_MINUTES);
2093 ArrayList<Integer> reminderMethods = bundle.getIntegerArrayList(
2094     EventInfoFragment.BUNDLE_KEY_REMINDER_METHODS);
2095 if (reminderMinutes == null || reminderMethods == null) {
2096     if (reminderMinutes != null || reminderMethods != null) {
2097         String nullList = (reminderMinutes == null?
2098             "reminderMinutes" : "reminderMethods");
2099         Log.d(TAG, String.format("Error resolving reminders: %s
... was null",
2100             nullList));
2101     }
2102     return null;
2103 }
2104
2105 int numReminders = reminderMinutes.size();
2106 if (numReminders == reminderMethods.size()) {
2107     // Only if the size of the reminder minutes we've read in is
2108     // the same as the size of the reminder methods. Otherwise,
2109     // something went wrong with bundling them.
2110     reminders = new ArrayList<ReminderEntry>(numReminders);
2111     for (int reminder_i = 0; reminder_i < numReminders;
2112         reminder_i++) {
2113         int minutes = reminderMinutes.get(reminder_i);
2114         int method = reminderMethods.get(reminder_i);
2115         reminders.add(ReminderEntry.valueOf(minutes, method));
2116     }
2117 } else {
2118     Log.d(TAG, String.format("Error resolving reminders." +
2119         " Found %d reminderMinutes, but %d
... reminderMethods.",
2120         numReminders, reminderMethods.size()));
2121 }
2122
2123 return reminders;
2124 }
2125
2126 }
2127
```

EXHIBIT 6

```
1 /*
2  * Copyright (C) 2006 The Android Open Source Project
3  *
4  * Licensed under the Apache License, Version 2.0 (the "License");
5  * you may not use this file except in compliance with the License.
6  * You may obtain a copy of the License at
7  *
8  *     http://www.apache.org/licenses/LICENSE-2.0
9  *
10 * Unless required by applicable law or agreed to in writing, software
11 * distributed under the License is distributed on an "AS IS" BASIS,
12 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or
... implied.
13 * See the License for the specific language governing permissions and
14 * limitations under the License.
15 */
16
17 package android.widget;
18
19 import static
... android.view.accessibility.AccessibilityNodeInfo.
... EXTRA_DATA_TEXT_CHARACTER_LOCATION_ARG_LENGTH;
20 import static
... android.view.accessibility.AccessibilityNodeInfo.
... EXTRA_DATA_TEXT_CHARACTER_LOCATION_ARG_START_INDEX;
21 import static
... android.view.accessibility.AccessibilityNodeInfo.
... EXTRA_DATA_TEXT_CHARACTER_LOCATION_KEY;
22 import static
... android.view.inputmethod.CursorAnchorInfo.FLAG_HAS_VISIBLE_REGION;
23
24 import android.R;
25 import android.annotation.ColorInt;
26 import android.annotation.DrawableRes;
27 import android.annotation.FloatRange;
28 import android.annotation.IntDef;
29 import android.annotation.NonNull;
30 import android.annotation.Nullable;
31 import android.annotation.Size;
32 import android.annotation.StringRes;
33 import android.annotation.StyleRes;
34 import android.annotation.XmlRes;
35 import android.app.Activity;
36 import android.app assist.AssistStructure;
37 import android.content.ClipData;
38 import android.content.ClipDescription;
39 import android.content.ClipboardManager;
40 import android.content.Context;
41 import android.content.Intent;
42 import android.content.UndoManager;
```

```
43 import android.content.res.ColorStateList;
44 import android.content.res.CompatibilityInfo;
45 import android.content.res.Configuration;
46 import android.content.res.Resources;
47 import android.content.res.TypedArray;
48 import android.content.res.XmlResourceParser;
49 import android.graphics.BaseCanvas;
50 import android.graphics.Canvas;
51 import android.graphics.Insets;
52 import android.graphics.Paint;
53 import android.graphics.Path;
54 import android.graphics.PorterDuff;
55 import android.graphics.Rect;
56 import android.graphics.RectF;
57 import android.graphics.Typeface;
58 import android.graphics.drawable.Drawable;
59 import android.graphics.fonts.FontVariationAxis;
60 import android.icu.text.DecimalFormatSymbols;
61 import android.os.AsyncTask;
62 import android.os.Build.VERSION_CODES;
63 import android.os.Bundle;
64 import android.os.LocaleList;
65 import android.os.Parcel;
66 import android.os.Parcelable;
67 import android.os.ParcelableParcel;
68 import android.os.SystemClock;
69 import android.provider.Settings;
70 import android.text.BoringLayout;
71 import android.text.DynamicLayout;
72 import android.text.Editable;
73 import android.text.GetChars;
74 import android.text.GraphicsOperations;
75 import android.text.InputFilter;
76 import android.text.InputType;
77 import android.text.Layout;
78 import android.text.ParcelableSpan;
79 import android.text.Selection;
80 import android.text.SpanWatcher;
81 import android.text.Spannable;
82 import android.text.SpannableStringBuilder;
83 import android.text.Spanned;
84 import android.text.SpannedString;
85 import android.text.StaticLayout;
86 import android.text.TextDirectionHeuristic;
87 import android.text.TextDirectionHeuristics;
88 import android.text.TextPaint;
89 import android.text.TextUtils;
90 import android.text.TextUtils.TruncateAt;
91 import android.text.TextWatcher;
92 import android.text.method.AllCapsTransformationMethod;
```

```
93 import android.text.method.ArrowKeyMovementMethod;
94 import android.text.method.DateKeyListener;
95 import android.text.method.DateTimeKeyListener;
96 import android.text.method.DialerKeyListener;
97 import android.text.method.DigitsKeyListener;
98 import android.text.method.KeyListener;
99 import android.text.method.LinkMovementMethod;
100 import android.text.method.MetaKeyKeyListener;
101 import android.text.method.MovementMethod;
102 import android.text.method.PasswordTransformationMethod;
103 import android.text.method.SingleLineTransformationMethod;
104 import android.text.method.TextKeyListener;
105 import android.text.method.TimeKeyListener;
106 import android.text.method.TransformationMethod;
107 import android.text.method.TransformationMethod2;
108 import android.text.method.WordIterator;
109 import android.text.style.CharacterStyle;
110 import android.text.style.ClickableSpan;
111 import android.text.style.ParagraphStyle;
112 import android.text.style.SpellCheckSpan;
113 import android.text.style.SuggestionSpan;
114 import android.text.style.URLSpan;
115 import android.text.style.UpdateAppearance;
116 import android.text.util.Linkify;
117 import android.util.AttributeSet;
118 import android.util.DisplayMetrics;
119 import android.util.IntArray;
120 import android.util.Log;
121 import android.util.TypedValue;
122 import android.view.AccessibilityIterators.TextSegmentIterator;
123 import android.view.ActionMode;
124 import android.view.Choreographer;
125 import android.view.ContextMenu;
126 import android.view.DragEvent;
127 import android.view.Gravity;
128 import android.view.HapticFeedbackConstants;
129 import android.view.InputDevice;
130 import android.view.KeyCharacterMap;
131 import android.view.KeyEvent;
132 import android.view.MotionEvent;
133 import android.view.PointerIcon;
134 import android.view.View;
135 import android.view.ViewConfiguration;
136 import android.view.ViewDebug;
137 import android.view.ViewGroup.LayoutParams;
138 import android.view.ViewHierarchyEncoder;
139 import android.view.ViewParent;
140 import android.view.ViewRootImpl;
141 import android.view.ViewStructure;
142 import android.view.ViewTreeObserver;
```



```
143 import android.view.accessibility.AccessibilityEvent;
144 import android.view.accessibility.AccessibilityManager;
145 import android.view.accessibility.AccessibilityNodeInfo;
146 import android.view.animation.AnimationUtils;
147 import android.view.autofill.AutofillManager;
148 import android.view.autofill.AutofillValue;
149 import android.view.inputmethod.BaseInputConnection;
150 import android.view.inputmethod.CompletionInfo;
151 import android.view.inputmethod.CorrectionInfo;
152 import android.view.inputmethod.CursorAnchorInfo;
153 import android.view.inputmethod.EditorInfo;
154 import android.view.inputmethod.ExtractedText;
155 import android.view.inputmethod.ExtractedTextRequest;
156 import android.view.inputmethod.InputConnection;
157 import android.view.inputmethod.InputMethodManager;
158 import android.view.textclassifier.TextClassificationManager;
159 import android.view.textclassifier.TextClassifier;
160 import android.view.textservice.SpellCheckerSubtype;
161 import android.view.textservice.TextServicesManager;
162 import android.widget.RemoteViews.RemoteView;
163
164 import com.android.internal.annotations.VisibleForTesting;
165 import com.android.internal.logging.MetricsLogger;
166 import com.android.internal.logging.nano.MetricsProto.MetricsEvent;
167 import com.android.internal.util.FastMath;
168 import com.android.internal.widget.EditableInputConnection;
169
170 import libcore.util.EmptyArray;
171
172 import org.xmlpull.v1.XmlPullParserException;
173
174 import java.io.IOException;
175 import java.lang.annotation.Retention;
176 import java.lang.annotation.RetentionPolicy;
177 import java.lang.ref.WeakReference;
178 import java.util.ArrayList;
179 import java.util.Arrays;
180 import java.util.Locale;
181
182 /**
183  * A user interface element that displays text to the user.
184  * To provide user-editable text, see {@link EditText}.
185  * <p>
186  * The following code sample shows a typical use, with an XML layout
187  * and code to modify the contents of the text view:
188  * </p>
189
190  * <pre>
191  * <LinearLayout
192      xmlns:android="http://schemas.android.com/apk/res/android"
```

```
193     android:layout_width="match_parent"
194     android:layout_height="match_parent">
195     * <TextView
196     *     android:id="@+id/text_view_id"
197     *     android:layout_height="wrap_content"
198     *     android:layout_width="wrap_content"
199     *     android:text="@string/hello" />
200 * </LinearLayout>
201 * </pre>
202 * <p>
203 * This code sample demonstrates how to modify the contents of the text
... view
204 * defined in the previous XML layout:
205 * </p>
206 * <pre>
207 * public class MainActivity extends Activity {
208 *
209 *     protected void onCreate(Bundle savedInstanceState) {
210 *         super.onCreate(savedInstanceState);
211 *         setContentView(R.layout.activity_main);
212 *         final TextView helloTextView = (TextView)
... findViewById(R.id.text_view_id);
213 *         helloTextView.setText(R.string.user_greeting);
214 *     }
215 * }
216 * </pre>
217 * <p>
218 * To customize the appearance of TextView, see <a
... href="https://developer.android.com/guide/topics/ui/themes.html">Styles
... and Themes</a>.
219 * </p>
220 * <p>
221 * <b>XML attributes</b>
222 * <p>
223 * See {@link android.R.styleable#TextView TextView Attributes},
224 * {@link android.R.styleable#View View Attributes}
225 *
226 * @attr ref android.R.styleable#TextView_text
227 * @attr ref android.R.styleable#TextView_bufferType
228 * @attr ref android.R.styleable#TextView_hint
229 * @attr ref android.R.styleable#TextView_textColor
230 * @attr ref android.R.styleable#TextView_textColorHighlight
231 * @attr ref android.R.styleable#TextView_textColorHint
232 * @attr ref android.R.styleable#TextView_textAppearance
233 * @attr ref android.R.styleable#TextView_textColorLink
234 * @attr ref android.R.styleable#TextView_textSize
235 * @attr ref android.R.styleable#TextView_textScaleX
236 * @attr ref android.R.styleable#TextView_fontFamily
237 * @attr ref android.R.styleable#TextView_typeface
238 * @attr ref android.R.styleable#TextView_textStyle
```

239 * @attr ref android.R.styleable#TextView_cursorVisible
240 * @attr ref android.R.styleable#TextView_maxLines
241 * @attr ref android.R.styleable#TextView_maxHeight
242 * @attr ref android.R.styleable#TextView_lines
243 * @attr ref android.R.styleable#TextView_height
244 * @attr ref android.R.styleable#TextView_minLines
245 * @attr ref android.R.styleable#TextView_minHeight
246 * @attr ref android.R.styleable#TextView_maxEms
247 * @attr ref android.R.styleable#TextView_maxWidth
248 * @attr ref android.R.styleable#TextView_ems
249 * @attr ref android.R.styleable#TextView_width
250 * @attr ref android.R.styleable#TextView_minEms
251 * @attr ref android.R.styleable#TextView_minWidth
252 * @attr ref android.R.styleable#TextView_gravity
253 * @attr ref android.R.styleable#TextView_scrollHorizontally
254 * @attr ref android.R.styleable#TextView_password
255 * @attr ref android.R.styleable#TextView_singleLine
256 * @attr ref android.R.styleable#TextView_selectAllOnFocus
257 * @attr ref android.R.styleable#TextView_includeFontPadding
258 * @attr ref android.R.styleable#TextView_maxLength
259 * @attr ref android.R.styleable#TextView_shadowColor
260 * @attr ref android.R.styleable#TextView_shadowDx
261 * @attr ref android.R.styleable#TextView_shadowDy
262 * @attr ref android.R.styleable#TextView_shadowRadius
263 * @attr ref android.R.styleable#TextView_autoLink
264 * @attr ref android.R.styleable#TextView_linksClickable
265 * @attr ref android.R.styleable#TextView_numeric
266 * @attr ref android.R.styleable#TextView_digits
267 * @attr ref android.R.styleable#TextView_phoneNumber
268 * @attr ref android.R.styleable#TextView_inputMethod
269 * @attr ref android.R.styleable#TextView_capitalize
270 * @attr ref android.R.styleable#TextView_autoText
271 * @attr ref android.R.styleable#TextView_editable
272 * @attr ref android.R.styleable#TextView_freezesText
273 * @attr ref android.R.styleable#TextView_ellipsize
274 * @attr ref android.R.styleable#TextView_drawableTop
275 * @attr ref android.R.styleable#TextView_drawableBottom
276 * @attr ref android.R.styleable#TextView_drawableRight
277 * @attr ref android.R.styleable#TextView_drawableLeft
278 * @attr ref android.R.styleable#TextView_drawableStart
279 * @attr ref android.R.styleable#TextView_drawableEnd
280 * @attr ref android.R.styleable#TextView_drawablePadding
281 * @attr ref android.R.styleable#TextView_drawableTint
282 * @attr ref android.R.styleable#TextView_drawableTintMode
283 * @attr ref android.R.styleable#TextView_lineSpacingExtra
284 * @attr ref android.R.styleable#TextView_lineSpacingMultiplier
285 * @attr ref android.R.styleable#TextView_marqueeRepeatLimit
286 * @attr ref android.R.styleable#TextView_inputType
287 * @attr ref android.R.styleable#TextView_imeOptions
288 * @attr ref android.R.styleable#TextView_privateImeOptions

```
289 * @attr ref android.R.styleable#TextView_imeActionLabel
290 * @attr ref android.R.styleable#TextView_imeActionId
291 * @attr ref android.R.styleable#TextView_editorExtras
292 * @attr ref android.R.styleable#TextView_elegantTextHeight
293 * @attr ref android.R.styleable#TextView_letterSpacing
294 * @attr ref android.R.styleable#TextView_fontFeatureSettings
295 * @attr ref android.R.styleable#TextView_breakStrategy
296 * @attr ref android.R.styleable#TextView_hyphenationFrequency
297 * @attr ref android.R.styleable#TextView_autoSizeTextType
298 * @attr ref android.R.styleable#TextView_autoSizeMinTextSize
299 * @attr ref android.R.styleable#TextView_autoSizeMaxTextSize
300 * @attr ref android.R.styleable#TextView_autoSizeStepGranularity
301 * @attr ref android.R.styleable#TextView_autoSizePresetSizes
302 */
303 @RemoteView
304 public class TextView extends View implements
... ViewTreeObserver.OnPreDrawListener {
305     static final String LOG_TAG = "TextView";
306     static final boolean DEBUG_EXTRACT = false;
307     static final boolean DEBUG_AUTOFILL = false;
308     private static final float[] TEMP_POSITION = new float[2];
309
310     // Enum for the "typeface" XML parameter.
311     // TODO: How can we get this from the XML instead of hardcoding it
... here?
312     private static final int SANS = 1;
313     private static final int SERIF = 2;
314     private static final int MONOSPACE = 3;
315
316     // Bitfield for the "numeric" XML parameter.
317     // TODO: How can we get this from the XML instead of hardcoding it
... here?
318     private static final int SIGNED = 2;
319     private static final int DECIMAL = 4;
320
321     /**
322     * Draw marquee text with fading edges as usual
323     */
324     private static final int MARQUEE_FADE_NORMAL = 0;
325
326     /**
327     * Draw marquee text as ellipsize end while inactive instead of with
... the fade.
328     * (Useful for devices where the fade can be expensive if overdone)
329     */
330     private static final int MARQUEE_FADE_SWITCH_SHOW_ELLIPSIS = 1;
331
332     /**
333     * Draw marquee text with fading edges because it is currently
... active/animating.
```

```
334 */
335 private static final int MARQUEE_FADE_SWITCH_SHOW_FADE = 2;
336
337 private static final int LINES = 1;
338 private static final int EMS = LINES;
339 private static final int PIXELS = 2;
340
341 private static final RectF TEMP_RECTF = new RectF();
342
343 /** @hide */
344 static final int VERY_WIDE = 1024 * 1024; // XXX should be much
... larger
345 private static final int ANIMATED_SCROLL_GAP = 250;
346
347 private static final InputFilter[] NO_FILTERS = new InputFilter[0];
348 private static final Spanned EMPTY_SPANNED = new SpannedString("");
349
350 private static final int CHANGE_WATCHER_PRIORITY = 100;
351
352 // New state used to change background based on whether this
... TextView is multiline.
353 private static final int[] MULTILINE_STATE_SET = {
... R.attr.state_multiline };
354
355 // Accessibility action to share selected text.
356 private static final int ACCESSIBILITY_ACTION_SHARE = 0x10000000;
357
358 /**
359  * @hide
360  */
361 // Accessibility action start id for "process text" actions.
362 static final int ACCESSIBILITY_ACTION_PROCESS_TEXT_START_ID =
... 0x10000100;
363
364 /**
365  * @hide
366  */
367 static final int PROCESS_TEXT_REQUEST_CODE = 100;
368
369 /**
370  * Return code of {@link #doKeyDown}.
371  */
372 private static final int KEY_EVENT_NOT_HANDLED = 0;
373 private static final int KEY_EVENT_HANDLED = -1;
374 private static final int KEY_DOWN_HANDLED_BY_KEY_LISTENER = 1;
375 private static final int KEY_DOWN_HANDLED_BY_MOVEMENT_METHOD = 2;
376
377 // System wide time for last cut, copy or text changed action.
378 static long sLastCutCopyOrTextChangedTime;
379
```

```
380 private ColorStateList mTextColor;
381 private ColorStateList mHintTextColor;
382 private ColorStateList mLinkTextColor;
383 @ViewDebug.ExportedProperty(category = "text")
384 private int mCurTextColor;
385 private int mCurHintTextColor;
386 private boolean mFreezesText;
387
388 private Editable.Factory mEditableFactory =
... Editable.Factory.getInstance();
389 private Spannable.Factory mSpannableFactory =
... Spannable.Factory.getInstance();
390
391 private float mShadowRadius, mShadowDx, mShadowDy;
392 private int mShadowColor;
393
394 private boolean mPreDrawRegistered;
395 private boolean mPreDrawListenerDetached;
396
397 private TextClassifier mTextClassifier;
398
399 // A flag to prevent repeated movements from escaping the enclosing
... text view. The idea here is
400 // that if a user is holding down a movement key to traverse text,
... we shouldn't also traverse
401 // the view hierarchy. On the other hand, if the user is using the
... movement key to traverse
402 // views (i.e. the first movement was to traverse out of this view,
... or this view was traversed
403 // into by the user holding the movement key down) then we shouldn't
... prevent the focus from
404 // changing.
405 private boolean mPreventDefaultMovement;
406
407 private TextUtils.TruncateAt mEllipsize;
408
409 static class Drawables {
410     static final int LEFT = 0;
411     static final int TOP = 1;
412     static final int RIGHT = 2;
413     static final int BOTTOM = 3;
414
415     static final int DRAWABLE_NONE = -1;
416     static final int DRAWABLE_RIGHT = 0;
417     static final int DRAWABLE_LEFT = 1;
418
419     final Rect mCompoundRect = new Rect();
420
421     final Drawable[] mShowing = new Drawable[4];
422
```



```
423     ColorStateList mTintList;
424     PorterDuff.Mode mTintMode;
425     boolean mHasTint;
426     boolean mHasTintMode;
427
428     Drawable mDrawableStart, mDrawableEnd, mDrawableError,
... mDrawableTemp;
429     Drawable mDrawableLeftInitial, mDrawableRightInitial;
430
431     boolean mIsRtlCompatibilityMode;
432     boolean mOverride;
433
434     int mDrawableSizeTop, mDrawableSizeBottom, mDrawableSizeLeft,
... mDrawableSizeRight,
435         mDrawableSizeStart, mDrawableSizeEnd,
... mDrawableSizeError, mDrawableSizeTemp;
436
437     int mDrawableWidthTop, mDrawableWidthBottom,
... mDrawableHeightLeft, mDrawableHeightRight,
438         mDrawableHeightStart, mDrawableHeightEnd,
... mDrawableHeightError, mDrawableHeightTemp;
439
440     int mDrawablePadding;
441
442     int mDrawableSaved = DRAWABLE_NONE;
443
444     public Drawables(Context context) {
445         final int targetSdkVersion =
... context.getApplicationInfo().targetSdkVersion;
446         mIsRtlCompatibilityMode = targetSdkVersion <
... VERSION_CODES.JELLY_BEAN_MR1
447             || !context.getApplicationInfo().hasRtlSupport();
448         mOverride = false;
449     }
450
451     /**
452     * @return {@code true} if this object contains metadata that
... needs to
453     *         be retained, {@code false} otherwise
454     */
455     public boolean hasMetadata() {
456         return mDrawablePadding != 0 || mHasTintMode || mHasTint;
457     }
458
459     /**
460     * Updates the list of displayed drawables to account for the
... current
461     * layout direction.
462     *
463     * @param layoutDirection the current layout direction
```



```
464     * @return {@code true} if the displayed drawables changed
465     */
466     public boolean resolveWithLayoutDirection(int layoutDirection) {
467         final Drawable previousLeft = mShowing[Drawables.LEFT];
468         final Drawable previousRight = mShowing[Drawables.RIGHT];
469
470         // First reset "left" and "right" drawables to their initial
... values
471         mShowing[Drawables.LEFT] = mDrawableLeftInitial;
472         mShowing[Drawables.RIGHT] = mDrawableRightInitial;
473
474         if (mIsRtlCompatibilityMode) {
475             // Use "start" drawable as "left" drawable if the "left"
... drawable was not defined
476             if (mDrawableStart != null && mShowing[Drawables.LEFT]
... == null) {
477                 mShowing[Drawables.LEFT] = mDrawableStart;
478                 mDrawableSizeLeft = mDrawableSizeStart;
479                 mDrawableHeightLeft = mDrawableHeightStart;
480             }
481             // Use "end" drawable as "right" drawable if the "right"
... drawable was not defined
482             if (mDrawableEnd != null && mShowing[Drawables.RIGHT] ==
... null) {
483                 mShowing[Drawables.RIGHT] = mDrawableEnd;
484                 mDrawableSizeRight = mDrawableSizeEnd;
485                 mDrawableHeightRight = mDrawableHeightEnd;
486             }
487         } else {
488             // JB-MR1+ normal case: "start" / "end" drawables are
... overriding "left" / "right"
489             // drawable if and only if they have been defined
490             switch(layoutDirection) {
491                 case LAYOUT_DIRECTION_RTL:
492                     if (mOverride) {
493                         mShowing[Drawables.RIGHT] = mDrawableStart;
494                         mDrawableSizeRight = mDrawableSizeStart;
495                         mDrawableHeightRight = mDrawableHeightStart;
496
497                         mShowing[Drawables.LEFT] = mDrawableEnd;
498                         mDrawableSizeLeft = mDrawableSizeEnd;
499                         mDrawableHeightLeft = mDrawableHeightEnd;
500                     }
501                     break;
502
503                 case LAYOUT_DIRECTION_LTR:
504                 default:
505                     if (mOverride) {
506                         mShowing[Drawables.LEFT] = mDrawableStart;
507                         mDrawableSizeLeft = mDrawableSizeStart;
```

```
508         mDrawableHeightLeft = mDrawableHeightStart;
509
510         mShowing[Drawables.RIGHT] = mDrawableEnd;
511         mDrawableSizeRight = mDrawableSizeEnd;
512         mDrawableHeightRight = mDrawableHeightEnd;
513     }
514     break;
515 }
516 }
517
518     applyErrorDrawableIfNeeded(layoutDirection);
519
520     return mShowing[Drawables.LEFT] != previousLeft
521         || mShowing[Drawables.RIGHT] != previousRight;
522 }
523
524 public void setErrorDrawable(Drawable dr, TextView tv) {
525     if (mDrawableError != dr && mDrawableError != null) {
526         mDrawableError.setCallback(null);
527     }
528     mDrawableError = dr;
529
530     if (mDrawableError != null) {
531         final Rect compoundRect = mCompoundRect;
532         final int[] state = tv.getDrawableState();
533
534         mDrawableError.setState(state);
535         mDrawableError.copyBounds(compoundRect);
536         mDrawableError.setCallback(tv);
537         mDrawableSizeError = compoundRect.width();
538         mDrawableHeightError = compoundRect.height();
539     } else {
540         mDrawableSizeError = mDrawableHeightError = 0;
541     }
542 }
543
544 private void applyErrorDrawableIfNeeded(int layoutDirection) {
545     // first restore the initial state if needed
546     switch (mDrawableSaved) {
547         case DRAWABLE_LEFT:
548             mShowing[Drawables.LEFT] = mDrawableTemp;
549             mDrawableSizeLeft = mDrawableSizeTemp;
550             mDrawableHeightLeft = mDrawableHeightTemp;
551             break;
552         case DRAWABLE_RIGHT:
553             mShowing[Drawables.RIGHT] = mDrawableTemp;
554             mDrawableSizeRight = mDrawableSizeTemp;
555             mDrawableHeightRight = mDrawableHeightTemp;
556             break;
557         case DRAWABLE_NONE:
```

```
558         default:
559     }
560     // then, if needed, assign the Error drawable to the correct
... location
561     if (mDrawableError != null) {
562         switch(layoutDirection) {
563             case LAYOUT_DIRECTION_RTL:
564                 mDrawableSaved = DRAWABLE_LEFT;
565
566                 mDrawableTemp = mShowing[Drawables.LEFT];
567                 mDrawableSizeTemp = mDrawableSizeLeft;
568                 mDrawableHeightTemp = mDrawableHeightLeft;
569
570                 mShowing[Drawables.LEFT] = mDrawableError;
571                 mDrawableSizeLeft = mDrawableSizeError;
572                 mDrawableHeightLeft = mDrawableHeightError;
573                 break;
574             case LAYOUT_DIRECTION_LTR:
575             default:
576                 mDrawableSaved = DRAWABLE_RIGHT;
577
578                 mDrawableTemp = mShowing[Drawables.RIGHT];
579                 mDrawableSizeTemp = mDrawableSizeRight;
580                 mDrawableHeightTemp = mDrawableHeightRight;
581
582                 mShowing[Drawables.RIGHT] = mDrawableError;
583                 mDrawableSizeRight = mDrawableSizeError;
584                 mDrawableHeightRight = mDrawableHeightError;
585                 break;
586         }
587     }
588 }
589 }
590
591 Drawables mDrawables;
592
593 private CharWrapper mCharWrapper;
594
595 private Marquee mMarquee;
596 private boolean mRestartMarquee;
597
598 private int mMarqueeRepeatLimit = 3;
599
600 private int mLastLayoutDirection = -1;
601
602 /**
603  * On some devices the fading edges add a performance penalty if
... used
604  * extensively in the same layout. This mode indicates how the
... marquee
```

```
605 * is currently being shown, if applicable. (mEllipsize will ==
... MARQUEE)
606 */
607 private int mMarqueeFadeMode = MARQUEE_FADE_NORMAL;
608
609 /**
610 * When mMarqueeFadeMode is not MARQUEE_FADE_NORMAL, this stores
611 * the layout that should be used when the mode switches.
612 */
613 private Layout mSavedMarqueeModeLayout;
614
615 @ViewDebug.ExportedProperty(category = "text")
616 private CharSequence mText;
617 private CharSequence mTransformed;
618 private BufferType mBufferType = BufferType.NORMAL;
619
620 private CharSequence mHint;
621 private Layout mHintLayout;
622
623 private MovementMethod mMovement;
624
625 private TransformationMethod mTransformation;
626 private boolean mAllowTransformationLengthChange;
627 private ChangeWatcher mChangeWatcher;
628
629 private ArrayList<TextWatcher> mListeners;
630
631 // display attributes
632 private final TextPaint mTextPaint;
633 private boolean mUserSetTextScaleX;
634 private Layout mLayout;
635 private boolean mLocalesChanged = false;
636
637 // True if setKeyListener() has been explicitly called
638 private boolean mListenerChanged = false;
639 // True if internationalized input should be used for numbers and
... date and time.
640 private final boolean mUseInternationalizedInput;
641
642 @ViewDebug.ExportedProperty(category = "text")
643 private int mGravity = Gravity.TOP | Gravity.START;
644 private boolean mHorizontallyScrolling;
645
646 private int mAutoLinkMask;
647 private boolean mLinksClickable = true;
648
649 private float mSpacingMult = 1.0f;
650 private float mSpacingAdd = 0.0f;
651
652 private int mBreakStrategy;
```

```
653 private int mHyphenationFrequency;
654 private int mJustificationMode;
655
656 private int mMaximum = Integer.MAX_VALUE;
657 private int mMaxMode = LINES;
658 private int mMinimum = 0;
659 private int mMinMode = LINES;
660
661 private int mOldMaximum = mMaximum;
662 private int mOldMaxMode = mMaxMode;
663
664 private int mMaxWidth = Integer.MAX_VALUE;
665 private int mMaxWidthMode = PIXELS;
666 private int mMinWidth = 0;
667 private int mMinWidthMode = PIXELS;
668
669 private boolean mSingleLine;
670 private int mDesiredHeightAtMeasure = -1;
671 private boolean mIncludePad = true;
672 private int mDeferScroll = -1;
673
674 // tmp primitives, so we don't alloc them on each draw
675 private Rect mTempRect;
676 private long mLastScroll;
677 private Scroller mScroller;
678 private TextPaint mTempTextPaint;
679
680 private BoringLayout.Metrics mBoring, mHintBoring;
681 private BoringLayout mSavedLayout, mSavedHintLayout;
682
683 private TextDirectionHeuristic mTextDir;
684
685 private InputFilter[] mFilters = NO_FILTERS;
686
687 private volatile Locale mCurrentSpellCheckerLocaleCache;
688
689 // It is possible to have a selection even when mEditor is null
... (programmatically set, like when
690 // a link is pressed). These highlight-related fields do not go in
... mEditor.
691 int mHighlightColor = 0x6633B5E5;
692 private Path mHighlightPath;
693 private final Paint mHighlightPaint;
694 private boolean mHighlightPathBogus = true;
695
696 // Although these fields are specific to editable text, they are not
... added to Editor because
697 // they are defined by the TextView's style and are theme-dependent.
698 int mCursorDrawableRes;
699 // These six fields, could be moved to Editor, since we know their
```

```
699... default values and we
700 // could condition the creation of the Editor to a non standard
... value. This is however
701 // brittle since the hardcoded values here (such as
702 // com.android.internal.R.drawable.text_select_handle_left) would
... have to be updated if the
703 // default style is modified.
704 int mTextSelectHandleLeftRes;
705 int mTextSelectHandleRightRes;
706 int mTextSelectHandleRes;
707 int mTextEditSuggestionItemLayout;
708 int mTextEditSuggestionContainerLayout;
709 int mTextEditSuggestionHighlightStyle;
710
711 /**
712 * {@link EditText} specific data, created on demand when one of the
... Editor fields is used.
713 * See {@link #createEditorIfNeeded()}.
714 */
715 private Editor mEditor;
716
717 private static final int DEVICE_PROVISIONED_UNKNOWN = 0;
718 private static final int DEVICE_PROVISIONED_NO = 1;
719 private static final int DEVICE_PROVISIONED_YES = 2;
720
721 /**
722 * Some special options such as sharing selected text should only be
... shown if the device
723 * is provisioned. Only check the provisioned state once for a given
... view instance.
724 */
725 private int mDeviceProvisionedState = DEVICE_PROVISIONED_UNKNOWN;
726
727 /**
728 * The TextView does not auto-size text (default).
729 */
730 public static final int AUTO_SIZE_TEXT_TYPE_NONE = 0;
731
732 /**
733 * The TextView scales text size both horizontally and vertically to
... fit within the
734 * container.
735 */
736 public static final int AUTO_SIZE_TEXT_TYPE_UNIFORM = 1;
737
738 /** @hide */
739 @IntDef({AUTO_SIZE_TEXT_TYPE_NONE, AUTO_SIZE_TEXT_TYPE_UNIFORM})
740 @Retention(RetentionPolicy.SOURCE)
741 public @interface AutoSizeTextType {}
742 // Default minimum size for auto-sizing text in scaled pixels.
```

```
743 private static final int DEFAULT_AUTO_SIZE_MIN_TEXT_SIZE_IN_SP = 12;
744 // Default maximum size for auto-sizing text in scaled pixels.
745 private static final int DEFAULT_AUTO_SIZE_MAX_TEXT_SIZE_IN_SP =
... 112;
746 // Default value for the step size in pixels.
747 private static final int DEFAULT_AUTO_SIZE_GRANULARITY_IN_PX = 1;
748 // Use this to specify that any of the auto-size configuration int
... values have not been set.
749 private static final float
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE = -1f;
750 // Auto-size text type.
751 private int mAutoSizeTextType = AUTO_SIZE_TEXT_TYPE_NONE;
752 // Specify if auto-size text is needed.
753 private boolean mNeedsAutoSizeText = false;
754 // Step size for auto-sizing in pixels.
755 private float mAutoSizeStepGranularityInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
756 // Minimum text size for auto-sizing in pixels.
757 private float mAutoSizeMinTextSizeInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
758 // Maximum text size for auto-sizing in pixels.
759 private float mAutoSizeMaxTextSizeInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
760 // Contains a (specified or computed) distinct sorted set of text
... sizes in pixels to pick from
761 // when auto-sizing text.
762 private int[] mAutoSizeTextSizesInPx = EmptyArray.INT;
763 // Specifies whether auto-size should use the provided auto size
... steps set or if it should
764 // build the steps set using mAutoSizeMinTextSizeInPx,
... mAutoSizeMaxTextSizeInPx and
765 // mAutoSizeStepGranularityInPx.
766 private boolean mHasPresetAutoSizeValues = false;
767
768 // Indicates whether the text was set from resources or dynamically,
... so it can be used to
769 // sanitize autofill requests.
770 private boolean mTextFromResource = false;
771
772 /**
773 * Kick-start the font cache for the zygote process (to pay the cost
... of
774 * initializing freetype for our default font only once).
775 * @hide
776 */
777 public static void preloadFontCache() {
778     Paint p = new Paint();
779     p.setAntiAlias(true);
780     // Ensure that the Typeface is loaded here.
781     // Typically, Typeface is preloaded by zygote but not on all
```



```

781... devices, e.g. Android Auto.
782     // So, sets Typeface.DEFAULT explicitly here for ensuring that
... the Typeface is loaded here
783     // since Paint.measureText can not be called without Typeface
... static initializer.
784     p.setTypeface(Typeface.DEFAULT);
785     // We don't care about the result, just the side-effect of
... measuring.
786     p.measureText("H");
787 }
788
789 /**
790  * Interface definition for a callback to be invoked when an action
... is
791  * performed on the editor.
792  */
793 public interface OnEditorActionListener {
794     /**
795     * Called when an action is being performed.
796     *
797     * @param v The view that was clicked.
798     * @param actionId Identifier of the action. This will be
... either the
799     * identifier you supplied, or {@link EditorInfo#IME_NULL
800     * EditorInfo.IME_NULL} if being called due to the enter key
801     * being pressed.
802     * @param event If triggered by an enter key, this is the event;
803     * otherwise, this is null.
804     * @return Return true if you have consumed the action, else
... false.
805     */
806     boolean onEditorAction(TextView v, int actionId, KeyEvent
... event);
807 }
808
809 public TextView(Context context) {
810     this(context, null);
811 }
812
813 public TextView(Context context, @Nullable AttributeSet attrs) {
814     this(context, attrs, com.android.internal.R.attr.textViewStyle);
815 }
816
817 public TextView(Context context, @Nullable AttributeSet attrs, int
... defStyleAttr) {
818     this(context, attrs, defStyleAttr, 0);
819 }
820
821 @SuppressWarnings("deprecation")
822 public TextView(

```

```
823 Context context, @Nullable AttributeSet attrs, int
... defStyleAttr, int defStyleRes) {
824     super(context, attrs, defStyleAttr, defStyleRes);
825
826     // TextView is important by default, unless app developer
... overrode attribute.
827     if (getImportantForAutofill() == IMPORTANT_FOR_AUTOFILL_AUTO) {
828         setImportantForAutofill(IMPORTANT_FOR_AUTOFILL_YES);
829     }
830
831     mText = "";
832
833     final Resources res = getResources();
834     final CompatibilityInfo compat = res.getCompatibilityInfo();
835
836     mTextPaint = new TextPaint(Paint.ANTI_ALIAS_FLAG);
837     mTextPaint.density = res.getDisplayMetrics().density;
838     mTextPaint.setCompatibilityScaling(compat.applicationScale);
839
840     mHighlightPaint = new Paint(Paint.ANTI_ALIAS_FLAG);
841
... mHighlightPaint.setCompatibilityScaling(compat.applicationScale);
842
843     mMovement = getDefaultMovementMethod();
844
845     mTransformation = null;
846
847     int textColorHighlight = 0;
848     ColorStateList textColor = null;
849     ColorStateList textColorHint = null;
850     ColorStateList textColorLink = null;
851     int textSize = 15;
852     String fontFamily = null;
853     Typeface fontTypeface = null;
854     boolean fontFamilyExplicit = false;
855     int typefaceIndex = -1;
856     int styleIndex = -1;
857     boolean allCaps = false;
858     int shadowcolor = 0;
859     float dx = 0, dy = 0, r = 0;
860     boolean elegant = false;
861     float letterSpacing = 0;
862     String fontFeatureSettings = null;
863     mBreakStrategy = Layout.BREAK_STRATEGY_SIMPLE;
864     mHyphenationFrequency = Layout.HYPHENATION_FREQUENCY_NONE;
865     mJustificationMode = Layout.JUSTIFICATION_MODE_NONE;
866
867     final Resources.Theme theme = context.getTheme();
868
869     /*
```

```
870     * Look the appearance up without checking first if it exists
... because
871     * almost every TextView has one and it greatly simplifies the
... logic
872     * to be able to parse the appearance first and then let
... specific tags
873     * for this View override it.
874     */
875     TypedArray a = theme.obtainStyledAttributes(attrs,
876         com.android.internal.R.styleable.TextViewAppearance,
... defStyleAttr, defStyleAttr);
877     TypedArray appearance = null;
878     int ap = a.getResourceId(
879
... com.android.internal.R.styleable.TextViewAppearance_textAppearance, -1);
880     a.recycle();
881     if (ap != -1) {
882         appearance = theme.obtainStyledAttributes(
883             ap,
... com.android.internal.R.styleable.TextAppearance);
884     }
885     if (appearance != null) {
886         int n = appearance.getIndexCount();
887         for (int i = 0; i < n; i++) {
888             int attr = appearance.getIndex(i);
889
890             switch (attr) {
891                 case
... com.android.internal.R.styleable.TextAppearance_textColorHighlight:
892                     textColorHighlight = appearance.getColor(attr,
... textColorHighlight);
893                     break;
894
895                 case
... com.android.internal.R.styleable.TextAppearance_textColor:
896                     textColor = appearance.getColorStateList(attr);
897                     break;
898
899                 case
... com.android.internal.R.styleable.TextAppearance_textColorHint:
900                     textColorHint =
... appearance.getColorStateList(attr);
901                     break;
902
903                 case
... com.android.internal.R.styleable.TextAppearance_textColorLink:
904                     textColorLink =
... appearance.getColorStateList(attr);
905                     break;
906
```

```
907     case
... com.android.internal.R.styleable.TextAppearance_textSize:
908         textSize =
... appearance.getDimensionPixelSize(attr, textSize);
909         break;
910
911     case
... com.android.internal.R.styleable.TextAppearance_typeface:
912         typefaceIndex = appearance.getInt(attr, -1);
913         break;
914
915     case
... com.android.internal.R.styleable.TextAppearance_fontFamily:
916         if (!context.isRestricted() &&
... context.canLoadUnsafeResources()) {
917             try {
918                 fontTypeface = appearance.getFont(attr);
919             } catch (UnsupportedOperationException
920                 | Resources.NotFoundException e) {
921                 // Expected if it is not a font
... resource.
922             }
923         }
924         if (fontTypeface == null) {
925             fontFamily = appearance.getString(attr);
926         }
927         break;
928
929     case
... com.android.internal.R.styleable.TextAppearance_textStyle:
930         styleIndex = appearance.getInt(attr, -1);
931         break;
932
933     case
... com.android.internal.R.styleable.TextAppearance_textAllCaps:
934         allCaps = appearance.getBoolean(attr, false);
935         break;
936
937     case
... com.android.internal.R.styleable.TextAppearance_shadowColor:
938         shadowcolor = appearance.getInt(attr, 0);
939         break;
940
941     case
... com.android.internal.R.styleable.TextAppearance_shadowDx:
942         dx = appearance.getFloat(attr, 0);
943         break;
944
945     case
... com.android.internal.R.styleable.TextAppearance_shadowDy:
```

```
946         dy = appearance.getFloat(attr, 0);
947         break;
948
949         case
... com.android.internal.R.styleable.TextAppearance_shadowRadius:
950             r = appearance.getFloat(attr, 0);
951             break;
952
953         case
... com.android.internal.R.styleable.TextAppearance_elegantTextHeight:
954             elegant = appearance.getBoolean(attr, false);
955             break;
956
957         case
... com.android.internal.R.styleable.TextAppearance_letterSpacing:
958             letterSpacing = appearance.getFloat(attr, 0);
959             break;
960
961         case
... com.android.internal.R.styleable.TextAppearance_fontFeatureSettings:
962             fontFeatureSettings =
... appearance.getString(attr);
963             break;
964     }
965 }
966
967     appearance.recycle();
968 }
969
970     boolean editable = getDefaultEditable();
971     CharSequence inputMethod = null;
972     int numeric = 0;
973     CharSequence digits = null;
974     boolean phone = false;
975     boolean autotext = false;
976     int autocap = -1;
977     int buffertype = 0;
978     boolean selectallonfocus = false;
979     Drawable drawableLeft = null, drawableTop = null, drawableRight
... = null,
980         drawableBottom = null, drawableStart = null, drawableEnd
... = null;
981     ColorStateList drawableTint = null;
982     PorterDuff.Mode drawableTintMode = null;
983     int drawablePadding = 0;
984     int ellipsize = -1;
985     boolean singleLine = false;
986     int maxlength = -1;
987     CharSequence text = "";
988     CharSequence hint = null;
```

```
989     boolean password = false;
990     float autoSizeMinTextSizeInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
991     float autoSizeMaxTextSizeInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
992     float autoSizeStepGranularityInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
993     int inputType = EditorInfo.TYPE_NULL;
994     a = theme.obtainStyledAttributes(
995         attrs, com.android.internal.R.styleable.TextView,
... defStyleAttr, defStyleRes);
996
997     int n = a.getIndexCount();
998
999     boolean fromResourceId = false;
1000     for (int i = 0; i < n; i++) {
1001         int attr = a.getIndex(i);
1002
1003         switch (attr) {
1004             case com.android.internal.R.styleable.TextView_editable:
1005                 editable = a.getBoolean(attr, editable);
1006                 break;
1007
1008             case
... com.android.internal.R.styleable.TextView_inputMethod:
1009                 inputMethod = a.getText(attr);
1010                 break;
1011
1012             case com.android.internal.R.styleable.TextView_numeric:
1013                 numeric = a.getInt(attr, numeric);
1014                 break;
1015
1016             case com.android.internal.R.styleable.TextView_digits:
1017                 digits = a.getText(attr);
1018                 break;
1019
1020             case
... com.android.internal.R.styleable.TextView_phoneNumber:
1021                 phone = a.getBoolean(attr, phone);
1022                 break;
1023
1024             case com.android.internal.R.styleable.TextView_autoText:
1025                 autotext = a.getBoolean(attr, autotext);
1026                 break;
1027
1028             case
... com.android.internal.R.styleable.TextView_capitalize:
1029                 autocap = a.getInt(attr, autocap);
1030                 break;
1031
```

```
1032     case
... com.android.internal.R.styleable.TextView_bufferType:
1033         buffertype = a.getInt(attr, buffertype);
1034         break;
1035
1036     case
... com.android.internal.R.styleable.TextView_selectAllOnFocus:
1037         selectallonfocus = a.getBoolean(attr,
... selectallonfocus);
1038         break;
1039
1040     case com.android.internal.R.styleable.TextView_autoLink:
1041         mAutoLinkMask = a.getInt(attr, 0);
1042         break;
1043
1044     case
... com.android.internal.R.styleable.TextView_linksClickable:
1045         mLinksClickable = a.getBoolean(attr, true);
1046         break;
1047
1048     case
... com.android.internal.R.styleable.TextView_drawableLeft:
1049         drawableLeft = a.getDrawable(attr);
1050         break;
1051
1052     case
... com.android.internal.R.styleable.TextView_drawableTop:
1053         drawableTop = a.getDrawable(attr);
1054         break;
1055
1056     case
... com.android.internal.R.styleable.TextView_drawableRight:
1057         drawableRight = a.getDrawable(attr);
1058         break;
1059
1060     case
... com.android.internal.R.styleable.TextView_drawableBottom:
1061         drawableBottom = a.getDrawable(attr);
1062         break;
1063
1064     case
... com.android.internal.R.styleable.TextView_drawableStart:
1065         drawableStart = a.getDrawable(attr);
1066         break;
1067
1068     case
... com.android.internal.R.styleable.TextView_drawableEnd:
1069         drawableEnd = a.getDrawable(attr);
1070         break;
1071
```



```
1072     case
... com.android.internal.R.styleable.TextView_drawableTint:
1073         drawableTint = a.getColorStateList(attr);
1074         break;
1075
1076     case
... com.android.internal.R.styleable.TextView_drawableTintMode:
1077         drawableTintMode =
... Drawable.parseTintMode(a.getInt(attr, -1), drawableTintMode);
1078         break;
1079
1080     case
... com.android.internal.R.styleable.TextView_drawablePadding:
1081         drawablePadding = a.getDimensionPixelSize(attr,
... drawablePadding);
1082         break;
1083
1084     case com.android.internal.R.styleable.TextView_maxLines:
1085         setMaxLines(a.getInt(attr, -1));
1086         break;
1087
1088     case
... com.android.internal.R.styleable.TextView_maxHeight:
1089         setMaxHeight(a.getDimensionPixelSize(attr, -1));
1090         break;
1091
1092     case com.android.internal.R.styleable.TextView_lines:
1093         setLines(a.getInt(attr, -1));
1094         break;
1095
1096     case com.android.internal.R.styleable.TextView_height:
1097         setHeight(a.getDimensionPixelSize(attr, -1));
1098         break;
1099
1100     case com.android.internal.R.styleable.TextView_minLines:
1101         setMinLines(a.getInt(attr, -1));
1102         break;
1103
1104     case
... com.android.internal.R.styleable.TextView_minHeight:
1105         setMinHeight(a.getDimensionPixelSize(attr, -1));
1106         break;
1107
1108     case com.android.internal.R.styleable.TextView_maxEms:
1109         setMaxEms(a.getInt(attr, -1));
1110         break;
1111
1112     case com.android.internal.R.styleable.TextView_maxWidth:
1113         setMaxWidth(a.getDimensionPixelSize(attr, -1));
1114         break;
```

```
1115
1116     case com.android.internal.R.styleable.TextView_ems:
1117         setEms(a.getInt(attr, -1));
1118         break;
1119
1120     case com.android.internal.R.styleable.TextView_width:
1121         setWidth(a.getDimensionPixelSize(attr, -1));
1122         break;
1123
1124     case com.android.internal.R.styleable.TextView_minEms:
1125         setMinEms(a.getInt(attr, -1));
1126         break;
1127
1128     case com.android.internal.R.styleable.TextView_minWidth:
1129         setMinWidth(a.getDimensionPixelSize(attr, -1));
1130         break;
1131
1132     case com.android.internal.R.styleable.TextView_gravity:
1133         setGravity(a.getInt(attr, -1));
1134         break;
1135
1136     case com.android.internal.R.styleable.TextView_hint:
1137         hint = a.getText(attr);
1138         break;
1139
1140     case com.android.internal.R.styleable.TextView_text:
1141         fromResourceId = true;
1142         text = a.getText(attr);
1143         break;
1144
1145     case
1146 ... com.android.internal.R.styleable.TextView_scrollHorizontally:
1147         if (a.getBoolean(attr, false)) {
1148             setHorizontallyScrolling(true);
1149         }
1150         break;
1151
1152     case
1153 ... com.android.internal.R.styleable.TextView_singleLine:
1154         singleLine = a.getBoolean(attr, singleLine);
1155         break;
1156
1157     case
1158 ... com.android.internal.R.styleable.TextView_ellipsize:
1159         ellipsize = a.getInt(attr, ellipsize);
1160         break;
1161
1162     case
1163 ... com.android.internal.R.styleable.TextView_marqueeRepeatLimit:
1164         setMarqueeRepeatLimit(a.getInt(attr,
```

```
1160... mMarqueeRepeatLimit));
1161         break;
1162
1163         case
... com.android.internal.R.styleable.TextView_includeFontPadding:
1164         if (!a.getBoolean(attr, true)) {
1165             setIncludeFontPadding(false);
1166         }
1167         break;
1168
1169         case
... com.android.internal.R.styleable.TextView_cursorVisible:
1170         if (!a.getBoolean(attr, true)) {
1171             setCursorVisible(false);
1172         }
1173         break;
1174
1175         case
... com.android.internal.R.styleable.TextView_maxLength:
1176         maxlength = a.getInt(attr, -1);
1177         break;
1178
1179         case
... com.android.internal.R.styleable.TextView_textScaleX:
1180         setTextScaleX(a.getFloat(attr, 1.0f));
1181         break;
1182
1183         case
... com.android.internal.R.styleable.TextView_freezesText:
1184         mFreezesText = a.getBoolean(attr, false);
1185         break;
1186
1187         case
... com.android.internal.R.styleable.TextView_shadowColor:
1188         shadowcolor = a.getInt(attr, 0);
1189         break;
1190
1191         case com.android.internal.R.styleable.TextView_shadowDx:
1192         dx = a.getFloat(attr, 0);
1193         break;
1194
1195         case com.android.internal.R.styleable.TextView_shadowDy:
1196         dy = a.getFloat(attr, 0);
1197         break;
1198
1199         case
... com.android.internal.R.styleable.TextView_shadowRadius:
1200         r = a.getFloat(attr, 0);
1201         break;
1202
```

```
1203     case com.android.internal.R.styleable.TextView_enabled:
1204         setEnabled(a.getBoolean(attr, isEnabled()));
1205         break;
1206
1207     case
... com.android.internal.R.styleable.TextView_textColorHighlight:
1208         textColorHighlight = a.getColor(attr,
... textColorHighlight);
1209         break;
1210
1211     case
... com.android.internal.R.styleable.TextView_textColor:
1212         textColor = a.getColorStateList(attr);
1213         break;
1214
1215     case
... com.android.internal.R.styleable.TextView_textColorHint:
1216         textColorHint = a.getColorStateList(attr);
1217         break;
1218
1219     case
... com.android.internal.R.styleable.TextView_textColorLink:
1220         textColorLink = a.getColorStateList(attr);
1221         break;
1222
1223     case com.android.internal.R.styleable.TextView_textSize:
1224         textSize = a.getDimensionPixelSize(attr, textSize);
1225         break;
1226
1227     case com.android.internal.R.styleable.TextView_typeface:
1228         typefaceIndex = a.getInt(attr, typefaceIndex);
1229         break;
1230
1231     case
... com.android.internal.R.styleable.TextView_textStyle:
1232         styleIndex = a.getInt(attr, styleIndex);
1233         break;
1234
1235     case
... com.android.internal.R.styleable.TextView_fontFamily:
1236         if (!context.isRestricted() &&
... context.canLoadUnsafeResources()) {
1237             try {
1238                 fontTypeface = a.getFont(attr);
1239             } catch (UnsupportedOperationException |
... Resources.NotFoundException e) {
1240                 // Expected if it is not a resource
... reference or if it is a reference to
1241                 // another resource type.
1242             }
```

```
1243     }
1244     if (fontTypeface == null) {
1245         fontFamily = a.getString(attr);
1246     }
1247     fontFamilyExplicit = true;
1248     break;
1249
1250     case com.android.internal.R.styleable.TextView_password:
1251         password = a.getBoolean(attr, password);
1252         break;
1253
1254     case
1255     com.android.internal.R.styleable.TextView_lineSpacingExtra:
1256         mSpacingAdd = a.getDimensionPixelSize(attr, (int)
1257     mSpacingAdd);
1258         break;
1259
1260     case
1261     com.android.internal.R.styleable.TextView_lineSpacingMultiplier:
1262         mSpacingMult = a.getFloat(attr, mSpacingMult);
1263         break;
1264
1265     case
1266     com.android.internal.R.styleable.TextView_inputType:
1267         inputType = a.getInt(attr, EditorInfo.TYPE_NULL);
1268         break;
1269
1270     case
1271     com.android.internal.R.styleable.TextView_allowUndo:
1272         createEditorIfNeeded();
1273         mEditor.mAllowUndo = a.getBoolean(attr, true);
1274         break;
1275
1276     case
1277     com.android.internal.R.styleable.TextView_imeOptions:
1278         createEditorIfNeeded();
1279         mEditor.createInputContentTypeIfNeeded();
1280         mEditor.mInputContentType.imeOptions =
1281     a.getInt(attr,
1282         mEditor.mInputContentType.imeOptions);
1283         break;
1284
1285     case
1286     com.android.internal.R.styleable.TextView_imeActionLabel:
1287         createEditorIfNeeded();
1288         mEditor.createInputContentTypeIfNeeded();
1289         mEditor.mInputContentType.imeActionLabel =
1290     a.getText(attr);
1291         break;
```

```
1284         case
... com.android.internal.R.styleable.TextView_imeActionId:
1285             createEditorIfNeeded();
1286             mEditor.createInputContentTypeIfNeeded();
1287             mEditor.mInputContentType.imeActionId =
... a.getInt(attr,
1288                 mEditor.mInputContentType.imeActionId);
1289             break;
1290
1291         case
... com.android.internal.R.styleable.TextView_privateImeOptions:
1292             setPrivateImeOptions(a.getString(attr));
1293             break;
1294
1295         case
... com.android.internal.R.styleable.TextView_editorExtras:
1296             try {
1297                 setInputExtras(a.getResourceId(attr, 0));
1298             } catch (XmlPullParserException e) {
1299                 Log.w(LOG_TAG, "Failure reading input extras",
... e);
1300             } catch (IOException e) {
1301                 Log.w(LOG_TAG, "Failure reading input extras",
... e);
1302             }
1303             break;
1304
1305         case
... com.android.internal.R.styleable.TextView_textCursorDrawable:
1306             mCursorDrawableRes = a.getResourceId(attr, 0);
1307             break;
1308
1309         case
... com.android.internal.R.styleable.TextView_textSelectHandleLeft:
1310             mTextSelectHandleLeftRes = a.getResourceId(attr, 0);
1311             break;
1312
1313         case
... com.android.internal.R.styleable.TextView_textSelectHandleRight:
1314             mTextSelectHandleRightRes = a.getResourceId(attr,
... 0);
1315             break;
1316
1317         case
... com.android.internal.R.styleable.TextView_textSelectHandle:
1318             mTextSelectHandleRes = a.getResourceId(attr, 0);
1319             break;
1320
1321         case
... com.android.internal.R.styleable.TextView_textEditSuggestionItemLayout:
```

```
1322         mTextEditSuggestionItemLayout =
...     a.getResourceId(attr, 0);
1323         break;
1324
1325         case
...     com.android.internal.R.styleable.
...     TextView_textEditSuggestionContainerLayout:
1326         mTextEditSuggestionContainerLayout =
...     a.getResourceId(attr, 0);
1327         break;
1328
1329         case
...     com.android.internal.R.styleable.
...     TextView_textEditSuggestionHighlightStyle:
1330         mTextEditSuggestionHighlightStyle =
...     a.getResourceId(attr, 0);
1331         break;
1332
1333         case
...     com.android.internal.R.styleable.TextView_textIsSelectable:
1334         setTextIsSelectable(a.getBoolean(attr, false));
1335         break;
1336
1337         case
...     com.android.internal.R.styleable.TextView_textAllCaps:
1338         allCaps = a.getBoolean(attr, false);
1339         break;
1340
1341         case
...     com.android.internal.R.styleable.TextView_elegantTextHeight:
1342         elegant = a.getBoolean(attr, false);
1343         break;
1344
1345         case
...     com.android.internal.R.styleable.TextView_letterSpacing:
1346         letterSpacing = a.getFloat(attr, 0);
1347         break;
1348
1349         case
...     com.android.internal.R.styleable.TextView_fontFeatureSettings:
1350         fontFeatureSettings = a.getString(attr);
1351         break;
1352
1353         case
...     com.android.internal.R.styleable.TextView_breakStrategy:
1354         mBreakStrategy = a.getInt(attr,
...     Layout.BREAK_STRATEGY_SIMPLE);
1355         break;
1356
1357         case
```



```
1357... com.android.internal.R.styleable.TextView_hyphenationFrequency:
1358         mHyphenationFrequency = a.getInt(attr,
... Layout.HYPHENATION_FREQUENCY_NONE);
1359         break;
1360
1361         case
... com.android.internal.R.styleable.TextView_autoSizeTextType:
1362         mAutoSizeTextType = a.getInt(attr,
... AUTO_SIZE_TEXT_TYPE_NONE);
1363         break;
1364
1365         case
... com.android.internal.R.styleable.TextView_autoSizeStepGranularity:
1366         autoSizeStepGranularityInPx = a.getDimension(attr,
1367             UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE);
1368         break;
1369
1370         case
... com.android.internal.R.styleable.TextView_autoSizeMinTextSize:
1371         autoSizeMinTextSizeInPx = a.getDimension(attr,
1372             UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE);
1373         break;
1374
1375         case
... com.android.internal.R.styleable.TextView_autoSizeMaxTextSize:
1376         autoSizeMaxTextSizeInPx = a.getDimension(attr,
1377             UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE);
1378         break;
1379
1380         case
... com.android.internal.R.styleable.TextView_autoSizePresetSizes:
1381         final int autoSizeStepSizeArrayResId =
... a.getResourceId(attr, 0);
1382         if (autoSizeStepSizeArrayResId > 0) {
1383             final TypedArray autoSizePresetTextSizes =
... a.getResources()
1384             .obtainTypedArray(autoSizeStepSizeArrayResId);
1385         setupAutoSizeUniformPresetSizes(autoSizePresetTextSizes);
1386             autoSizePresetTextSizes.recycle();
1387         }
1388         break;
1389         case
... com.android.internal.R.styleable.TextView_justificationMode:
1390         mJustificationMode = a.getInt(attr,
... Layout.JUSTIFICATION_MODE_NONE);
1391         break;
1392     }
1393 }
```

```
1394
1395     a.recycle();
1396
1397     BufferType bufferType = BufferType.EDITABLE;
1398
1399     final int variation =
1400         inputType & (EditorInfo.TYPE_MASK_CLASS |
1401 ... EditorInfo.TYPE_MASK_VARIATION);
1402     final boolean passwordInputType = variation
1403         == (EditorInfo.TYPE_CLASS_TEXT |
1404 ... EditorInfo.TYPE_TEXT_VARIATION_PASSWORD);
1405     final boolean webPasswordInputType = variation
1406         == (EditorInfo.TYPE_CLASS_TEXT |
1407 ... EditorInfo.TYPE_TEXT_VARIATION_WEB_PASSWORD);
1408     final boolean numberPasswordInputType = variation
1409         == (EditorInfo.TYPE_CLASS_NUMBER |
1410 ... EditorInfo.TYPE_NUMBER_VARIATION_PASSWORD);
1411
1412     mUseInternationalizedInput =
1413         context.getApplicationInfo().targetSdkVersion >=
1414 ... VERSION_CODES.0;
1415
1416     if (inputMethod != null) {
1417         Class<?> c;
1418
1419         try {
1420             c = Class.forName(inputMethod.toString());
1421         } catch (ClassNotFoundException ex) {
1422             throw new RuntimeException(ex);
1423         }
1424
1425         try {
1426             createEditorIfNeeded();
1427             mEditor.mKeyListener = (KeyListener) c.newInstance();
1428         } catch (InstantiationException ex) {
1429             throw new RuntimeException(ex);
1430         } catch (IllegalAccessException ex) {
1431             throw new RuntimeException(ex);
1432         }
1433         try {
1434             mEditor.mInputType = inputType != EditorInfo.TYPE_NULL
1435                 ? inputType
1436                 : mEditor.mKeyListener.getInputType();
1437         } catch (IncompatibleClassChangeError e) {
1438             mEditor.mInputType = EditorInfo.TYPE_CLASS_TEXT;
1439         }
1440     } else if (digits != null) {
1441         createEditorIfNeeded();
1442         mEditor.mKeyListener =
1443 ... DigitsKeyListener.getInstance(digits.toString());
```

```
1438 // If no input type was specified, we will default to
... generic
1439 // text, since we can't tell the IME about the set of digits
1440 // that was selected.
1441 mEditor.mInputType = inputType != EditorInfo.TYPE_NULL
1442     ? inputType : EditorInfo.TYPE_CLASS_TEXT;
1443 } else if (inputType != EditorInfo.TYPE_NULL) {
1444     setInputType(inputType, true);
1445     // If set, the input type overrides what was set using the
... deprecated singleLine flag.
1446     singleLine = !isMultilineInputType(inputType);
1447 } else if (phone) {
1448     createEditorIfNeeded();
1449     mEditor.mKeyListener = DialerKeyListener.getInstance();
1450     mEditor.mInputType = inputType =
... EditorInfo.TYPE_CLASS_PHONE;
1451 } else if (numeric != 0) {
1452     createEditorIfNeeded();
1453     mEditor.mKeyListener = DigitsKeyListener.getInstance(
1454         null, // locale
1455         (numeric & SIGNED) != 0,
1456         (numeric & DECIMAL) != 0);
1457     inputType = mEditor.mKeyListener.getInputType();
1458     mEditor.mInputType = inputType;
1459 } else if (autotext || autocap != -1) {
1460     TextKeyListener.Capitalize cap;
1461
1462     inputType = EditorInfo.TYPE_CLASS_TEXT;
1463
1464     switch (autocap) {
1465         case 1:
1466             cap = TextKeyListener.Capitalize.SENTENCES;
1467             inputType |=
... EditorInfo.TYPE_TEXT_FLAG_CAP_SENTENCES;
1468             break;
1469
1470         case 2:
1471             cap = TextKeyListener.Capitalize.WORDS;
1472             inputType |= EditorInfo.TYPE_TEXT_FLAG_CAP_WORDS;
1473             break;
1474
1475         case 3:
1476             cap = TextKeyListener.Capitalize.CHARACTERS;
1477             inputType |=
... EditorInfo.TYPE_TEXT_FLAG_CAP_CHARACTERS;
1478             break;
1479
1480         default:
1481             cap = TextKeyListener.Capitalize.NONE;
1482             break;
```

```
1483     }
1484
1485         createEditorIfNeeded();
1486         mEditor.mKeyListener = TextKeyListener.getInstance(autotext,
... cap);
1487         mEditor.mInputType = inputType;
1488     } else if (editable) {
1489         createEditorIfNeeded();
1490         mEditor.mKeyListener = TextKeyListener.getInstance();
1491         mEditor.mInputType = EditorInfo.TYPE_CLASS_TEXT;
1492     } else if (isTextSelectable()) {
1493         // Prevent text changes from keyboard.
1494         if (mEditor != null) {
1495             mEditor.mKeyListener = null;
1496             mEditor.mInputType = EditorInfo.TYPE_NULL;
1497         }
1498         bufferType = BufferType.SPANNABLE;
1499         // So that selection can be changed using arrow keys and
... touch is handled.
1500         setMovementMethod(ArrowKeyMovementMethod.getInstance());
1501     } else {
1502         if (mEditor != null) mEditor.mKeyListener = null;
1503
1504         switch (buffertype) {
1505             case 0:
1506                 bufferType = BufferType.NORMAL;
1507                 break;
1508             case 1:
1509                 bufferType = BufferType.SPANNABLE;
1510                 break;
1511             case 2:
1512                 bufferType = BufferType.EDITABLE;
1513                 break;
1514         }
1515     }
1516
1517     if (mEditor != null) {
1518         mEditor.adjustInputType(password, passwordInputType,
... webPasswordInputType,
1519             numberPasswordInputType);
1520     }
1521
1522     if (selectallonfocus) {
1523         createEditorIfNeeded();
1524         mEditor.mSelectAllOnFocus = true;
1525
1526         if (bufferType == BufferType.NORMAL) {
1527             bufferType = BufferType.SPANNABLE;
1528         }
1529     }
```

```
1530
1531     // Set up the tint (if needed) before setting the drawables so
... that it
1532     // gets applied correctly.
1533     if (drawableTint != null || drawableTintMode != null) {
1534         if (mDrawables == null) {
1535             mDrawables = new Drawables(context);
1536         }
1537         if (drawableTint != null) {
1538             mDrawables.mTintList = drawableTint;
1539             mDrawables.mHasTint = true;
1540         }
1541         if (drawableTintMode != null) {
1542             mDrawables.mTintMode = drawableTintMode;
1543             mDrawables.mHasTintMode = true;
1544         }
1545     }
1546
1547     // This call will save the initial left/right drawables
1548     setCompoundDrawablesWithIntrinsicBounds(
1549         drawableLeft, drawableTop, drawableRight,
... drawableBottom);
1550     setRelativeDrawablesIfNeeded(drawableStart, drawableEnd);
1551     setCompoundDrawablePadding(drawablePadding);
1552
1553     // Same as setSingleLine(), but make sure the transformation
... method and the maximum number
1554     // of lines of height are unchanged for multi-line TextViews.
1555     setInputTypeSingleLine(singleLine);
1556     applySingleLine(singleLine, singleLine, singleLine);
1557
1558     if (singleLine && getKeyListener() == null && ellipsize < 0) {
1559         ellipsize = 3; // END
1560     }
1561
1562     switch (ellipsize) {
1563         case 1:
1564             setEllipsize(TextUtils.TruncateAt.START);
1565             break;
1566         case 2:
1567             setEllipsize(TextUtils.TruncateAt.MIDDLE);
1568             break;
1569         case 3:
1570             setEllipsize(TextUtils.TruncateAt.END);
1571             break;
1572         case 4:
1573             if
... (ViewConfiguration.get(context).isFadingMarqueeEnabled()) {
1574                 setHorizontalFadingEdgeEnabled(true);
1575                 mMarqueeFadeMode = MARQUEE_FADE_NORMAL;
```

```
1576     } else {
1577         setHorizontalFadingEdgeEnabled(false);
1578         mMarqueeFadeMode =
... MARQUEE_FADE_SWITCH_SHOW_ELLIPSIS;
1579     }
1580     setEllipsize(TextUtils.TruncateAt.MARQUEE);
1581     break;
1582 }
1583
1584     setTextColor(textColor != null ? textColor :
... ColorStateList.valueOf(0xFF000000));
1585     setHintTextColor(textColorHint);
1586     setLinkTextColor(textColorLink);
1587     if (textColorHighlight != 0) {
1588         setHighlightColor(textColorHighlight);
1589     }
1590     setRawTextSize(textSize, true /* shouldRequestLayout */);
1591     setElegantTextHeight(elegant);
1592     setLetterSpacing(letterSpacing);
1593     setFontFeatureSettings(fontFeatureSettings);
1594
1595     if (allCaps) {
1596         setTransformationMethod(new
... AllCapsTransformationMethod(getContext()));
1597     }
1598
1599     if (password || passwordInputType || webPasswordInputType ||
... numberPasswordInputType) {
1600
... setTransformationMethod(PasswordTransformationMethod.getInstance());
1601         typefaceIndex = MONOSPACE;
1602     } else if (mEditor != null
1603         && (mEditor.mInputType
1604             & (EditorInfo.TYPE_MASK_CLASS |
... EditorInfo.TYPE_MASK_VARIATION))
1605         == (EditorInfo.TYPE_CLASS_TEXT |
... EditorInfo.TYPE_TEXT_VARIATION_PASSWORD)) {
1606         typefaceIndex = MONOSPACE;
1607     }
1608
1609     if (typefaceIndex != -1 && !fontFamilyExplicit) {
1610         fontFamily = null;
1611     }
1612     setTypefaceFromAttrs(fontTypeface, fontFamily, typefaceIndex,
... styleIndex);
1613
1614     if (shadowcolor != 0) {
1615         setShadowLayer(r, dx, dy, shadowcolor);
1616     }
1617
```

```
1618         if (maxLength >= 0) {
1619             setFilters(new InputFilter[] { new
... InputFilter.LengthFilter(maxLength) });
1620         } else {
1621             setFilters(NO_FILTERS);
1622         }
1623
1624         setText(text, bufferType);
1625         if (fromResourceId) {
1626             mTextFromResource = true;
1627         }
1628
1629         if (hint != null) setHint(hint);
1630
1631         /*
1632          * Views are not normally clickable unless specified to be.
1633          * However, TextViews that have input or movement methods *are*
1634          * clickable by default. By setting clickable here, we
... implicitly set focusable as well
1635          * if not overridden by the developer.
1636          */
1637         a = context.obtainStyledAttributes(
1638             attrs, com.android.internal.R.styleable.View,
... defStyleAttr, defStyleRes);
1639         boolean canInputOrMove = (mMovement != null || getKeyListener()
... != null);
1640         boolean clickable = canInputOrMove || isClickable();
1641         boolean longClickable = canInputOrMove || isLongClickable();
1642         int focusable = getFocusable();
1643
1644         n = a.getIndexCount();
1645         for (int i = 0; i < n; i++) {
1646             int attr = a.getIndex(i);
1647
1648             switch (attr) {
1649                 case com.android.internal.R.styleable.View_focusable:
1650                     TypedValue val = new TypedValue();
1651                     if (a.getValue(attr, val)) {
1652                         focusable = (val.type ==
... TypedValue.TYPE_INT_BOOLEAN)
1653                             ? (val.data == 0 ? NOT_FOCUSABLE :
... FOCUSABLE)
1654                             : val.data;
1655                     }
1656                     break;
1657
1658                 case com.android.internal.R.styleable.View_clickable:
1659                     clickable = a.getBoolean(attr, clickable);
1660                     break;
1661
```



```
1662     com.android.internal.R.styleable.View_longClickable:
1663         longClickable = a.getBoolean(attr, longClickable);
1664         break;
1665     }
1666 }
1667 a.recycle();
1668
1669     // Some apps were relying on the undefined behavior of focusable
1670 winning over
1671     // focusableInTouchMode != focusable in TextViews if both were
1672 specified in XML (usually
1673 // when starting with EditText and setting only
1674 focusable=false). To keep those apps from
1675 // breaking, re-apply the focusable attribute here.
1676 if (focusable != getFocusable()) {
1677     setFocusable(focusable);
1678 }
1679 setClickable(clickable);
1680 setLongClickable(longClickable);
1681
1682 if (mEditor != null) mEditor.prepareCursorControllers();
1683
1684 // If not explicitly specified this view is important for
1685 accessibility.
1686 if (getImportantForAccessibility() ==
1687 IMPORTANT_FOR_ACCESSIBILITY_AUTO) {
1688     setImportantForAccessibility(IMPORTANT_FOR_ACCESSIBILITY_YES);
1689 }
1690
1691 if (supportsAutoSizeText()) {
1692     if (mAutoSizeTextType == AUTO_SIZE_TEXT_TYPE_UNIFORM) {
1693         // If uniform auto-size has been specified but preset
1694 values have not been set then
1695         // replace the auto-size configuration values that have
1696 not been specified with the
1697 // defaults.
1698         if (!mHasPresetAutoSizeValues) {
1699             final DisplayMetrics displayMetrics =
1700 getResources().getDisplayMetrics();
1701
1702             if (autoSizeMinTextSizeInPx ==
1703 UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE) {
1704                 autoSizeMinTextSizeInPx =
1705 TypedValue.applyDimension(
1706                     TypedValue.COMPLEX_UNIT_SP,
1707                     DEFAULT_AUTO_SIZE_MIN_TEXT_SIZE_IN_SP,
1708                     displayMetrics);
1709             }
1710         }
1711     }
1712 }
```

```

1700
1701         if (autoSizeMaxTextSizeInPx ==
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE) {
1702             autoSizeMaxTextSizeInPx =
... TypedValue.applyDimension(
1703                 TypedValue.COMPLEX_UNIT_SP,
1704                 DEFAULT_AUTO_SIZE_MAX_TEXT_SIZE_IN_SP,
1705                 displayMetrics);
1706         }
1707
1708         if (autoSizeStepGranularityInPx
1709             ==
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE) {
1710             autoSizeStepGranularityInPx =
... DEFAULT_AUTO_SIZE_GRANULARITY_IN_PX;
1711         }
1712
1713
... validateAndSetAutoSizeTextTypeUniformConfiguration(
... autoSizeMinTextSizeInPx,
1714             autoSizeMaxTextSizeInPx,
1715             autoSizeStepGranularityInPx);
1716     }
1717
1718     setupAutoSizeText();
1719 }
1720 } else {
1721     mAutoSizeTextType = AUTO_SIZE_TEXT_TYPE_NONE;
1722 }
1723 }
1724
1725 /**
1726  * Specify whether this widget should automatically scale the text
... to try to perfectly fit
1727  * within the layout bounds by using the default auto-size
... configuration.
1728  *
1729  * @param autoSizeTextType the type of auto-size. Must be one of
1730  *     {@link TextView#AUTO_SIZE_TEXT_TYPE_NONE} or
1731  *     {@link TextView#AUTO_SIZE_TEXT_TYPE_UNIFORM}
1732  *
1733  * @throws IllegalArgumentException if <code>autoSizeTextType</code>
... is none of the types above.
1734  *
1735  * @attr ref android.R.styleable#TextView_autoSizeTextType
1736  *
1737  * @see #getAutoSizeTextType()
1738  */
1739 public void setAutoSizeTextTypeWithDefaults(@AutoSizeTextType int
... autoSizeTextType) {

```

```
1740     if (supportsAutoSizeText()) {
1741         switch (autoSizeTextType) {
1742             case AUTO_SIZE_TEXT_TYPE_NONE:
1743                 clearAutoSizeConfiguration();
1744                 break;
1745             case AUTO_SIZE_TEXT_TYPE_UNIFORM:
1746                 final DisplayMetrics displayMetrics =
... getResources().getDisplayMetrics();
1747                 final float autoSizeMinTextSizeInPx =
... TypedValue.applyDimension(
1748                     TypedValue.COMPLEX_UNIT_SP,
1749                     DEFAULT_AUTO_SIZE_MIN_TEXT_SIZE_IN_SP,
1750                     displayMetrics);
1751                 final float autoSizeMaxTextSizeInPx =
... TypedValue.applyDimension(
1752                     TypedValue.COMPLEX_UNIT_SP,
1753                     DEFAULT_AUTO_SIZE_MAX_TEXT_SIZE_IN_SP,
1754                     displayMetrics);
1755
1756                 validateAndSetAutoSizeTextTypeUniformConfiguration(
1757                     autoSizeMinTextSizeInPx,
1758                     autoSizeMaxTextSizeInPx,
1759                     DEFAULT_AUTO_SIZE_GRANULARITY_IN_PX);
1760                 if (setupAutoSizeText()) {
1761                     autoSizeText();
1762                     invalidate();
1763                 }
1764                 break;
1765             default:
1766                 throw new IllegalArgumentException(
1767                     "Unknown auto-size text type: " +
... autoSizeTextType);
1768         }
1769     }
1770 }
1771
1772 /**
1773  * Specify whether this widget should automatically scale the text
... to try to perfectly fit
1774  * within the layout bounds. If all the configuration params are
... valid the type of auto-size is
1775  * set to {@link #AUTO_SIZE_TEXT_TYPE_UNIFORM}.
1776  *
1777  * @param autoSizeMinTextSize the minimum text size available for
... auto-size
1778  * @param autoSizeMaxTextSize the maximum text size available for
... auto-size
1779  * @param autoSizeStepGranularity the auto-size step granularity. It
... is used in conjunction with
1780  *
... the minimum and maximum text size
```

```

1780... in order to build the set of
1781     *                               text sizes the system uses to
... choose from when auto-sizing
1782     * @param unit the desired dimension unit for all sizes above. See
... {@link TypedValue} for the
1783     *           possible dimension units
1784     *
1785     * @throws IllegalArgumentException if any of the configuration
... params are invalid.
1786     *
1787     * @attr ref android.R.styleable#TextView_autoSizeTextType
1788     * @attr ref android.R.styleable#TextView_autoSizeMinTextSize
1789     * @attr ref android.R.styleable#TextView_autoSizeMaxTextSize
1790     * @attr ref android.R.styleable#TextView_autoSizeStepGranularity
1791     *
1792     * @see #setAutoSizeTextTypeWithDefaults(int)
1793     * @see #setAutoSizeTextTypeUniformWithPresetSizes(int[], int)
1794     * @see #getAutoSizeMinTextSize()
1795     * @see #getAutoSizeMaxTextSize()
1796     * @see #getAutoSizeStepGranularity()
1797     * @see #getAutoSizeTextAvailableSizes()
1798     */
1799     public void setAutoSizeTextTypeUniformWithConfiguration(int
... autoSizeMinTextSize,
1800         int autoSizeMaxTextSize, int autoSizeStepGranularity, int
... unit) {
1801         if (supportsAutoSizeText()) {
1802             final DisplayMetrics displayMetrics =
... getResources().getDisplayMetrics();
1803             final float autoSizeMinTextSizeInPx =
... TypedValue.applyDimension(
1804                 unit, autoSizeMinTextSize, displayMetrics);
1805             final float autoSizeMaxTextSizeInPx =
... TypedValue.applyDimension(
1806                 unit, autoSizeMaxTextSize, displayMetrics);
1807             final float autoSizeStepGranularityInPx =
... TypedValue.applyDimension(
1808                 unit, autoSizeStepGranularity, displayMetrics);
1809
1810             validateAndSetAutoSizeTextTypeUniformConfiguration(
... autoSizeMinTextSizeInPx,
1811                 autoSizeMaxTextSizeInPx,
1812                 autoSizeStepGranularityInPx);
1813
1814             if (setupAutoSizeText()) {
1815                 autoSizeText();
1816                 invalidate();
1817             }
1818         }

```

```
1819 }
1820
1821 /**
1822  * Specify whether this widget should automatically scale the text
... to try to perfectly fit
1823  * within the layout bounds. If at least one value from the
... <code>presetSizes</code> is valid
1824  * then the type of auto-size is set to {@link
... #AUTO_SIZE_TEXT_TYPE_UNIFORM}.
1825  *
1826  * @param presetSizes an {@code int} array of sizes in pixels
1827  * @param unit the desired dimension unit for the preset sizes
... above. See {@link TypedValue} for
1828  *         the possible dimension units
1829  *
1830  * @throws IllegalArgumentException if all of the
... <code>presetSizes</code> are invalid.
1831  *
1832  * @attr ref android.R.styleable#TextView_autoSizeTextType
1833  * @attr ref android.R.styleable#TextView_autoSizePresetSizes
1834  *
1835  * @see #setAutoSizeTextTypeWithDefaults(int)
1836  * @see #setAutoSizeTextTypeUniformWithConfiguration(int, int, int,
... int)
1837  * @see #getAutoSizeMinTextSize()
1838  * @see #getAutoSizeMaxTextSize()
1839  * @see #getAutoSizeTextAvailableSizes()
1840  */
1841 public void setAutoSizeTextTypeUniformWithPresetSizes(@NonNull int[]
... presetSizes, int unit) {
1842     if (supportsAutoSizeText()) {
1843         final int presetSizesLength = presetSizes.length;
1844         if (presetSizesLength > 0) {
1845             int[] presetSizesInPx = new int[presetSizesLength];
1846
1847             if (unit == TypedValue.COMPLEX_UNIT_PX) {
1848                 presetSizesInPx = Arrays.copyOf(presetSizes,
... presetSizesLength);
1849             } else {
1850                 final DisplayMetrics displayMetrics =
... getResources().getDisplayMetrics();
1851                 // Convert all to sizes to pixels.
1852                 for (int i = 0; i < presetSizesLength; i++) {
1853                     presetSizesInPx[i] =
... Math.round(TypedValue.applyDimension(unit,
1854                                     presetSizes[i], displayMetrics));
1855                 }
1856             }
1857
1858             mAutoSizeTextSizesInPx =
```

```
1858... cleanupAutoSizePresetSizes(presetSizesInPx);
1859         if (!setupAutoSizeUniformPresetSizesConfiguration()) {
1860             throw new IllegalArgumentException("None of the
... preset sizes is valid: "
1861                 + Arrays.toString(presetSizes));
1862         }
1863     } else {
1864         mHasPresetAutoSizeValues = false;
1865     }
1866
1867     if (setupAutoSizeText()) {
1868         autoSizeText();
1869         invalidate();
1870     }
1871 }
1872 }
1873
1874 /**
1875  * Returns the type of auto-size set for this widget.
1876  *
1877  * @return an {@code int} corresponding to one of the auto-size
... types:
1878  *     {@link TextView#AUTO_SIZE_TEXT_TYPE_NONE} or
1879  *     {@link TextView#AUTO_SIZE_TEXT_TYPE_UNIFORM}
1880  *
1881  * @attr ref android.R.styleable#TextView_autoSizeTextType
1882  *
1883  * @see #setAutoSizeTextTypeWithDefaults(int)
1884  * @see #setAutoSizeTextTypeUniformWithConfiguration(int, int, int,
... int)
1885  * @see #setAutoSizeTextTypeUniformWithPresetSizes(int[], int)
1886  */
1887 @AutoSizeTextType
1888 public int getAutoSizeTextType() {
1889     return mAutoSizeTextType;
1890 }
1891
1892 /**
1893  * @return the current auto-size step granularity in pixels.
1894  *
1895  * @attr ref android.R.styleable#TextView_autoSizeStepGranularity
1896  *
1897  * @see #setAutoSizeTextTypeUniformWithConfiguration(int, int, int,
... int)
1898  */
1899 public int getAutoSizeStepGranularity() {
1900     return Math.round(mAutoSizeStepGranularityInPx);
1901 }
1902
1903 /**
```

```
1904 * @return the current auto-size minimum text size in pixels (the
... default is 12sp). Note that
1905 * if auto-size has not been configured this function
... returns {@code -1}.
1906 *
1907 * @attr ref android.R.styleable#TextView_autoSizeMinTextSize
1908 *
1909 * @see #setAutoSizeTextTypeUniformWithConfiguration(int, int, int,
... int)
1910 * @see #setAutoSizeTextTypeUniformWithPresetSizes(int[], int)
1911 */
1912 public int getAutoSizeMinTextSize() {
1913     return Math.round(mAutoSizeMinTextSizeInPx);
1914 }
1915
1916 /**
1917 * @return the current auto-size maximum text size in pixels (the
... default is 112sp). Note that
1918 * if auto-size has not been configured this function
... returns {@code -1}.
1919 *
1920 * @attr ref android.R.styleable#TextView_autoSizeMaxTextSize
1921 *
1922 * @see #setAutoSizeTextTypeUniformWithConfiguration(int, int, int,
... int)
1923 * @see #setAutoSizeTextTypeUniformWithPresetSizes(int[], int)
1924 */
1925 public int getAutoSizeMaxTextSize() {
1926     return Math.round(mAutoSizeMaxTextSizeInPx);
1927 }
1928
1929 /**
1930 * @return the current auto-size {@code int} sizes array (in
... pixels).
1931 *
1932 * @see #setAutoSizeTextTypeUniformWithConfiguration(int, int, int,
... int)
1933 * @see #setAutoSizeTextTypeUniformWithPresetSizes(int[], int)
1934 */
1935 public int[] getAutoSizeTextAvailableSizes() {
1936     return mAutoSizeTextSizesInPx;
1937 }
1938
1939 private void setupAutoSizeUniformPresetSizes(TypedArray textSizes) {
1940     final int textSizesLength = textSizes.length();
1941     final int[] parsedSizes = new int[textSizesLength];
1942
1943     if (textSizesLength > 0) {
1944         for (int i = 0; i < textSizesLength; i++) {
1945             parsedSizes[i] = textSizes.getDimensionPixelSize(i, -1);
```



```
1946     }
1947     mAutoSizeTextSizesInPx =
... cleanupAutoSizePresetSizes(parsedSizes);
1948     setupAutoSizeUniformPresetSizesConfiguration();
1949     }
1950 }
1951
1952 private boolean setupAutoSizeUniformPresetSizesConfiguration() {
1953     final int sizesLength = mAutoSizeTextSizesInPx.length;
1954     mHasPresetAutoSizeValues = sizesLength > 0;
1955     if (mHasPresetAutoSizeValues) {
1956         mAutoSizeTextType = AUTO_SIZE_TEXT_TYPE_UNIFORM;
1957         mAutoSizeMinTextSizeInPx = mAutoSizeTextSizesInPx[0];
1958         mAutoSizeMaxTextSizeInPx =
... mAutoSizeTextSizesInPx[sizesLength - 1];
1959         mAutoSizeStepGranularityInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
1960     }
1961     return mHasPresetAutoSizeValues;
1962 }
1963
1964 /**
1965  * If all params are valid then save the auto-size configuration.
1966  *
1967  * @throws IllegalArgumentException if any of the params are invalid
1968  */
1969 private void
... validateAndSetAutoSizeTextTypeUniformConfiguration(float
... autoSizeMinTextSizeInPx,
1970     float autoSizeMaxTextSizeInPx, float
... autoSizeStepGranularityInPx) {
1971     // First validate.
1972     if (autoSizeMinTextSizeInPx <= 0) {
1973         throw new IllegalArgumentException("Minimum auto-size text
... size ("
1974             + autoSizeMinTextSizeInPx + "px) is less or equal to
... (0px)");
1975     }
1976
1977     if (autoSizeMaxTextSizeInPx <= autoSizeMinTextSizeInPx) {
1978         throw new IllegalArgumentException("Maximum auto-size text
... size ("
1979             + autoSizeMaxTextSizeInPx + "px) is less or equal to
... minimum auto-size "
1980             + "text size (" + autoSizeMinTextSizeInPx + "px)");
1981     }
1982
1983     if (autoSizeStepGranularityInPx <= 0) {
1984         throw new IllegalArgumentException("The auto-size step
... granularity ("
```

```
1985     + autoSizeStepGranularityInPx + "px) is less or equal to
...     (0px)");
1986     }
1987
1988     // All good, persist the configuration.
1989     mAutoSizeTextType = AUTO_SIZE_TEXT_TYPE_UNIFORM;
1990     mAutoSizeMinTextSizeInPx = autoSizeMinTextSizeInPx;
1991     mAutoSizeMaxTextSizeInPx = autoSizeMaxTextSizeInPx;
1992     mAutoSizeStepGranularityInPx = autoSizeStepGranularityInPx;
1993     mHasPresetAutoSizeValues = false;
1994 }
1995
1996 private void clearAutoSizeConfiguration() {
1997     mAutoSizeTextType = AUTO_SIZE_TEXT_TYPE_NONE;
1998     mAutoSizeMinTextSizeInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
1999     mAutoSizeMaxTextSizeInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
2000     mAutoSizeStepGranularityInPx =
... UNSET_AUTO_SIZE_UNIFORM_CONFIGURATION_VALUE;
2001     mAutoSizeTextSizesInPx = EmptyArray.INT;
2002     mNeedsAutoSizeText = false;
2003 }
2004
2005 // Returns distinct sorted positive values.
2006 private int[] cleanupAutoSizePresetSizes(int[] presetValues) {
2007     final int presetValuesLength = presetValues.length;
2008     if (presetValuesLength == 0) {
2009         return presetValues;
2010     }
2011     Arrays.sort(presetValues);
2012
2013     final IntArray uniqueValidSizes = new IntArray();
2014     for (int i = 0; i < presetValuesLength; i++) {
2015         final int currentPresetValue = presetValues[i];
2016
2017         if (currentPresetValue > 0
2018             && uniqueValidSizes.binarySearch(currentPresetValue)
... < 0) {
2019             uniqueValidSizes.add(currentPresetValue);
2020         }
2021     }
2022
2023     return presetValuesLength == uniqueValidSizes.size()
2024         ? presetValues
2025         : uniqueValidSizes.toArray();
2026 }
2027
2028 private boolean setupAutoSizeText() {
2029     if (supportsAutoSizeText() && mAutoSizeTextType ==
```

```
2029... AUTO_SIZE_TEXT_TYPE_UNIFORM) {
2030     // Calculate the sizes set based on minimum size, maximum
... size and step size if we do
2031     // not have a predefined set of sizes or if the current
... sizes array is empty.
2032     if (!mHasPresetAutoSizeValues ||
... mAutoSizeTextSizesInPx.length == 0) {
2033         int autoSizeValuesLength = 1;
2034         float currentSize =
... Math.round(mAutoSizeMinTextSizeInPx);
2035         while (Math.round(currentSize +
... mAutoSizeStepGranularityInPx)
2036             <= Math.round(mAutoSizeMaxTextSizeInPx)) {
2037             autoSizeValuesLength++;
2038             currentSize += mAutoSizeStepGranularityInPx;
2039         }
2040
2041         int[] autoSizeTextSizesInPx = new
... int[autoSizeValuesLength];
2042         float sizeToAdd = mAutoSizeMinTextSizeInPx;
2043         for (int i = 0; i < autoSizeValuesLength; i++) {
2044             autoSizeTextSizesInPx[i] = Math.round(sizeToAdd);
2045             sizeToAdd += mAutoSizeStepGranularityInPx;
2046         }
2047         mAutoSizeTextSizesInPx =
... cleanupAutoSizePresetSizes(autoSizeTextSizesInPx);
2048     }
2049
2050     mNeedsAutoSizeText = true;
2051 } else {
2052     mNeedsAutoSizeText = false;
2053 }
2054
2055 return mNeedsAutoSizeText;
2056 }
2057
2058 private int[] parseDimensionArray(TypedArray dimens) {
2059     if (dimens == null) {
2060         return null;
2061     }
2062     int[] result = new int[dimens.length()];
2063     for (int i = 0; i < result.length; i++) {
2064         result[i] = dimens.getDimensionPixelSize(i, 0);
2065     }
2066     return result;
2067 }
2068
2069 /**
2070  * @hide
2071  */
```

```
2072 @Override
2073     public void onActivityResult(int requestCode, int resultCode, Intent
... data) {
2074         if (requestCode == PROCESS_TEXT_REQUEST_CODE) {
2075             if (resultCode == Activity.RESULT_OK && data != null) {
2076                 CharSequence result =
... data.getCharSequenceExtra(Intent.EXTRA_PROCESS_TEXT);
2077                 if (result != null) {
2078                     if (isTextEditable()) {
2079                         replaceSelectionWithText(result);
2080                         if (mEditor != null) {
2081                             mEditor.refreshTextActionMode();
2082                         }
2083                     } else {
2084                         if (result.length() > 0) {
2085                             Toast.makeText(getContext(),
... String.valueOf(result), Toast.LENGTH_LONG)
2086                                 .show();
2087                         }
2088                     }
2089                 }
2090             } else if (mText instanceof Spannable) {
2091                 // Reset the selection.
2092                 Selection.setSelection((Spannable) mText,
... getSelectionEnd());
2093             }
2094         }
2095     }
2096
2097     private void setTypefaceFromAttrs(Typeface fontTypeface, String
... familyName, int typefaceIndex,
2098         int styleIndex) {
2099         Typeface tf = fontTypeface;
2100         if (tf == null && familyName != null) {
2101             tf = Typeface.create(familyName, styleIndex);
2102         } else if (tf != null && tf.getStyle() != styleIndex) {
2103             tf = Typeface.create(tf, styleIndex);
2104         }
2105         if (tf != null) {
2106             setTypeface(tf);
2107             return;
2108         }
2109         switch (typefaceIndex) {
2110             case SANS:
2111                 tf = Typeface.SANS_SERIF;
2112                 break;
2113
2114             case SERIF:
2115                 tf = Typeface.SERIF;
2116                 break;
```

```
2117
2118         case MONOSPACE:
2119             tf = Typeface.MONOSPACE;
2120             break;
2121     }
2122
2123     set Typeface(tf, styleIndex);
2124 }
2125
2126     private void setRelativeDrawablesIfNeeded(Drawable start, Drawable
... end) {
2127         boolean hasRelativeDrawables = (start != null) || (end != null);
2128         if (hasRelativeDrawables) {
2129             Drawables dr = mDrawables;
2130             if (dr == null) {
2131                 mDrawables = dr = new Drawables(getContext());
2132             }
2133             mDrawables.mOverride = true;
2134             final Rect compoundRect = dr.mCompoundRect;
2135             int[] state = getDrawableState();
2136             if (start != null) {
2137                 start.setBounds(0, 0, start.getIntrinsicWidth(),
... start.getIntrinsicHeight());
2138                 start.setState(state);
2139                 start.copyBounds(compoundRect);
2140                 start.setCallback(this);
2141
2142                 dr.mDrawableStart = start;
2143                 dr.mDrawableSizeStart = compoundRect.width();
2144                 dr.mDrawableHeightStart = compoundRect.height();
2145             } else {
2146                 dr.mDrawableSizeStart = dr.mDrawableHeightStart = 0;
2147             }
2148             if (end != null) {
2149                 end.setBounds(0, 0, end.getIntrinsicWidth(),
... end.getIntrinsicHeight());
2150                 end.setState(state);
2151                 end.copyBounds(compoundRect);
2152                 end.setCallback(this);
2153
2154                 dr.mDrawableEnd = end;
2155                 dr.mDrawableSizeEnd = compoundRect.width();
2156                 dr.mDrawableHeightEnd = compoundRect.height();
2157             } else {
2158                 dr.mDrawableSizeEnd = dr.mDrawableHeightEnd = 0;
2159             }
2160             resetResolvedDrawables();
2161             resolveDrawables();
2162             applyCompoundDrawableTint();
2163     }
```



```

2212     } else {
2213         tf = Typeface.create(tf, style);
2214     }
2215
2216     setTypeface(tf);
2217     // now compute what (if any) algorithmic styling is needed
2218     int typefaceStyle = tf != null ? tf.getStyle() : 0;
2219     int need = style & ~typefaceStyle;
2220     mTextPaint.setFakeBoldText((need & Typeface.BOLD) != 0);
2221     mTextPaint.setTextSkewX((need & Typeface.ITALIC) != 0 ?
... -0.25f : 0);
2222     } else {
2223         mTextPaint.setFakeBoldText(false);
2224         mTextPaint.setTextSkewX(0);
2225         setTypeface(tf);
2226     }
2227 }
2228
2229 /**
2230  * Subclasses override this to specify that they have a KeyListener
2231  * by default even if not specifically called for in the XML
... options.
2232  */
2233 protected boolean getDefaultEditable() {
2234     return false;
2235 }
2236
2237 /**
2238  * Subclasses override this to specify a default movement method.
2239  */
2240 protected MovementMethod getDefaultMovementMethod() {
2241     return null;
2242 }
2243
2244 /**
2245  * Return the text that TextView is displaying. If {@link
... #setText(CharSequence)} was called
2246  * with an argument of {@link
... android.widget.TextView.BufferType#SPANNABLE BufferType.SPANNABLE}
2247  * or {@link android.widget.TextView.BufferType#EDITABLE
... BufferType.EDITABLE}, you can cast
2248  * the return value from this method to Spannable or Editable,
... respectively.
2249  *
2250  * <p>The content of the return value should not be modified. If you
... want a modifiable one, you
2251  * should make your own copy first.</p>
2252  *
2253  * @return The text displayed by the text view.
2254  * @attr ref android.R.styleable#TextView_text

```



```
2255 */
2256 @ViewDebug.CapturedViewProperty
2257 public CharSequence getText() {
2258     return mText;
2259 }
2260
2261 /**
2262  * Returns the length, in characters, of the text managed by this
... TextView
2263  * @return The length of the text managed by the TextView in
... characters.
2264  */
2265 public int length() {
2266     return mText.length();
2267 }
2268
2269 /**
2270  * Return the text that TextView is displaying as an Editable
... object. If the text is not
2271  * editable, null is returned.
2272  *
2273  * @see #getText
2274  */
2275 public Editable getEditableText() {
2276     return (mText instanceof Editable) ? (Editable) mText : null;
2277 }
2278
2279 /**
2280  * Gets the vertical distance between lines of text, in pixels.
2281  * Note that markup within the text can cause individual lines
2282  * to be taller or shorter than this height, and the layout may
2283  * contain additional first-or last-line padding.
2284  * @return The height of one standard line in pixels.
2285  */
2286 public int getLineHeight() {
2287     return FastMath.round(mTextPaint.getFontMetricsInt(null) *
... mSpacingMult + mSpacingAdd);
2288 }
2289
2290 /**
2291  * Gets the {@link android.text.Layout} that is currently being used
... to display the text.
2292  * This value can be null if the text or width has recently changed.
2293  * @return The Layout that is currently being used to display the
... text.
2294  */
2295 public final Layout getLayout() {
2296     return mLayout;
2297 }
2298
```

```
2299  /**
2300     * @return the {@link android.text.Layout} that is currently being
... used to
2301     * display the hint text. This can be null.
2302     */
2303     final Layout getHintLayout() {
2304         return mHintLayout;
2305     }
2306
2307     /**
2308     * Retrieve the {@link android.content.UndoManager} that is
... currently associated
2309     * with this TextView. By default there is no associated
... UndoManager, so null
2310     * is returned. One can be associated with the TextView through
2311     * {@link #setUndoManager(android.content.UndoManager, String)}
2312     *
2313     * @hide
2314     */
2315     public final UndoManager getUndoManager() {
2316         // TODO: Consider supporting a global undo manager.
2317         throw new UnsupportedOperationException("not implemented");
2318     }
2319
2320
2321     /**
2322     * @hide
2323     */
2324     @VisibleForTesting
2325     public final Editor getEditorForTesting() {
2326         return mEditor;
2327     }
2328
2329     /**
2330     * Associate an {@link android.content.UndoManager} with this
... TextView. Once
2331     * done, all edit operations on the TextView will result in
... appropriate
2332     * {@link android.content.UndoOperation} objects pushed on the given
... UndoManager's
2333     * stack.
2334     *
2335     * @param undoManager The {@link android.content.UndoManager} to
... associate with
2336     * this TextView, or null to clear any existing association.
2337     * @param tag String tag identifying this particular TextView owner
... in the
2338     * UndoManager. This is used to keep the correct association with
... the
2339     * {@link android.content.UndoOwner} of any operations inside of the
```

```
2339... UndoManager.
2340     *
2341     * @hide
2342     */
2343     public final void setUndoManager(UndoManager undoManager, String
... tag) {
2344         // TODO: Consider supporting a global undo manager. An
... implementation will need to:
2345         // * createEditorIfNeeded()
2346         // * Promote to BufferType.EDITABLE if needed.
2347         // * Update the UndoManager and UndoOwner.
2348         // Likewise it will need to be able to restore the default
... UndoManager.
2349         throw new UnsupportedOperationException("not implemented");
2350     }
2351
2352     /**
2353     * Gets the current {@link KeyListener} for the TextView.
2354     * This will frequently be null for non-EditText TextViews.
2355     * @return the current key listener for this TextView.
2356     *
2357     * @attr ref android.R.styleable#TextView_numeric
2358     * @attr ref android.R.styleable#TextView_digits
2359     * @attr ref android.R.styleable#TextView_phoneNumber
2360     * @attr ref android.R.styleable#TextView_inputMethod
2361     * @attr ref android.R.styleable#TextView_capitalize
2362     * @attr ref android.R.styleable#TextView_autoText
2363     */
2364     public final KeyListener getKeyListener() {
2365         return mEditor == null ? null : mEditor.mKeyListener;
2366     }
2367
2368     /**
2369     * Sets the key listener to be used with this TextView. This can be
... null
2370     * to disallow user input. Note that this method has significant
... and
2371     * subtle interactions with soft keyboards and other input method:
2372     * see {@link KeyListener#getInputType()}
... KeyListener.getContentType()}
2373     * for important details. Calling this method will replace the
... current
2374     * content type of the text view with the content type returned by
... the
2375     * key listener.
2376     * <p>
2377     * Be warned that if you want a TextView with a key listener or
... movement
2378     * method not to be focusable, or if you want a TextView without a
2379     * key listener or movement method to be focusable, you must call
```

```
2380 * {@link #setFocusable} again after calling this to get the
... focusability
2381 * back the way you want it.
2382 *
2383 * @attr ref android.R.styleable#TextView_numeric
2384 * @attr ref android.R.styleable#TextView_digits
2385 * @attr ref android.R.styleable#TextView_phoneNumber
2386 * @attr ref android.R.styleable#TextView_inputMethod
2387 * @attr ref android.R.styleable#TextView_capitalize
2388 * @attr ref android.R.styleable#TextView_autoText
2389 */
2390 public void setKeyListener(KeyListener input) {
2391     mListenerChanged = true;
2392     setKeyListenerOnly(input);
2393     fixFocusableAndClickableSettings();
2394
2395     if (input != null) {
2396         createEditorIfNeeded();
2397         setInputTypeFromEditor();
2398     } else {
2399         if (mEditor != null) mEditor.mInputType =
... EditorInfo.TYPE_NULL;
2400     }
2401
2402     InputMethodManager imm = InputMethodManager.peekInstance();
2403     if (imm != null) imm.restartInput(this);
2404 }
2405
2406 private void setInputTypeFromEditor() {
2407     try {
2408         mEditor.mInputType = mEditor.mKeyListener.getInputType();
2409     } catch (IncompatibleClassChangeError e) {
2410         mEditor.mInputType = EditorInfo.TYPE_CLASS_TEXT;
2411     }
2412     // Change inputType, without affecting transformation.
2413     // No need to applySingleLine since mSingleLine is unchanged.
2414     setInputTypeSingleLine(mSingleLine);
2415 }
2416
2417 private void setKeyListenerOnly(KeyListener input) {
2418     if (mEditor == null && input == null) return; // null is the
... default value
2419
2420     createEditorIfNeeded();
2421     if (mEditor.mKeyListener != input) {
2422         mEditor.mKeyListener = input;
2423         if (input != null && !(mText instanceof Editable)) {
2424             setText(mText);
2425         }
2426
```

```
2427     setFilters((Editable) mText, mFilters);
2428     }
2429 }
2430
2431 /**
2432  * Gets the {@link android.text.method.MovementMethod} being used
... for this TextView,
2433  * which provides positioning, scrolling, and text selection
... functionality.
2434  * This will frequently be null for non-EditText TextViews.
2435  * @return the movement method being used for this TextView.
2436  * @see android.text.method.MovementMethod
2437  */
2438 public final MovementMethod getMovementMethod() {
2439     return mMovement;
2440 }
2441
2442 /**
2443  * Sets the {@link android.text.method.MovementMethod} for handling
... arrow key movement
2444  * for this TextView. This can be null to disallow using the arrow
... keys to move the
2445  * cursor or scroll the view.
2446  * <p>
2447  * Be warned that if you want a TextView with a key listener or
... movement
2448  * method not to be focusable, or if you want a TextView without a
2449  * key listener or movement method to be focusable, you must call
2450  * {@link #setFocusable} again after calling this to get the
... focusability
2451  * back the way you want it.
2452  */
2453 public final void setMovementMethod(MovementMethod movement) {
2454     if (mMovement != movement) {
2455         mMovement = movement;
2456
2457         if (movement != null && !(mText instanceof Spannable)) {
2458             setText(mText);
2459         }
2460
2461         fixFocusableAndClickableSettings();
2462
2463         // SelectionModifierCursorController depends on
... textCanBeSelected, which depends on
2464         // mMovement
2465         if (mEditor != null) mEditor.prepareCursorControllers();
2466     }
2467 }
2468
2469 private void fixFocusableAndClickableSettings() {
```

```
2470     if (mMovement != null || (mEditor != null &&
... mEditor.mKeyListener != null)) {
2471         setFocusable(FOCUSABLE);
2472         setClickable(true);
2473         setLongClickable(true);
2474     } else {
2475         setFocusable(FOCUSABLE_AUTO);
2476         setClickable(false);
2477         setLongClickable(false);
2478     }
2479 }
2480
2481 /**
2482  * Gets the current {@link android.text.method.TransformationMethod}
... for the TextView.
2483  * This is frequently null, except for single-line and password
... fields.
2484  * @return the current transformation method for this TextView.
2485  *
2486  * @attr ref android.R.styleable#TextView_password
2487  * @attr ref android.R.styleable#TextView_singleLine
2488  */
2489 public final TransformationMethod getTransformationMethod() {
2490     return mTransformation;
2491 }
2492
2493 /**
2494  * Sets the transformation that is applied to the text that this
2495  * TextView is displaying.
2496  *
2497  * @attr ref android.R.styleable#TextView_password
2498  * @attr ref android.R.styleable#TextView_singleLine
2499  */
2500 public final void setTransformationMethod(TransformationMethod
... method) {
2501     if (method == mTransformation) {
2502         // Avoid the setText() below if the transformation is
2503         // the same.
2504         return;
2505     }
2506     if (mTransformation != null) {
2507         if (mText instanceof Spannable) {
2508             ((Spannable) mText).removeSpan(mTransformation);
2509         }
2510     }
2511
2512     mTransformation = method;
2513
2514     if (method instanceof TransformationMethod2) {
2515         TransformationMethod2 method2 = (TransformationMethod2)
```

```
2515... method;
2516         mAllowTransformationLengthChange = !isTextSelectable() &&
... !(mText instanceof Editable);
2517
... method2.setLengthChangesAllowed(mAllowTransformationLengthChange);
2518     } else {
2519         mAllowTransformationLengthChange = false;
2520     }
2521
2522     setText(mText);
2523
2524     if (hasPasswordTransformationMethod()) {
2525         notifyViewAccessibilityStateChangedIfNeeded(
2526             AccessibilityEvent.CONTENT_CHANGE_TYPE_UNDEFINED);
2527     }
2528
2529     // PasswordTransformationMethod always have LTR text direction
... heuristics returned by
2530     // getTextDirectionHeuristic, needs reset
2531     mTextDir = getTextDirectionHeuristic();
2532 }
2533
2534 /**
2535  * Returns the top padding of the view, plus space for the top
2536  * Drawable if any.
2537  */
2538 public int getCompoundPaddingTop() {
2539     final Drawables dr = mDrawables;
2540     if (dr == null || dr.mShowing[Drawables.TOP] == null) {
2541         return mPaddingTop;
2542     } else {
2543         return mPaddingTop + dr.mDrawablePadding +
... dr.mDrawableSizeTop;
2544     }
2545 }
2546
2547 /**
2548  * Returns the bottom padding of the view, plus space for the bottom
2549  * Drawable if any.
2550  */
2551 public int getCompoundPaddingBottom() {
2552     final Drawables dr = mDrawables;
2553     if (dr == null || dr.mShowing[Drawables.BOTTOM] == null) {
2554         return mPaddingBottom;
2555     } else {
2556         return mPaddingBottom + dr.mDrawablePadding +
... dr.mDrawableSizeBottom;
2557     }
2558 }
2559
```



```
2560 /**
2561  * Returns the left padding of the view, plus space for the left
2562  * Drawable if any.
2563  */
2564 public int getCompoundPaddingLeft() {
2565     final Drawables dr = mDrawables;
2566     if (dr == null || dr.mShowing[Drawables.LEFT] == null) {
2567         return mPaddingLeft;
2568     } else {
2569         return mPaddingLeft + dr.mDrawablePadding +
... dr.mDrawableSizeLeft;
2570     }
2571 }
2572
2573 /**
2574  * Returns the right padding of the view, plus space for the right
2575  * Drawable if any.
2576  */
2577 public int getCompoundPaddingRight() {
2578     final Drawables dr = mDrawables;
2579     if (dr == null || dr.mShowing[Drawables.RIGHT] == null) {
2580         return mPaddingRight;
2581     } else {
2582         return mPaddingRight + dr.mDrawablePadding +
... dr.mDrawableSizeRight;
2583     }
2584 }
2585
2586 /**
2587  * Returns the start padding of the view, plus space for the start
2588  * Drawable if any.
2589  */
2590 public int getCompoundPaddingStart() {
2591     resolveDrawables();
2592     switch(getLayoutDirection()) {
2593         default:
2594             case LAYOUT_DIRECTION_LTR:
2595                 return getCompoundPaddingLeft();
2596             case LAYOUT_DIRECTION_RTL:
2597                 return getCompoundPaddingRight();
2598     }
2599 }
2600
2601 /**
2602  * Returns the end padding of the view, plus space for the end
2603  * Drawable if any.
2604  */
2605 public int getCompoundPaddingEnd() {
2606     resolveDrawables();
2607     switch(getLayoutDirection()) {
```

```
2608         default:
2609             case LAYOUT_DIRECTION_LTR:
2610                 return getCompoundPaddingRight();
2611             case LAYOUT_DIRECTION_RTL:
2612                 return getCompoundPaddingLeft();
2613         }
2614     }
2615
2616     /**
2617     * Returns the extended top padding of the view, including both the
2618     * top Drawable if any and any extra space to keep more than
... maxLines
2619     * of text from showing. It is only valid to call this after
... measuring.
2620     */
2621     public int getExtendedPaddingTop() {
2622         if (mMaxMode != LINES) {
2623             return getCompoundPaddingTop();
2624         }
2625
2626         if (mLayout == null) {
2627             assumeLayout();
2628         }
2629
2630         if (mLayout.getLineCount() <= mMaximum) {
2631             return getCompoundPaddingTop();
2632         }
2633
2634         int top = getCompoundPaddingTop();
2635         int bottom = getCompoundPaddingBottom();
2636         int viewht = getHeight() - top - bottom;
2637         int layoutht = mLayout.getLineTop(mMaximum);
2638
2639         if (layoutht >= viewht) {
2640             return top;
2641         }
2642
2643         final int gravity = mGravity & Gravity.VERTICAL_GRAVITY_MASK;
2644         if (gravity == Gravity.TOP) {
2645             return top;
2646         } else if (gravity == Gravity.BOTTOM) {
2647             return top + viewht - layoutht;
2648         } else { // (gravity == Gravity.CENTER_VERTICAL)
2649             return top + (viewht - layoutht) / 2;
2650         }
2651     }
2652
2653     /**
2654     * Returns the extended bottom padding of the view, including both
... the
```

```
2655     * bottom Drawable if any and any extra space to keep more than
...   maxLines
2656     * of text from showing. It is only valid to call this after
...   measuring.
2657     */
2658     public int getExtendedPaddingBottom() {
2659         if (mMaxMode != LINES) {
2660             return getCompoundPaddingBottom();
2661         }
2662
2663         if (mLayout == null) {
2664             assumeLayout();
2665         }
2666
2667         if (mLayout.getLineCount() <= mMaximum) {
2668             return getCompoundPaddingBottom();
2669         }
2670
2671         int top = getCompoundPaddingTop();
2672         int bottom = getCompoundPaddingBottom();
2673         int viewht = getHeight() - top - bottom;
2674         int layoutht = mLayout.getLineTop(mMaximum);
2675
2676         if (layoutht >= viewht) {
2677             return bottom;
2678         }
2679
2680         final int gravity = mGravity & Gravity.VERTICAL_GRAVITY_MASK;
2681         if (gravity == Gravity.TOP) {
2682             return bottom + viewht - layoutht;
2683         } else if (gravity == Gravity.BOTTOM) {
2684             return bottom;
2685         } else { // (gravity == Gravity.CENTER_VERTICAL)
2686             return bottom + (viewht - layoutht) / 2;
2687         }
2688     }
2689
2690     /**
2691     * Returns the total left padding of the view, including the left
2692     * Drawable if any.
2693     */
2694     public int getTotalPaddingLeft() {
2695         return getCompoundPaddingLeft();
2696     }
2697
2698     /**
2699     * Returns the total right padding of the view, including the right
2700     * Drawable if any.
2701     */
2702     public int getTotalPaddingRight() {
```

```
2703     return getCompoundPaddingRight();
2704 }
2705
2706 /**
2707  * Returns the total start padding of the view, including the start
2708  * Drawable if any.
2709  */
2710 public int getTotalPaddingStart() {
2711     return getCompoundPaddingStart();
2712 }
2713
2714 /**
2715  * Returns the total end padding of the view, including the end
2716  * Drawable if any.
2717  */
2718 public int getTotalPaddingEnd() {
2719     return getCompoundPaddingEnd();
2720 }
2721
2722 /**
2723  * Returns the total top padding of the view, including the top
2724  * Drawable if any, the extra space to keep more than maxLines
2725  * from showing, and the vertical offset for gravity, if any.
2726  */
2727 public int getTotalPaddingTop() {
2728     return getExtendedPaddingTop() + getVerticalOffset(true);
2729 }
2730
2731 /**
2732  * Returns the total bottom padding of the view, including the
... bottom
2733  * Drawable if any, the extra space to keep more than maxLines
2734  * from showing, and the vertical offset for gravity, if any.
2735  */
2736 public int getTotalPaddingBottom() {
2737     return getExtendedPaddingBottom() +
... getBottomVerticalOffset(true);
2738 }
2739
2740 /**
2741  * Sets the Drawables (if any) to appear to the left of, above, to
... the
2742  * right of, and below the text. Use {@code null} if you do not want
... a
2743  * Drawable there. The Drawables must already have had
2744  * {@link Drawable#setBounds} called.
2745  * <p>
2746  * Calling this method will overwrite any Drawables previously set
... using
2747  * {@link #setCompoundDrawablesRelative} or related methods.
```

```

2748 *
2749 * @attr ref android.R.styleable#TextView_drawableLeft
2750 * @attr ref android.R.styleable#TextView_drawableTop
2751 * @attr ref android.R.styleable#TextView_drawableRight
2752 * @attr ref android.R.styleable#TextView_drawableBottom
2753 */
2754 public void setCompoundDrawables(@Nullable Drawable left, @Nullable
... Drawable top,
2755     @Nullable Drawable right, @Nullable Drawable bottom) {
2756     Drawables dr = mDrawables;
2757
2758     // We're switching to absolute, discard relative.
2759     if (dr != null) {
2760         if (dr.mDrawableStart != null)
... dr.mDrawableStart.setCallback(null);
2761         dr.mDrawableStart = null;
2762         if (dr.mDrawableEnd != null)
... dr.mDrawableEnd.setCallback(null);
2763         dr.mDrawableEnd = null;
2764         dr.mDrawableSizeStart = dr.mDrawableHeightStart = 0;
2765         dr.mDrawableSizeEnd = dr.mDrawableHeightEnd = 0;
2766     }
2767
2768     final boolean drawables = left != null || top != null || right
... != null || bottom != null;
2769     if (!drawables) {
2770         // Clearing drawables... can we free the data structure?
2771         if (dr != null) {
2772             if (!dr.hasMetadata()) {
2773                 mDrawables = null;
2774             } else {
2775                 // We need to retain the last set padding, so just
... clear
2776                 // out all of the fields in the existing structure.
2777                 for (int i = dr.mShowing.length - 1; i >= 0; i--) {
2778                     if (dr.mShowing[i] != null) {
2779                         dr.mShowing[i].setCallback(null);
2780                     }
2781                     dr.mShowing[i] = null;
2782                 }
2783                 dr.mDrawableSizeLeft = dr.mDrawableHeightLeft = 0;
2784                 dr.mDrawableSizeRight = dr.mDrawableHeightRight = 0;
2785                 dr.mDrawableSizeTop = dr.mDrawableWidthTop = 0;
2786                 dr.mDrawableSizeBottom = dr.mDrawableWidthBottom =
... 0;
2787             }
2788         }
2789     } else {
2790         if (dr == null) {
2791             mDrawables = dr = new Drawables(getContext());

```

```
2792     }
2793
2794     mDrawables.mOverride = false;
2795
2796     if (dr.mShowing[Drawables.LEFT] != left &&
... dr.mShowing[Drawables.LEFT] != null) {
2797         dr.mShowing[Drawables.LEFT].setCallback(null);
2798     }
2799     dr.mShowing[Drawables.LEFT] = left;
2800
2801     if (dr.mShowing[Drawables.TOP] != top &&
... dr.mShowing[Drawables.TOP] != null) {
2802         dr.mShowing[Drawables.TOP].setCallback(null);
2803     }
2804     dr.mShowing[Drawables.TOP] = top;
2805
2806     if (dr.mShowing[Drawables.RIGHT] != right &&
... dr.mShowing[Drawables.RIGHT] != null) {
2807         dr.mShowing[Drawables.RIGHT].setCallback(null);
2808     }
2809     dr.mShowing[Drawables.RIGHT] = right;
2810
2811     if (dr.mShowing[Drawables.BOTTOM] != bottom &&
... dr.mShowing[Drawables.BOTTOM] != null) {
2812         dr.mShowing[Drawables.BOTTOM].setCallback(null);
2813     }
2814     dr.mShowing[Drawables.BOTTOM] = bottom;
2815
2816     final Rect compoundRect = dr.mCompoundRect;
2817     int[] state;
2818
2819     state = getDrawableState();
2820
2821     if (left != null) {
2822         left.setState(state);
2823         left.copyBounds(compoundRect);
2824         left.setCallback(this);
2825         dr.mDrawableSizeLeft = compoundRect.width();
2826         dr.mDrawableHeightLeft = compoundRect.height();
2827     } else {
2828         dr.mDrawableSizeLeft = dr.mDrawableHeightLeft = 0;
2829     }
2830
2831     if (right != null) {
2832         right.setState(state);
2833         right.copyBounds(compoundRect);
2834         right.setCallback(this);
2835         dr.mDrawableSizeRight = compoundRect.width();
2836         dr.mDrawableHeightRight = compoundRect.height();
2837     } else {
```

```
2838         dr.mDrawableSizeRight = dr.mDrawableHeightRight = 0;
2839     }
2840
2841     if (top != null) {
2842         top.setState(state);
2843         top.copyBounds(compoundRect);
2844         top.setCallback(this);
2845         dr.mDrawableSizeTop = compoundRect.height();
2846         dr.mDrawableWidthTop = compoundRect.width();
2847     } else {
2848         dr.mDrawableSizeTop = dr.mDrawableWidthTop = 0;
2849     }
2850
2851     if (bottom != null) {
2852         bottom.setState(state);
2853         bottom.copyBounds(compoundRect);
2854         bottom.setCallback(this);
2855         dr.mDrawableSizeBottom = compoundRect.height();
2856         dr.mDrawableWidthBottom = compoundRect.width();
2857     } else {
2858         dr.mDrawableSizeBottom = dr.mDrawableWidthBottom = 0;
2859     }
2860 }
2861
2862 // Save initial left/right drawables
2863 if (dr != null) {
2864     dr.mDrawableLeftInitial = left;
2865     dr.mDrawableRightInitial = right;
2866 }
2867
2868 resetResolvedDrawables();
2869 resolveDrawables();
2870 applyCompoundDrawableTint();
2871 invalidate();
2872 requestLayout();
2873 }
2874
2875 /**
2876  * Sets the Drawables (if any) to appear to the left of, above, to
2877  * the
2878  * right of, and below the text. Use 0 if you do not want a Drawable
2879  * there.
2880  * The Drawables' bounds will be set to their intrinsic bounds.
2881  * <p>
2882  * Calling this method will overwrite any Drawables previously set
2883  * using
2884  * {@link #setCompoundDrawablesRelative} or related methods.
2885  *
2886  * @param left Resource identifier of the left Drawable.
2887  * @param top Resource identifier of the top Drawable.
```



```

2885 * @param right Resource identifier of the right Drawable.
2886 * @param bottom Resource identifier of the bottom Drawable.
2887 *
2888 * @attr ref android.R.styleable#TextView_drawableLeft
2889 * @attr ref android.R.styleable#TextView_drawableTop
2890 * @attr ref android.R.styleable#TextView_drawableRight
2891 * @attr ref android.R.styleable#TextView_drawableBottom
2892 */
2893 @android.view.RemotableViewMethod
2894 public void setCompoundDrawablesWithIntrinsicBounds(@DrawableRes int
... left,
2895         @DrawableRes int top, @DrawableRes int right, @DrawableRes
... int bottom) {
2896     final Context context = getContext();
2897     setCompoundDrawablesWithIntrinsicBounds(left != 0 ?
... context.getDrawable(left) : null,
2898         top != 0 ? context.getDrawable(top) : null,
2899         right != 0 ? context.getDrawable(right) : null,
2900         bottom != 0 ? context.getDrawable(bottom) : null);
2901 }
2902
2903 /**
2904 * Sets the Drawables (if any) to appear to the left of, above, to
... the
2905 * right of, and below the text. Use {@code null} if you do not want
... a
2906 * Drawable there. The Drawables' bounds will be set to their
... intrinsic
2907 * bounds.
2908 * <p>
2909 * Calling this method will overwrite any Drawables previously set
... using
2910 * {@link #setCompoundDrawablesRelative} or related methods.
2911 *
2912 * @attr ref android.R.styleable#TextView_drawableLeft
2913 * @attr ref android.R.styleable#TextView_drawableTop
2914 * @attr ref android.R.styleable#TextView_drawableRight
2915 * @attr ref android.R.styleable#TextView_drawableBottom
2916 */
2917 @android.view.RemotableViewMethod
2918 public void setCompoundDrawablesWithIntrinsicBounds(@Nullable
... Drawable left,
2919         @Nullable Drawable top, @Nullable Drawable right, @Nullable
... Drawable bottom) {
2920
2921     if (left != null) {
2922         left.setBounds(0, 0, left.getIntrinsicWidth(),
... left.getIntrinsicHeight());
2923     }
2924     if (right != null) {

```

```
2925         right.setBounds(0, 0, right.getIntrinsicWidth(),
... right.getIntrinsicHeight());
2926     }
2927     if (top != null) {
2928         top.setBounds(0, 0, top.getIntrinsicWidth(),
... top.getIntrinsicHeight());
2929     }
2930     if (bottom != null) {
2931         bottom.setBounds(0, 0, bottom.getIntrinsicWidth(),
... bottom.getIntrinsicHeight());
2932     }
2933     setCompoundDrawables(left, top, right, bottom);
2934 }
2935
2936 /**
2937  * Sets the Drawables (if any) to appear to the start of, above, to
... the end
2938  * of, and below the text. Use {@code null} if you do not want a
... Drawable
2939  * there. The Drawables must already have had {@link
... Drawable#setBounds}
2940  * called.
2941  * <p>
2942  * Calling this method will overwrite any Drawables previously set
... using
2943  * {@link #setCompoundDrawables} or related methods.
2944  *
2945  * @attr ref android.R.styleable#TextView_drawableStart
2946  * @attr ref android.R.styleable#TextView_drawableTop
2947  * @attr ref android.R.styleable#TextView_drawableEnd
2948  * @attr ref android.R.styleable#TextView_drawableBottom
2949  */
2950 @android.view.RemotableViewMethod
2951 public void setCompoundDrawablesRelative(@Nullable Drawable start,
... @Nullable Drawable top,
2952     @Nullable Drawable end, @Nullable Drawable bottom) {
2953     Drawables dr = mDrawables;
2954
2955     // We're switching to relative, discard absolute.
2956     if (dr != null) {
2957         if (dr.mShowing[Drawables.LEFT] != null) {
2958             dr.mShowing[Drawables.LEFT].setCallback(null);
2959         }
2960         dr.mShowing[Drawables.LEFT] = dr.mDrawableLeftInitial =
... null;
2961         if (dr.mShowing[Drawables.RIGHT] != null) {
2962             dr.mShowing[Drawables.RIGHT].setCallback(null);
2963         }
2964         dr.mShowing[Drawables.RIGHT] = dr.mDrawableRightInitial =
... null;
```

```
2965     dr.mDrawableSizeLeft = dr.mDrawableHeightLeft = 0;
2966     dr.mDrawableSizeRight = dr.mDrawableHeightRight = 0;
2967 }
2968
2969     final boolean drawables = start != null || top != null
2970         || end != null || bottom != null;
2971
2972     if (!drawables) {
2973         // Clearing drawables... can we free the data structure?
2974         if (dr != null) {
2975             if (!dr.hasMetadata()) {
2976                 mDrawables = null;
2977             } else {
2978                 // We need to retain the last set padding, so just
2979                 // out all of the fields in the existing structure.
2980                 if (dr.mDrawableStart != null)
2981                     dr.mDrawableStart.setCallback(null);
2982                 dr.mDrawableStart = null;
2983                 if (dr.mShowing[Drawables.TOP] != null) {
2984                     dr.mShowing[Drawables.TOP].setCallback(null);
2985                 }
2986                 dr.mShowing[Drawables.TOP] = null;
2987                 if (dr.mDrawableEnd != null) {
2988                     dr.mDrawableEnd.setCallback(null);
2989                 }
2990                 dr.mDrawableEnd = null;
2991                 if (dr.mShowing[Drawables.BOTTOM] != null) {
2992                     dr.mShowing[Drawables.BOTTOM].setCallback(null);
2993                 }
2994                 dr.mShowing[Drawables.BOTTOM] = null;
2995                 dr.mDrawableSizeStart = dr.mDrawableHeightStart = 0;
2996                 dr.mDrawableSizeEnd = dr.mDrawableHeightEnd = 0;
2997                 dr.mDrawableSizeTop = dr.mDrawableWidthTop = 0;
2998                 dr.mDrawableSizeBottom = dr.mDrawableWidthBottom =
2999                 0;
3000             }
3001         }
3002     } else {
3003         if (dr == null) {
3004             mDrawables = dr = new Drawables(getContext());
3005         }
3006
3007         mDrawables.mOverride = true;
3008
3009         if (dr.mDrawableStart != start && dr.mDrawableStart != null)
3010         {
3011             dr.mDrawableStart.setCallback(null);
3012         }
3013         dr.mDrawableStart = start;
```

```
3011
3012         if (dr.mShowing[Drawables.TOP] != top &&
... dr.mShowing[Drawables.TOP] != null) {
3013             dr.mShowing[Drawables.TOP].setCallback(null);
3014         }
3015         dr.mShowing[Drawables.TOP] = top;
3016
3017         if (dr.mDrawableEnd != end && dr.mDrawableEnd != null) {
3018             dr.mDrawableEnd.setCallback(null);
3019         }
3020         dr.mDrawableEnd = end;
3021
3022         if (dr.mShowing[Drawables.BOTTOM] != bottom &&
... dr.mShowing[Drawables.BOTTOM] != null) {
3023             dr.mShowing[Drawables.BOTTOM].setCallback(null);
3024         }
3025         dr.mShowing[Drawables.BOTTOM] = bottom;
3026
3027         final Rect compoundRect = dr.mCompoundRect;
3028         int[] state;
3029
3030         state = getDrawableState();
3031
3032         if (start != null) {
3033             start.setState(state);
3034             start.copyBounds(compoundRect);
3035             start.setCallback(this);
3036             dr.mDrawableSizeStart = compoundRect.width();
3037             dr.mDrawableHeightStart = compoundRect.height();
3038         } else {
3039             dr.mDrawableSizeStart = dr.mDrawableHeightStart = 0;
3040         }
3041
3042         if (end != null) {
3043             end.setState(state);
3044             end.copyBounds(compoundRect);
3045             end.setCallback(this);
3046             dr.mDrawableSizeEnd = compoundRect.width();
3047             dr.mDrawableHeightEnd = compoundRect.height();
3048         } else {
3049             dr.mDrawableSizeEnd = dr.mDrawableHeightEnd = 0;
3050         }
3051
3052         if (top != null) {
3053             top.setState(state);
3054             top.copyBounds(compoundRect);
3055             top.setCallback(this);
3056             dr.mDrawableSizeTop = compoundRect.height();
3057             dr.mDrawableWidthTop = compoundRect.width();
3058         } else {
```

```
3059         dr.mDrawableSizeTop = dr.mDrawableWidthTop = 0;
3060     }
3061
3062     if (bottom != null) {
3063         bottom.setState(state);
3064         bottom.copyBounds(compoundRect);
3065         bottom.setCallback(this);
3066         dr.mDrawableSizeBottom = compoundRect.height();
3067         dr.mDrawableWidthBottom = compoundRect.width();
3068     } else {
3069         dr.mDrawableSizeBottom = dr.mDrawableWidthBottom = 0;
3070     }
3071 }
3072
3073     resetResolvedDrawables();
3074     resolveDrawables();
3075     invalidate();
3076     requestLayout();
3077 }
3078
3079 /**
3080  * Sets the Drawables (if any) to appear to the start of, above, to
... the end
3081  * of, and below the text. Use 0 if you do not want a Drawable
... there. The
3082  * Drawables' bounds will be set to their intrinsic bounds.
3083  * <p>
3084  * Calling this method will overwrite any Drawables previously set
... using
3085  * {@link #setCompoundDrawables} or related methods.
3086  *
3087  * @param start Resource identifier of the start Drawable.
3088  * @param top Resource identifier of the top Drawable.
3089  * @param end Resource identifier of the end Drawable.
3090  * @param bottom Resource identifier of the bottom Drawable.
3091  *
3092  * @attr ref android.R.styleable#TextView_drawableStart
3093  * @attr ref android.R.styleable#TextView_drawableTop
3094  * @attr ref android.R.styleable#TextView_drawableEnd
3095  * @attr ref android.R.styleable#TextView_drawableBottom
3096  */
3097 @android.view.RemotableViewMethod
3098 public void
... setCompoundDrawablesRelativeWithIntrinsicBounds(@DrawableRes int start,
3099         @DrawableRes int top, @DrawableRes int end, @DrawableRes int
... bottom) {
3100     final Context context = getContext();
3101     setCompoundDrawablesRelativeWithIntrinsicBounds(
3102         start != 0 ? context.getDrawable(start) : null,
3103         top != 0 ? context.getDrawable(top) : null,
```

```
3104         end != 0 ? context.getDrawable(end) : null,
3105         bottom != 0 ? context.getDrawable(bottom) : null);
3106     }
3107
3108     /**
3109     * Sets the Drawables (if any) to appear to the start of, above, to
3110     * the end
3111     * of, and below the text. Use {@code null} if you do not want a
3112     * Drawable
3113     * there. The Drawables' bounds will be set to their intrinsic
3114     * bounds.
3115     * <p>
3116     * Calling this method will overwrite any Drawables previously set
3117     * using
3118     * {@link #setCompoundDrawables} or related methods.
3119     *
3120     * @attr ref android.R.styleable#TextView_drawableStart
3121     * @attr ref android.R.styleable#TextView_drawableTop
3122     * @attr ref android.R.styleable#TextView_drawableEnd
3123     * @attr ref android.R.styleable#TextView_drawableBottom
3124     */
3125     @android.view.RemotableViewMethod
3126     public void
3127     setCompoundDrawablesRelativeWithIntrinsicBounds(@Nullable Drawable
3128     start,
3129     @Nullable Drawable top, @Nullable Drawable end, @Nullable
3130     Drawable bottom) {
3131         if (start != null) {
3132             start.setBounds(0, 0, start.getIntrinsicWidth(),
3133             start.getIntrinsicHeight());
3134         }
3135         if (end != null) {
3136             end.setBounds(0, 0, end.getIntrinsicWidth(),
3137             end.getIntrinsicHeight());
3138         }
3139         if (top != null) {
3140             top.setBounds(0, 0, top.getIntrinsicWidth(),
3141             top.getIntrinsicHeight());
3142         }
3143         if (bottom != null) {
3144             bottom.setBounds(0, 0, bottom.getIntrinsicWidth(),
3145             bottom.getIntrinsicHeight());
3146         }
3147         setCompoundDrawablesRelative(start, top, end, bottom);
3148     }
3149
3150     /**
3151     * Returns drawables for the left, top, right, and bottom borders.
3152     *
```

```
3143 * @attr ref android.R.styleable#TextView_drawableLeft
3144 * @attr ref android.R.styleable#TextView_drawableTop
3145 * @attr ref android.R.styleable#TextView_drawableRight
3146 * @attr ref android.R.styleable#TextView_drawableBottom
3147 */
3148 @NonNull
3149 public Drawable[] getCompoundDrawables() {
3150     final Drawables dr = mDrawables;
3151     if (dr != null) {
3152         return dr.mShowing.clone();
3153     } else {
3154         return new Drawable[] { null, null, null, null };
3155     }
3156 }
3157
3158 /**
3159  * Returns drawables for the start, top, end, and bottom borders.
3160  *
3161  * @attr ref android.R.styleable#TextView_drawableStart
3162  * @attr ref android.R.styleable#TextView_drawableTop
3163  * @attr ref android.R.styleable#TextView_drawableEnd
3164  * @attr ref android.R.styleable#TextView_drawableBottom
3165  */
3166 @NonNull
3167 public Drawable[] getCompoundDrawablesRelative() {
3168     final Drawables dr = mDrawables;
3169     if (dr != null) {
3170         return new Drawable[] {
3171             dr.mDrawableStart, dr.mShowing[Drawables.TOP],
3172             dr.mDrawableEnd, dr.mShowing[Drawables.BOTTOM]
3173         };
3174     } else {
3175         return new Drawable[] { null, null, null, null };
3176     }
3177 }
3178
3179 /**
3180  * Sets the size of the padding between the compound drawables and
3181  * the text.
3182  *
3183  * @attr ref android.R.styleable#TextView_drawablePadding
3184  */
3185 @android.view.RemotableViewMethod
3186 public void setCompoundDrawablePadding(int pad) {
3187     Drawables dr = mDrawables;
3188     if (pad == 0) {
3189         if (dr != null) {
3190             dr.mDrawablePadding = pad;
3191         }
3192     } else {
```



```
3193         if (dr == null) {
3194             mDrawables = dr = new Drawables(getContext());
3195         }
3196         dr.mDrawablePadding = pad;
3197     }
3198
3199     invalidate();
3200     requestLayout();
3201 }
3202
3203 /**
3204  * Returns the padding between the compound drawables and the text.
3205  *
3206  * @attr ref android.R.styleable#TextView_drawablePadding
3207  */
3208 public int getCompoundDrawablePadding() {
3209     final Drawables dr = mDrawables;
3210     return dr != null ? dr.mDrawablePadding : 0;
3211 }
3212
3213 /**
3214  * Applies a tint to the compound drawables. Does not modify the
3215  * current tint mode, which is {@link PorterDuff.Mode#SRC_IN} by
... default.
3216  * <p>
3217  * Subsequent calls to
3218  * {@link #setCompoundDrawables(Drawable, Drawable, Drawable,
... Drawable)}
3219  * and related methods will automatically mutate the drawables and
... apply
3220  * the specified tint and tint mode using
3221  * {@link Drawable#setTintList(ColorStateList)}.
3222  *
3223  * @param tint the tint to apply, may be {@code null} to clear tint
3224  *
3225  * @attr ref android.R.styleable#TextView_drawableTint
3226  * @see #getCompoundDrawableTintList()
3227  * @see Drawable#setTintList(ColorStateList)
3228  */
3229 public void setCompoundDrawableTintList(@Nullable ColorStateList
... tint) {
3230     if (mDrawables == null) {
3231         mDrawables = new Drawables(getContext());
3232     }
3233     mDrawables.mTintList = tint;
3234     mDrawables.mHasTint = true;
3235
3236     applyCompoundDrawableTint();
3237 }
3238
```

```
3239 /**
3240  * @return the tint applied to the compound drawables
3241  * @attr ref android.R.styleable#TextView_drawableTint
3242  * @see #setCompoundDrawableTintList(ColorStateList)
3243  */
3244 public ColorStateList getCompoundDrawableTintList() {
3245     return mDrawables != null ? mDrawables.mTintList : null;
3246 }
3247
3248 /**
3249  * Specifies the blending mode used to apply the tint specified by
3250  * {@link #setCompoundDrawableTintList(ColorStateList)} to the
... compound
3251  * drawables. The default mode is {@link PorterDuff.Mode#SRC_IN}.
3252  *
3253  * @param tintMode the blending mode used to apply the tint, may be
3254  *                 {@code null} to clear tint
3255  * @attr ref android.R.styleable#TextView_drawableTintMode
3256  * @see #setCompoundDrawableTintList(ColorStateList)
3257  * @see Drawable#setTintMode(PorterDuff.Mode)
3258  */
3259 public void setCompoundDrawableTintMode(@Nullable PorterDuff.Mode
... tintMode) {
3260     if (mDrawables == null) {
3261         mDrawables = new Drawables(getContext());
3262     }
3263     mDrawables.mTintMode = tintMode;
3264     mDrawables.mHasTintMode = true;
3265
3266     applyCompoundDrawableTint();
3267 }
3268
3269 /**
3270  * Returns the blending mode used to apply the tint to the compound
3271  * drawables, if specified.
3272  *
3273  * @return the blending mode used to apply the tint to the compound
3274  *         drawables
3275  * @attr ref android.R.styleable#TextView_drawableTintMode
3276  * @see #setCompoundDrawableTintMode(PorterDuff.Mode)
3277  */
3278 public PorterDuff.Mode getCompoundDrawableTintMode() {
3279     return mDrawables != null ? mDrawables.mTintMode : null;
3280 }
3281
3282 private void applyCompoundDrawableTint() {
3283     if (mDrawables == null) {
3284         return;
3285     }
3286
```

```
3287     if (mDrawables.mHasTint || mDrawables.mHasTintMode) {
3288         final ColorStateList tintList = mDrawables.mTintList;
3289         final PorterDuff.Mode tintMode = mDrawables.mTintMode;
3290         final boolean hasTint = mDrawables.mHasTint;
3291         final boolean hasTintMode = mDrawables.mHasTintMode;
3292         final int[] state = getDrawableState();
3293
3294         for (Drawable dr : mDrawables.mShowing) {
3295             if (dr == null) {
3296                 continue;
3297             }
3298
3299             if (dr == mDrawables.mDrawableError) {
3300                 // From a developer's perspective, the error
... drawable isn't
3301                 // a compound drawable. Don't apply the generic
... compound
3302                 // drawable tint to it.
3303                 continue;
3304             }
3305
3306             dr.mutate();
3307
3308             if (hasTint) {
3309                 dr.setTintList(tintList);
3310             }
3311
3312             if (hasTintMode) {
3313                 dr.setTintMode(tintMode);
3314             }
3315
3316             // The drawable (or one of its children) may not have
... been
3317             // stateful before applying the tint, so let's try
... again.
3318             if (dr.isStateful()) {
3319                 dr.setState(state);
3320             }
3321         }
3322     }
3323 }
3324
3325 @Override
3326 public void setPadding(int left, int top, int right, int bottom) {
3327     if (left != mPaddingLeft
3328         || right != mPaddingRight
3329         || top != mPaddingTop
3330         || bottom != mPaddingBottom) {
3331         nullLayouts();
3332     }
}
```

```
3333
3334     // the super call will requestLayout()
3335     super.setPadding(left, top, right, bottom);
3336     invalidate();
3337 }
3338
3339 @Override
3340 public void setPaddingRelative(int start, int top, int end, int
... bottom) {
3341     if (start != getPaddingStart()
3342         || end != getPaddingEnd()
3343         || top != mPaddingTop
3344         || bottom != mPaddingBottom) {
3345         nullLayouts();
3346     }
3347
3348     // the super call will requestLayout()
3349     super.setPaddingRelative(start, top, end, bottom);
3350     invalidate();
3351 }
3352
3353 /**
3354  * Gets the autolink mask of the text. See {@link
3355  * android.text.util.Linkify#ALL Linkify.ALL} and peers for
3356  * possible values.
3357  *
3358  * @attr ref android.R.styleable#TextView_autoLink
3359  */
3360 public final int getAutoLinkMask() {
3361     return mAutoLinkMask;
3362 }
3363
3364 /**
3365  * Sets the text appearance from the specified style resource.
3366  * <p>
3367  * Use a framework-defined {@code TextAppearance} style like
3368  * {@link android.R.style#TextAppearance_Material_Body1
... @android:style/TextAppearance.Material.Body1}
3369  * or see {@link android.R.styleable#TextAppearance TextAppearance}
... for the
3370  * set of attributes that can be used in a custom style.
3371  *
3372  * @param resId the resource identifier of the style to apply
3373  * @attr ref android.R.styleable#TextView_textAppearance
3374  */
3375 @SuppressWarnings("deprecation")
3376 public void setTextAppearance(@StyleRes int resId) {
3377     setTextAppearance(mContext, resId);
3378 }
3379
```

```
3380 /**
3381  * Sets the text color, size, style, hint color, and highlight color
3382  * from the specified TextAppearance resource.
3383  *
3384  * @deprecated Use {@link #setTextAppearance(int)} instead.
3385  */
3386 @Deprecated
3387 public void setTextAppearance(Context context, @StyleRes int resId)
... {
3388     final TypedArray ta = context.obtainStyledAttributes(resId,
... R.styleable.TextAppearance);
3389
3390     final int textColorHighlight = ta.getColor(
3391         R.styleable.TextAppearance_textColorHighlight, 0);
3392     if (textColorHighlight != 0) {
3393         setHighlightColor(textColorHighlight);
3394     }
3395
3396     final ColorStateList textColor =
... ta.getColorStateList(R.styleable.TextAppearance_textColor);
3397     if (textColor != null) {
3398         setTextColor(textColor);
3399     }
3400
3401     final int textSize =
... ta.getDimensionPixelSize(R.styleable.TextAppearance_textSize, 0);
3402     if (textSize != 0) {
3403         setRawTextSize(textSize, true /* shouldRequestLayout */);
3404     }
3405
3406     final ColorStateList textColorHint = ta.getColorStateList(
3407         R.styleable.TextAppearance_textColorHint);
3408     if (textColorHint != null) {
3409         setHintTextColor(textColorHint);
3410     }
3411
3412     final ColorStateList textColorLink = ta.getColorStateList(
3413         R.styleable.TextAppearance_textColorLink);
3414     if (textColorLink != null) {
3415         setLinkTextColor(textColorLink);
3416     }
3417
3418     Typeface fontTypeface = null;
3419     String fontFamily = null;
3420     if (!context.isRestricted() && context.canLoadUnsafeResources())
... {
3421         try {
3422             fontTypeface =
... ta.getFont(R.styleable.TextAppearance_fontFamily);
3423         } catch (UnsupportedOperationException |
```

```
3423... Resources.NotFoundException e) {
3424     // Expected if it is not a font resource.
3425 }
3426 }
3427     if (fontTypeface == null) {
3428         fontFamily =
... ta.getString(R.styleable.TextAppearance_fontFamily);
3429     }
3430     final int typefaceIndex =
... ta.getInt(R.styleable.TextAppearance_typeface, -1);
3431     final int styleIndex =
... ta.getInt(R.styleable.TextAppearance_textStyle, -1);
3432     setTypefaceFromAttrs(fontTypeface, fontFamily, typefaceIndex,
... styleIndex);
3433
3434     final int shadowColor =
... ta.getInt(R.styleable.TextAppearance_shadowColor, 0);
3435     if (shadowColor != 0) {
3436         final float dx =
... ta.getFloat(R.styleable.TextAppearance_shadowDx, 0);
3437         final float dy =
... ta.getFloat(R.styleable.TextAppearance_shadowDy, 0);
3438         final float r =
... ta.getFloat(R.styleable.TextAppearance_shadowRadius, 0);
3439         setShadowLayer(r, dx, dy, shadowColor);
3440     }
3441
3442     if (ta.getBoolean(R.styleable.TextAppearance_textAllCaps,
... false)) {
3443         setTransformationMethod(new
... AllCapsTransformationMethod(getContext()));
3444     }
3445
3446     if (ta.hasValue(R.styleable.TextAppearance_elegantTextHeight)) {
3447         setElegantTextHeight(ta.getBoolean(
3448             R.styleable.TextAppearance_elegantTextHeight,
... false));
3449     }
3450
3451     if (ta.hasValue(R.styleable.TextAppearance_letterSpacing)) {
3452         setLetterSpacing(ta.getFloat(
3453             R.styleable.TextAppearance_letterSpacing, 0));
3454     }
3455
3456     if (ta.hasValue(R.styleable.TextAppearance_fontFeatureSettings))
... {
3457         setFontFeatureSettings(ta.getString(
3458             R.styleable.TextAppearance_fontFeatureSettings));
3459     }
3460
```

```
3461 ta.recycle();
3462 }
3463
3464 /**
3465  * Get the default primary {@link Locale} of the text in this
... TextView. This will always be
3466  * the first member of {@link #getTextLocales()}.
3467  * @return the default primary {@link Locale} of the text in this
... TextView.
3468  */
3469 @NonNull
3470 public Locale getTextLocale() {
3471     return mTextPaint.getTextLocale();
3472 }
3473
3474 /**
3475  * Get the default {@link LocaleList} of the text in this TextView.
3476  * @return the default {@link LocaleList} of the text in this
... TextView.
3477  */
3478 @NonNull @Size(min = 1)
3479 public LocaleList getTextLocales() {
3480     return mTextPaint.getTextLocales();
3481 }
3482
3483 private void changeListenerLocaleTo(@Nullable Locale locale) {
3484     if (mListenerChanged) {
3485         // If a listener has been explicitly set, don't change it.
... We may break something.
3486         return;
3487     }
3488     // The following null check is not absolutely necessary since
... all calling points of
3489     // changeListenerLocaleTo() guarantee a non-null mEditor at the
... moment. But this is left
3490     // here in case others would want to call this method in the
... future.
3491     if (mEditor != null) {
3492         KeyListener listener = mEditor.mKeyListener;
3493         if (listener instanceof DigitsKeyListener) {
3494             listener = DigitsKeyListener.getInstance(locale,
... (DigitsKeyListener) listener);
3495         } else if (listener instanceof DateKeyListener) {
3496             listener = DateKeyListener.getInstance(locale);
3497         } else if (listener instanceof TimeKeyListener) {
3498             listener = TimeKeyListener.getInstance(locale);
3499         } else if (listener instanceof DateTimeKeyListener) {
3500             listener = DateTimeKeyListener.getInstance(locale);
3501         } else {
3502             return;
```



```
3503     }
3504     final boolean wasPasswordType =
... isPasswordInputType(mEditor.mInputType);
3505     setKeyListenerOnly(listener);
3506     setInputTypeFromEditor();
3507     if (wasPasswordType) {
3508         final int newInputClass = mEditor.mInputType &
... EditorInfo.TYPE_MASK_CLASS;
3509         if (newInputClass == EditorInfo.TYPE_CLASS_TEXT) {
3510             mEditor.mInputType |=
... EditorInfo.TYPE_TEXT_VARIATION_PASSWORD;
3511         } else if (newInputClass ==
... EditorInfo.TYPE_CLASS_NUMBER) {
3512             mEditor.mInputType |=
... EditorInfo.TYPE_NUMBER_VARIATION_PASSWORD;
3513         }
3514     }
3515 }
3516 }
3517
3518 /**
3519  * Set the default {@link Locale} of the text in this TextView to a
... one-member
3520  * {@link LocaleList} containing just the given Locale.
3521  *
3522  * @param locale the {@link Locale} for drawing text, must not be
... null.
3523  *
3524  * @see #setTextLocales
3525  */
3526 public void setTextLocale(@NonNull Locale locale) {
3527     mLocalesChanged = true;
3528     mTextPaint.setTextLocale(locale);
3529     if (mLayout != null) {
3530         nullLayouts();
3531         requestLayout();
3532         invalidate();
3533     }
3534 }
3535
3536 /**
3537  * Set the default {@link LocaleList} of the text in this TextView
... to the given value.
3538  *
3539  * This value is used to choose appropriate typefaces for ambiguous
... characters (typically used
3540  * for CJK locales to disambiguate Hanzi/Kanji/Hanja characters). It
... also affects
3541  * other aspects of text display, including line breaking.
3542  *
```

```
3543 * @param locales the {@link LocaleList} for drawing text, must not
... be null or empty.
3544 *
3545 * @see Paint#setTextLocales
3546 */
3547 public void setTextLocales(@NonNull @Size(min = 1) LocaleList
... locales) {
3548     mLocalesChanged = true;
3549     mTextPaint.setTextLocales(locales);
3550     if (mLayout != null) {
3551         nullLayouts();
3552         requestLayout();
3553         invalidate();
3554     }
3555 }
3556
3557 @Override
3558 protected void onConfigurationChanged(Configuration newConfig) {
3559     super.onConfigurationChanged(newConfig);
3560     if (!mLocalesChanged) {
3561         mTextPaint.setTextLocales(LocaleList.getDefault());
3562         if (mLayout != null) {
3563             nullLayouts();
3564             requestLayout();
3565             invalidate();
3566         }
3567     }
3568 }
3569
3570 /**
3571 * @return the size (in pixels) of the default text size in this
... TextView.
3572 */
3573 @ViewDebug.ExportedProperty(category = "text")
3574 public float getTextSize() {
3575     return mTextPaint.getTextSize();
3576 }
3577
3578 /**
3579 * @return the size (in scaled pixels) of the default text size in
... this TextView.
3580 * @hide
3581 */
3582 @ViewDebug.ExportedProperty(category = "text")
3583 public float getScaledTextSize() {
3584     return mTextPaint.getTextSize() / mTextPaint.density;
3585 }
3586
3587 /** @hide */
3588 @ViewDebug.ExportedProperty(category = "text", mapping = {
```

```
3589     @ViewDebug.IntToString(from = Typeface.NORMAL, to =
...     "NORMAL"),
3590     @ViewDebug.IntToString(from = Typeface.BOLD, to = "BOLD"),
3591     @ViewDebug.IntToString(from = Typeface.ITALIC, to =
...     "ITALIC"),
3592     @ViewDebug.IntToString(from = Typeface.BOLD_ITALIC, to =
...     "BOLD_ITALIC")
3593     })
3594     public int getTypefaceStyle() {
3595         Typeface typeface = mTextPaint.getTypeface();
3596         return typeface != null ? typeface.getStyle() : Typeface.NORMAL;
3597     }
3598
3599     /**
3600     * Set the default text size to the given value, interpreted as
... "scaled
3601     * pixel" units. This size is adjusted based on the current density
... and
3602     * user font size preference.
3603     *
3604     * <p>Note: if this TextView has the auto-size feature enabled than
... this function is no-op.
3605     *
3606     * @param size The scaled pixel size.
3607     *
3608     * @attr ref android.R.styleable#TextView_textSize
3609     */
3610     @android.view.RemotableViewMethod
3611     public void setTextSize(float size) {
3612         setTextSize(TypedValue.COMPLEX_UNIT_SP, size);
3613     }
3614
3615     /**
3616     * Set the default text size to a given unit and value. See {@link
3617     * TypedValue} for the possible dimension units.
3618     *
3619     * <p>Note: if this TextView has the auto-size feature enabled than
... this function is no-op.
3620     *
3621     * @param unit The desired dimension unit.
3622     * @param size The desired size in the given units.
3623     *
3624     * @attr ref android.R.styleable#TextView_textSize
3625     */
3626     public void setTextSize(int unit, float size) {
3627         if (!isAutoSizeEnabled()) {
3628             setTextSizeInternal(unit, size, true /* shouldRequestLayout
... */);
3629     }
3630 }
```

```
3631
3632     private void setTextSizeInternal(int unit, float size, boolean
... shouldRequestLayout) {
3633         Context c = getContext();
3634         Resources r;
3635
3636         if (c == null) {
3637             r = Resources.getSystem();
3638         } else {
3639             r = c.getResources();
3640         }
3641
3642         setRawTextSize(TypedValue.applyDimension(unit, size,
... r.getDisplayMetrics()),
3643             shouldRequestLayout);
3644     }
3645
3646     private void setRawTextSize(float size, boolean shouldRequestLayout)
... {
3647         if (size != mTextPaint.getTextSize()) {
3648             mTextPaint.setTextSize(size);
3649
3650             if (shouldRequestLayout && mLayout != null) {
3651                 // Do not auto-size right after setting the text size.
3652                 mNeedsAutoSizeText = false;
3653                 nullLayouts();
3654                 requestLayout();
3655                 invalidate();
3656             }
3657         }
3658     }
3659
3660     /**
3661     * Gets the extent by which text should be stretched horizontally.
3662     * This will usually be 1.0.
3663     * @return The horizontal scale factor.
3664     */
3665     public float getTextScaleX() {
3666         return mTextPaint.getTextScaleX();
3667     }
3668
3669     /**
3670     * Sets the horizontal scale factor for text. The default value
3671     * is 1.0. Values greater than 1.0 stretch the text wider.
3672     * Values less than 1.0 make the text narrower. By default, this
... value is 1.0.
3673     * @param size The horizontal scale factor.
3674     * @attr ref android.R.styleable#TextView_textScaleX
3675     */
3676     @android.view.RemotableViewMethod
```

```
3677 public void setTextScaleX(float size) {
3678     if (size != mTextPaint.getTextScaleX()) {
3679         mUserSetTextScaleX = true;
3680         mTextPaint.setTextScaleX(size);
3681
3682         if (mLayout != null) {
3683             nullLayouts();
3684             requestLayout();
3685             invalidate();
3686         }
3687     }
3688 }
3689
3690 /**
3691  * Sets the typeface and style in which the text should be
... displayed.
3692  * Note that not all Typeface families actually have bold and italic
3693  * variants, so you may need to use
3694  * {@link #setTypeface(Typeface, int)} to get the appearance
3695  * that you actually want.
3696  *
3697  * @see #getTypeface()
3698  *
3699  * @attr ref android.R.styleable#TextView_fontFamily
3700  * @attr ref android.R.styleable#TextView_typeface
3701  * @attr ref android.R.styleable#TextView_textStyle
3702  */
3703 public void setTypeface(Typeface tf) {
3704     if (mTextPaint.getTypeface() != tf) {
3705         mTextPaint.setTypeface(tf);
3706
3707         if (mLayout != null) {
3708             nullLayouts();
3709             requestLayout();
3710             invalidate();
3711         }
3712     }
3713 }
3714
3715 /**
3716  * Gets the current {@link Typeface} that is used to style the text.
3717  * @return The current Typeface.
3718  *
3719  * @see #setTypeface(Typeface)
3720  *
3721  * @attr ref android.R.styleable#TextView_fontFamily
3722  * @attr ref android.R.styleable#TextView_typeface
3723  * @attr ref android.R.styleable#TextView_textStyle
3724  */
3725 public Typeface getTypeface() {
```

```
3726     return mTextPaint.getTypeface();
3727 }
3728
3729 /**
3730  * Set the TextView's elegant height metrics flag. This setting
... selects font
3731  * variants that have not been compacted to fit Latin-based vertical
3732  * metrics, and also increases top and bottom bounds to provide more
... space.
3733  *
3734  * @param elegant set the paint's elegant metrics flag.
3735  *
3736  * @attr ref android.R.styleable#TextView_elegantTextHeight
3737  */
3738 public void setElegantTextHeight(boolean elegant) {
3739     if (elegant != mTextPaint.isElegantTextHeight()) {
3740         mTextPaint.setElegantTextHeight(elegant);
3741         if (mLayout != null) {
3742             nullLayouts();
3743             requestLayout();
3744             invalidate();
3745         }
3746     }
3747 }
3748
3749 /**
3750  * Gets the text letter-space value, which determines the spacing
... between characters.
3751  * The value returned is in ems. Normally, this value is 0.0.
3752  * @return The text letter-space value in ems.
3753  *
3754  * @see #setLetterSpacing(float)
3755  * @see Paint#setLetterSpacing
3756  */
3757 public float getLetterSpacing() {
3758     return mTextPaint.getLetterSpacing();
3759 }
3760
3761 /**
3762  * Sets text letter-spacing in em units. Typical values
3763  * for slight expansion will be around 0.05. Negative values
... tighten text.
3764  *
3765  * @see #getLetterSpacing()
3766  * @see Paint#getLetterSpacing
3767  *
3768  * @param letterSpacing A text letter-space value in ems.
3769  * @attr ref android.R.styleable#TextView_letterSpacing
3770  */
3771 @android.view.RemotableViewMethod
```

```
3772 public void setLetterSpacing(float letterSpacing) {
3773     if (letterSpacing != mTextPaint.getLetterSpacing()) {
3774         mTextPaint.setLetterSpacing(letterSpacing);
3775
3776         if (mLayout != null) {
3777             nullLayouts();
3778             requestLayout();
3779             invalidate();
3780         }
3781     }
3782 }
3783
3784 /**
3785  * Returns the font feature settings. The format is the same as the
... CSS
3786  * font-feature-settings attribute:
3787  * <a
... href="https://www.w3.org/TR/css-fonts-3/#font-feature-settings-prop">
3788  *
... https://www.w3.org/TR/css-fonts-3/#font-feature-settings-prop</a>
3789  *
3790  * @return the currently set font feature settings. Default is
... null.
3791  *
3792  * @see #setFontFeatureSettings(String)
3793  * @see Paint#setFontFeatureSettings(String)
... Paint.setFontFeatureSettings(String)
3794  */
3795 @Nullable
3796 public String getFontFeatureSettings() {
3797     return mTextPaint.getFontFeatureSettings();
3798 }
3799
3800 /**
3801  * Returns the font variation settings.
3802  *
3803  * @return the currently set font variation settings. Returns null
... if no variation is
3804  * specified.
3805  *
3806  * @see #setFontVariationSettings(String)
3807  * @see Paint#setFontVariationSettings(String)
... Paint.setFontVariationSettings(String)
3808  */
3809 @Nullable
3810 public String getFontVariationSettings() {
3811     return mTextPaint.getFontVariationSettings();
3812 }
3813
3814 /**
```



```
3815 * Sets the break strategy for breaking paragraphs into lines. The
... default value for
3816 * TextView is {@link Layout#BREAK_STRATEGY_HIGH_QUALITY}, and the
... default value for
3817 * EditText is {@link Layout#BREAK_STRATEGY_SIMPLE}, the latter to
... avoid the
3818 * text "dancing" when being edited.
3819 *
3820 * @attr ref android.R.styleable#TextView_breakStrategy
3821 * @see #getBreakStrategy()
3822 */
3823 public void setBreakStrategy(@Layout.BreakStrategy int
... breakStrategy) {
3824     mBreakStrategy = breakStrategy;
3825     if (mLayout != null) {
3826         nullLayouts();
3827         requestLayout();
3828         invalidate();
3829     }
3830 }
3831
3832 /**
3833 * Gets the current strategy for breaking paragraphs into lines.
3834 * @return the current strategy for breaking paragraphs into lines.
3835 *
3836 * @attr ref android.R.styleable#TextView_breakStrategy
3837 * @see #setBreakStrategy(int)
3838 */
3839 @Layout.BreakStrategy
3840 public int getBreakStrategy() {
3841     return mBreakStrategy;
3842 }
3843
3844 /**
3845 * Sets the frequency of automatic hyphenation to use when
... determining word breaks.
3846 * The default value for both TextView and {@link EditText} is
3847 * {@link Layout#HYPHENATION_FREQUENCY_NORMAL}.
3848 * Note that the default hyphenation frequency value is set from the
... theme.
3849 *
3850 * @param hyphenationFrequency The hyphenation frequency to use.
3851 * @attr ref android.R.styleable#TextView_hyphenationFrequency
3852 * @see #getHyphenationFrequency()
3853 */
3854 public void setHyphenationFrequency(@Layout.HyphenationFrequency int
... hyphenationFrequency) {
3855     mHyphenationFrequency = hyphenationFrequency;
3856     if (mLayout != null) {
3857         nullLayouts();
```

```
3858         requestLayout();
3859         invalidate();
3860     }
3861 }
3862
3863 /**
3864  * Gets the current frequency of automatic hyphenation to be used
... when determining word breaks.
3865  * @return the current frequency of automatic hyphenation to be used
... when determining word
3866  * breaks.
3867  *
3868  * @attr ref android.R.styleable#TextView_hyphenationFrequency
3869  * @see #setHyphenationFrequency(int)
3870 */
3871 @Layout.HyphenationFrequency
3872 public int getHyphenationFrequency() {
3873     return mHyphenationFrequency;
3874 }
3875
3876 /**
3877  * Set justification mode. The default value is {@link
... Layout#JUSTIFICATION_MODE_NONE}. If the
3878  * last line is too short for justification, the last line will be
... displayed with the
3879  * alignment set by {@link android.view.View#setTextAlignment}.
3880  *
3881  * @see #getJustificationMode()
3882 */
3883 @Layout.JustificationMode
3884 public void setJustificationMode(@Layout.JustificationMode int
... justificationMode) {
3885     mJustificationMode = justificationMode;
3886     if (mLayout != null) {
3887         nullLayouts();
3888         requestLayout();
3889         invalidate();
3890     }
3891 }
3892
3893 /**
3894  * @return true if currently paragraph justification mode.
3895  *
3896  * @see #setJustificationMode(int)
3897 */
3898 public @Layout.JustificationMode int getJustificationMode() {
3899     return mJustificationMode;
3900 }
3901
3902 /**
```

```
3903 * Sets font feature settings. The format is the same as the CSS
3904 * font-feature-settings attribute:
3905 * <a
... href="https://www.w3.org/TR/css-fonts-3/#font-feature-settings-prop">
3906 *
... https://www.w3.org/TR/css-fonts-3/#font-feature-settings-prop</a>
3907 *
3908 * @param fontFeatureSettings font feature settings represented as
... CSS compatible string
3909 *
3910 * @see #getFontFeatureSettings()
3911 * @see Paint#getFontFeatureSettings()
... Paint.getFontFeatureSettings()
3912 *
3913 * @attr ref android.R.styleable#TextView_fontFeatureSettings
3914 */
3915 @android.view.RemotableViewMethod
3916 public void setFontFeatureSettings(@Nullable String
... fontFeatureSettings) {
3917     if (fontFeatureSettings != mTextPaint.getFontFeatureSettings())
... {
3918         mTextPaint.setFontFeatureSettings(fontFeatureSettings);
3919
3920         if (mLayout != null) {
3921             nullLayouts();
3922             requestLayout();
3923             invalidate();
3924         }
3925     }
3926 }
3927
3928
3929 /**
3930 * Sets TrueType or OpenType font variation settings. The settings
... string is constructed from
3931 * multiple pairs of axis tag and style values. The axis tag must
... contain four ASCII characters
3932 * and must be wrapped with single quotes (U+0027) or double quotes
... (U+0022). Axis strings that
3933 * are longer or shorter than four characters, or contain characters
... outside of U+0020..U+007E
3934 * are invalid. If a specified axis name is not defined in the font,
... the settings will be
3935 * ignored.
3936 *
3937 * <p>
3938 * Examples,
3939 * <ul>
3940 * <li>Set font width to 150.
3941 * <pre>
```

```
3942 * <code>
3943 *   TextView textView = (TextView) findViewById(R.id.textView);
3944 *   textView.setFontVariationSettings("'wdth' 150");
3945 * </code>
3946 * </pre>
3947 * </li>
3948 *
3949 * <li>Set the font slant to 20 degrees and ask for italic style.
3950 * <pre>
3951 * <code>
3952 *   TextView textView = (TextView) findViewById(R.id.textView);
3953 *   textView.setFontVariationSettings("'slnt' 20, 'ital' 1");
3954 * </code>
3955 * </pre>
3956 * </p>
3957 * </li>
3958 * </ul>
3959 *
3960 * @param fontVariationSettings font variation settings. You can
... pass null or empty string as
3961 *           no variation settings.
3962 * @return true if the given settings is effective to at least one
... font file underlying this
3963 *         TextView. This function also returns true for empty
... settings string. Otherwise
3964 *         returns false.
3965 *
3966 * @throws IllegalArgumentException If given string is not a valid
... font variation settings
3967 *           format.
3968 *
3969 * @see #getFontVariationSettings()
3970 * @see FontVariationAxis
3971 */
3972 public boolean setFontVariationSettings(@Nullable String
... fontVariationSettings) {
3973     final String existingSettings =
... mTextPaint.getFontVariationSettings();
3974     if (fontVariationSettings == existingSettings
3975         || (fontVariationSettings != null
3976             &&
... fontVariationSettings.equals(existingSettings))) {
3977         return true;
3978     }
3979     boolean effective =
... mTextPaint.setFontVariationSettings(fontVariationSettings);
3980
3981     if (effective && mLayout != null) {
3982         nullLayouts();
3983         requestLayout();
```

```
3984         invalidate();
3985     }
3986     return effective;
3987 }
3988
3989 /**
3990  * Sets the text color for all the states (normal, selected,
3991  * focused) to be this color.
3992  *
3993  * @param color A color value in the form 0xAARRGGBB.
3994  * Do not pass a resource ID. To get a color value from a resource
... ID, call
3995  * {@link android.support.v4.content.ContextCompat#getColor(Context,
... int) getColor}.
3996  *
3997  * @see #setTextColor(ColorStateList)
3998  * @see #getTextColors()
3999  *
4000  * @attr ref android.R.styleable#TextView_textColor
4001  */
4002 @android.view.RemotableViewMethod
4003 public void setTextColor(@ColorInt int color) {
4004     mTextColor = ColorStateList.valueOf(color);
4005     updateTextColors();
4006 }
4007
4008 /**
4009  * Sets the text color.
4010  *
4011  * @see #setTextColor(int)
4012  * @see #getTextColors()
4013  * @see #setHintTextColor(ColorStateList)
4014  * @see #setLinkTextColor(ColorStateList)
4015  *
4016  * @attr ref android.R.styleable#TextView_textColor
4017  */
4018 @android.view.RemotableViewMethod
4019 public void setTextColor(ColorStateList colors) {
4020     if (colors == null) {
4021         throw new NullPointerException();
4022     }
4023
4024     mTextColor = colors;
4025     updateTextColors();
4026 }
4027
4028 /**
4029  * Gets the text colors for the different states (normal, selected,
... focused) of the TextView.
4030  *
```

```
4031 * @see #setTextColor(ColorStateList)
4032 * @see #setTextColor(int)
4033 *
4034 * @attr ref android.R.styleable#TextView_textColor
4035 */
4036 public final ColorStateList getTextColor() {
4037     return mTextColor;
4038 }
4039
4040 /**
4041 * Return the current color selected for normal text.
4042 *
4043 * @return Returns the current text color.
4044 */
4045 @ColorInt
4046 public final int getCurrentTextColor() {
4047     return mCurTextColor;
4048 }
4049
4050 /**
4051 * Sets the color used to display the selection highlight.
4052 *
4053 * @attr ref android.R.styleable#TextView_textColorHighlight
4054 */
4055 @android.view.RemotableViewMethod
4056 public void setHighlightColor(@ColorInt int color) {
4057     if (mHighlightColor != color) {
4058         mHighlightColor = color;
4059         invalidate();
4060     }
4061 }
4062
4063 /**
4064 * @return the color used to display the selection highlight
4065 *
4066 * @see #setHighlightColor(int)
4067 *
4068 * @attr ref android.R.styleable#TextView_textColorHighlight
4069 */
4070 @ColorInt
4071 public int getHighlightColor() {
4072     return mHighlightColor;
4073 }
4074
4075 /**
4076 * Sets whether the soft input method will be made visible when this
4077 * TextView gets focused. The default is true.
4078 */
4079 @android.view.RemotableViewMethod
4080 public final void setShowSoftInputOnFocus(boolean show) {
```

```
4081     createEditorIfNeeded();
4082     mEditor.mShowSoftInputOnFocus = show;
4083 }
4084
4085 /**
4086  * Returns whether the soft input method will be made visible when
... this
4087  * TextView gets focused. The default is true.
4088  */
4089 public final boolean getShowSoftInputOnFocus() {
4090     // When there is no Editor, return default true value
4091     return mEditor == null || mEditor.mShowSoftInputOnFocus;
4092 }
4093
4094 /**
4095  * Gives the text a shadow of the specified blur radius and color,
... the specified
4096  * distance from its drawn position.
4097  * <p>
4098  * The text shadow produced does not interact with the properties on
... view
4099  * that are responsible for real time shadows,
4100  * {@link View#getElevation() elevation} and
4101  * {@link View#getTranslationZ() translationZ}.
4102  *
4103  * @see Paint#setShadowLayer(float, float, float, int)
4104  *
4105  * @attr ref android.R.styleable#TextView_shadowColor
4106  * @attr ref android.R.styleable#TextView_shadowDx
4107  * @attr ref android.R.styleable#TextView_shadowDy
4108  * @attr ref android.R.styleable#TextView_shadowRadius
4109  */
4110 public void setShadowLayer(float radius, float dx, float dy, int
... color) {
4111     mTextPaint.setShadowLayer(radius, dx, dy, color);
4112
4113     mShadowRadius = radius;
4114     mShadowDx = dx;
4115     mShadowDy = dy;
4116     mShadowColor = color;
4117
4118     // Will change text clip region
4119     if (mEditor != null) {
4120         mEditor.invalidateTextDisplayList();
4121         mEditor.invalidateHandlesAndActionMode();
4122     }
4123     invalidate();
4124 }
4125
4126 /**
```



```
4127 * Gets the radius of the shadow layer.
4128 *
4129 * @return the radius of the shadow layer. If 0, the shadow layer is
... not visible
4130 *
4131 * @see #setShadowLayer(float, float, float, int)
4132 *
4133 * @attr ref android.R.styleable#TextView_shadowRadius
4134 */
4135 public float getShadowRadius() {
4136     return mShadowRadius;
4137 }
4138
4139 /**
4140 * @return the horizontal offset of the shadow layer
4141 *
4142 * @see #setShadowLayer(float, float, float, int)
4143 *
4144 * @attr ref android.R.styleable#TextView_shadowDx
4145 */
4146 public float getShadowDx() {
4147     return mShadowDx;
4148 }
4149
4150 /**
4151 * Gets the vertical offset of the shadow layer.
4152 * @return The vertical offset of the shadow layer.
4153 *
4154 * @see #setShadowLayer(float, float, float, int)
4155 *
4156 * @attr ref android.R.styleable#TextView_shadowDy
4157 */
4158 public float getShadowDy() {
4159     return mShadowDy;
4160 }
4161
4162 /**
4163 * Gets the color of the shadow layer.
4164 * @return the color of the shadow layer
4165 *
4166 * @see #setShadowLayer(float, float, float, int)
4167 *
4168 * @attr ref android.R.styleable#TextView_shadowColor
4169 */
4170 @ColorInt
4171 public int getShadowColor() {
4172     return mShadowColor;
4173 }
4174
4175 /**
```

```
4176 * Gets the {@link TextPaint} used for the text.
4177 * Use this only to consult the Paint's properties and not to change
... them.
4178 * @return The base paint used for the text.
4179 */
4180 public TextPaint getPaint() {
4181     return mTextPaint;
4182 }
4183
4184 /**
4185 * Sets the autolink mask of the text. See {@link
4186 * android.text.util.Linkify#ALL Linkify.ALL} and peers for
4187 * possible values.
4188 *
4189 * @attr ref android.R.styleable#TextView_autoLink
4190 */
4191 @android.view.RemotableViewMethod
4192 public final void setAutoLinkMask(int mask) {
4193     mAutoLinkMask = mask;
4194 }
4195
4196 /**
4197 * Sets whether the movement method will automatically be set to
4198 * {@link LinkMovementMethod} if {@link #setAutoLinkMask} has been
4199 * set to nonzero and links are detected in {@link #setText}.
4200 * The default is true.
4201 *
4202 * @attr ref android.R.styleable#TextView_linksClickable
4203 */
4204 @android.view.RemotableViewMethod
4205 public final void setLinksClickable(boolean whether) {
4206     mLinksClickable = whether;
4207 }
4208
4209 /**
4210 * Returns whether the movement method will automatically be set to
4211 * {@link LinkMovementMethod} if {@link #setAutoLinkMask} has been
4212 * set to nonzero and links are detected in {@link #setText}.
4213 * The default is true.
4214 *
4215 * @attr ref android.R.styleable#TextView_linksClickable
4216 */
4217 public final boolean getLinksClickable() {
4218     return mLinksClickable;
4219 }
4220
4221 /**
4222 * Returns the list of {@link android.text.style.URLSpan URLSpans}
... attached to the text
4223 * (by {@link Linkify} or otherwise) if any. You can call
```

```

4224 * {@link URLSpan#getURL} on them to find where they link to
4225 * or use {@link Spanned#getSpanStart} and {@link
... Spanned#getSpanEnd}
4226 * to find the region of the text they are attached to.
4227 */
4228 public URLSpan[] getUrls() {
4229     if (mText instanceof Spanned) {
4230         return ((Spanned) mText).getSpans(0, mText.length(),
... URLSpan.class);
4231     } else {
4232         return new URLSpan[0];
4233     }
4234 }
4235
4236 /**
4237  * Sets the color of the hint text for all the states (disabled,
... focussed, selected...) of this
4238  * TextView.
4239  *
4240  * @see #setHintTextColor(ColorStateList)
4241  * @see #getHintTextColors()
4242  * @see #setTextColor(int)
4243  *
4244  * @attr ref android.R.styleable#TextView_textColorHint
4245  */
4246 @android.view.RemotableViewMethod
4247 public final void setHintTextColor(@ColorInt int color) {
4248     mHintTextColor = ColorStateList.valueOf(color);
4249     updateTextColors();
4250 }
4251
4252 /**
4253  * Sets the color of the hint text.
4254  *
4255  * @see #getHintTextColors()
4256  * @see #setHintTextColor(int)
4257  * @see #setTextColor(ColorStateList)
4258  * @see #setLinkTextColor(ColorStateList)
4259  *
4260  * @attr ref android.R.styleable#TextView_textColorHint
4261  */
4262 public final void setHintTextColor(ColorStateList colors) {
4263     mHintTextColor = colors;
4264     updateTextColors();
4265 }
4266
4267 /**
4268  * @return the color of the hint text, for the different states of
... this TextView.
4269  *

```

```
4270 * @see #setHintTextColor(ColorStateList)
4271 * @see #setHintTextColor(int)
4272 * @see #setTextColor(ColorStateList)
4273 * @see #setLinkTextColor(ColorStateList)
4274 *
4275 * @attr ref android.R.styleable#TextView_textColorHint
4276 */
4277 public final ColorStateList getHintTextColors() {
4278     return mHintTextColor;
4279 }
4280
4281 /**
4282 * <p>Return the current color selected to paint the hint text.</p>
4283 *
4284 * @return Returns the current hint text color.
4285 */
4286 @ColorInt
4287 public final int getCurrentHintTextColor() {
4288     return mHintTextColor != null ? mCurHintTextColor :
... mCurTextColor;
4289 }
4290
4291 /**
4292 * Sets the color of links in the text.
4293 *
4294 * @see #setLinkTextColor(ColorStateList)
4295 * @see #getLinkTextColors()
4296 *
4297 * @attr ref android.R.styleable#TextView_textColorLink
4298 */
4299 @android.view.RemotableViewMethod
4300 public final void setLinkTextColor(@ColorInt int color) {
4301     mLinkTextColor = ColorStateList.valueOf(color);
4302     updateTextColors();
4303 }
4304
4305 /**
4306 * Sets the color of links in the text.
4307 *
4308 * @see #setLinkTextColor(int)
4309 * @see #getLinkTextColors()
4310 * @see #setTextColor(ColorStateList)
4311 * @see #setHintTextColor(ColorStateList)
4312 *
4313 * @attr ref android.R.styleable#TextView_textColorLink
4314 */
4315 public final void setLinkTextColor(ColorStateList colors) {
4316     mLinkTextColor = colors;
4317     updateTextColors();
4318 }
```

```
4319
4320     /**
4321     * @return the list of colors used to paint the links in the text,
... for the different states of
4322     * this TextView
4323     *
4324     * @see #setLinkTextColor(ColorStateList)
4325     * @see #setLinkTextColor(int)
4326     *
4327     * @attr ref android.R.styleable#TextView_textColorLink
4328     */
4329     public final ColorStateList getLinkTextColors() {
4330         return mLinkTextColor;
4331     }
4332
4333     /**
4334     * Sets the horizontal alignment of the text and the
4335     * vertical gravity that will be used when there is extra space
4336     * in the TextView beyond what is required for the text itself.
4337     *
4338     * @see android.view.Gravity
4339     * @attr ref android.R.styleable#TextView_gravity
4340     */
4341     public void setGravity(int gravity) {
4342         if ((gravity & Gravity.RELATIVE_HORIZONTAL_GRAVITY_MASK) == 0) {
4343             gravity |= Gravity.START;
4344         }
4345         if ((gravity & Gravity.VERTICAL_GRAVITY_MASK) == 0) {
4346             gravity |= Gravity.TOP;
4347         }
4348
4349         boolean newLayout = false;
4350
4351         if ((gravity & Gravity.RELATIVE_HORIZONTAL_GRAVITY_MASK)
4352             != (mGravity &
... Gravity.RELATIVE_HORIZONTAL_GRAVITY_MASK)) {
4353             newLayout = true;
4354         }
4355
4356         if (gravity != mGravity) {
4357             invalidate();
4358         }
4359
4360         mGravity = gravity;
4361
4362         if (mLayout != null && newLayout) {
4363             // XXX this is heavy-handed because no actual content
... changes.
4364             int want = mLayout.getWidth();
4365             int hintWant = mHintLayout == null ? 0 :
```

```
4365... mHintLayout.getWidth();
4366
4367         makeNewLayout(want, hintWant, UNKNOWN_BORING,
... UNKNOWN_BORING,
4368             mRight - mLeft - getCompoundPaddingLeft() -
... getCompoundPaddingRight(), true);
4369     }
4370 }
4371
4372 /**
4373  * Returns the horizontal and vertical alignment of this TextView.
4374  *
4375  * @see android.view.Gravity
4376  * @attr ref android.R.styleable#TextView_gravity
4377  */
4378 public int getGravity() {
4379     return mGravity;
4380 }
4381
4382 /**
4383  * Gets the flags on the Paint being used to display the text.
4384  * @return The flags on the Paint being used to display the text.
4385  * @see Paint#getFlags
4386  */
4387 public int getPaintFlags() {
4388     return mTextPaint.getFlags();
4389 }
4390
4391 /**
4392  * Sets flags on the Paint being used to display the text and
4393  * reflows the text if they are different from the old flags.
4394  * @see Paint#setFlags
4395  */
4396 @android.view.RemotableViewMethod
4397 public void setPaintFlags(int flags) {
4398     if (mTextPaint.getFlags() != flags) {
4399         mTextPaint.setFlags(flags);
4400
4401         if (mLayout != null) {
4402             nullLayouts();
4403             requestLayout();
4404             invalidate();
4405         }
4406     }
4407 }
4408
4409 /**
4410  * Sets whether the text should be allowed to be wider than the
4411  * View is. If false, it will be wrapped to the width of the View.
4412  *
```

```
4413 * @attr ref android.R.styleable#TextView_scrollHorizontally
4414 */
4415 public void setHorizontallyScrolling(boolean whether) {
4416     if (mHorizontallyScrolling != whether) {
4417         mHorizontallyScrolling = whether;
4418
4419         if (mLayout != null) {
4420             nullLayouts();
4421             requestLayout();
4422             invalidate();
4423         }
4424     }
4425 }
4426
4427 /**
4428  * Returns whether the text is allowed to be wider than the View is.
4429  * If false, the text will be wrapped to the width of the View.
4430  *
4431  * @attr ref android.R.styleable#TextView_scrollHorizontally
4432  * @hide
4433  */
4434 public boolean getHorizontallyScrolling() {
4435     return mHorizontallyScrolling;
4436 }
4437
4438 /**
4439  * Sets the height of the TextView to be at least {@code minLines}
4440  * tall.
4441  * <p>
4442  * This value is used for height calculation if LayoutParams does
4443  * not force TextView to have an
4444  * exact height. Setting this value overrides other previous minimum
4445  * height configurations such
4446  * as {@link #setMinHeight(int)} or {@link #setHeight(int)}. {@link
4447  * #setSingleLine()} will set
4448  * this value to 1.
4449  *
4450  * @param minLines the minimum height of TextView in terms of number
4451  * of lines
4452  *
4453  * @see #getMinLines()
4454  * @see #setLines(int)
4455  *
4456  * @attr ref android.R.styleable#TextView_minLines
4457  */
4458 @android.view.RemotableViewMethod
4459 public void setMinLines(int minLines) {
4460     mMinimum = minLines;
4461     mMinMode = LINES;
4462 }
```



```
4458     requestLayout();
4459     invalidate();
4460 }
4461
4462 /**
4463  * Returns the minimum height of TextView in terms of number of
... lines or -1 if the minimum
4464  * height was set using {@link #setMinHeight(int)} or {@link
... #setHeight(int)}.
4465  *
4466  * @return the minimum height of TextView in terms of number of
... lines or -1 if the minimum
4467  *         height is not defined in lines
4468  *
4469  * @see #setMinLines(int)
4470  * @see #setLines(int)
4471  *
4472  * @attr ref android.R.styleable#TextView_minLines
4473  */
4474 public int getMinLines() {
4475     return mMinMode == LINES ? mMinimum : -1;
4476 }
4477
4478 /**
4479  * Sets the height of the TextView to be at least {@code minPixels}
... tall.
4480  * <p>
4481  * This value is used for height calculation if LayoutParams does
... not force TextView to have an
4482  * exact height. Setting this value overrides previous minimum
... height configurations such as
4483  * {@link #setMinLines(int)} or {@link #setLines(int)}.
4484  * <p>
4485  * The value given here is different than {@link
... #setMinimumHeight(int)}. Between
4486  * {@code minHeight} and the value set in {@link
... #setMinimumHeight(int)}, the greater one is
4487  * used to decide the final height.
4488  *
4489  * @param minPixels the minimum height of TextView in terms of
... pixels
4490  *
4491  * @see #getMinHeight()
4492  * @see #setHeight(int)
4493  *
4494  * @attr ref android.R.styleable#TextView_minHeight
4495  */
4496 @android.view.RemotableViewMethod
4497 public void setMinHeight(int minPixels) {
4498     mMinimum = minPixels;
```

```
4499     mMinMode = PIXELS;
4500
4501     requestLayout();
4502     invalidate();
4503 }
4504
4505 /**
4506  * Returns the minimum height of TextView in terms of pixels or -1
... if the minimum height was
4507  * set using {@link #setMinLines(int)} or {@link #setLines(int)}.
4508  *
4509  * @return the minimum height of TextView in terms of pixels or -1
... if the minimum height is not
4510  *     defined in pixels
4511  *
4512  * @see #setMinHeight(int)
4513  * @see #setHeight(int)
4514  *
4515  * @attr ref android.R.styleable#TextView_minHeight
4516  */
4517 public int getMinHeight() {
4518     return mMinMode == PIXELS ? mMinimum : -1;
4519 }
4520
4521 /**
4522  * Sets the height of the TextView to be at most {@code maxLines}
... tall.
4523  * <p>
4524  * This value is used for height calculation if LayoutParams does
... not force TextView to have an
4525  * exact height. Setting this value overrides previous maximum
... height configurations such as
4526  * {@link #setMaxHeight(int)} or {@link #setLines(int)}.
4527  *
4528  * @param maxLines the maximum height of TextView in terms of number
... of lines
4529  *
4530  * @see #getMaxLines()
4531  * @see #setLines(int)
4532  *
4533  * @attr ref android.R.styleable#TextView_maxLines
4534  */
4535 @android.view.RemotableViewMethod
4536 public void setMaxLines(int maxLines) {
4537     mMaximum = maxLines;
4538     mMaxMode = LINES;
4539
4540     requestLayout();
4541     invalidate();
4542 }
```

```
4543
4544     /**
4545      * Returns the maximum height of TextView in terms of number of
... lines or -1 if the
4546      * maximum height was set using {@link #setMaxHeight(int)} or {@link
... #setHeight(int)}.
4547      *
4548      * @return the maximum height of TextView in terms of number of
... lines. -1 if the maximum height
4549      *         is not defined in lines.
4550      *
4551      * @see #setMaxLines(int)
4552      * @see #setLines(int)
4553      *
4554      * @attr ref android.R.styleable#TextView_maxLines
4555      */
4556     public int getMaxLines() {
4557         return mMaxMode == LINES ? mMaximum : -1;
4558     }
4559
4560     /**
4561      * Sets the height of the TextView to be at most {@code maxPixels}
... tall.
4562      * <p>
4563      * This value is used for height calculation if LayoutParams does
... not force TextView to have an
4564      * exact height. Setting this value overrides previous maximum
... height configurations such as
4565      * {@link #setMaxLines(int)} or {@link #setLines(int)}.
4566      *
4567      * @param maxPixels the maximum height of TextView in terms of
... pixels
4568      *
4569      * @see #getMaxHeight()
4570      * @see #setHeight(int)
4571      *
4572      * @attr ref android.R.styleable#TextView_maxHeight
4573      */
4574     @android.view.RemotableViewMethod
4575     public void setMaxHeight(int maxPixels) {
4576         mMaximum = maxPixels;
4577         mMaxMode = PIXELS;
4578
4579         requestLayout();
4580         invalidate();
4581     }
4582
4583     /**
4584      * Returns the maximum height of TextView in terms of pixels or -1
... if the maximum height was
```

```
4585 * set using {@link #setMaxLines(int)} or {@link #setLines(int)}.
4586 *
4587 * @return the maximum height of TextView in terms of pixels or -1
... if the maximum height
4588 *         is not defined in pixels
4589 *
4590 * @see #setMaxHeight(int)
4591 * @see #setHeight(int)
4592 *
4593 * @attr ref android.R.styleable#TextView_maxHeight
4594 */
4595 public int getMaxHeight() {
4596     return mMaxMode == PIXELS ? mMaximum : -1;
4597 }
4598
4599 /**
4600 * Sets the height of the TextView to be exactly {@code lines} tall.
4601 * <p>
4602 * This value is used for height calculation if LayoutParams does
... not force TextView to have an
4603 * exact height. Setting this value overrides previous
... minimum/maximum height configurations
4604 * such as {@link #setMinLines(int)} or {@link #setMaxLines(int)}.
... {@link #setSingleLine()} will
4605 * set this value to 1.
4606 *
4607 * @param lines the exact height of the TextView in terms of lines
4608 *
4609 * @see #setHeight(int)
4610 *
4611 * @attr ref android.R.styleable#TextView_lines
4612 */
4613 @android.view.RemotableViewMethod
4614 public void setLines(int lines) {
4615     mMaximum = mMinimum = lines;
4616     mMaxMode = mMinMode = LINES;
4617
4618     requestLayout();
4619     invalidate();
4620 }
4621
4622 /**
4623 * Sets the height of the TextView to be exactly <code>pixels</code>
... tall.
4624 * <p>
4625 * This value is used for height calculation if LayoutParams does
... not force TextView to have an
4626 * exact height. Setting this value overrides previous
... minimum/maximum height configurations
4627 * such as {@link #setMinHeight(int)} or {@link #setMaxHeight(int)}.
```

```
4628 *
4629 * @param pixels the exact height of the TextView in terms of pixels
4630 *
4631 * @see #setLines(int)
4632 *
4633 * @attr ref android.R.styleable#TextView_height
4634 */
4635 @android.view.RemotableViewMethod
4636 public void setHeight(int pixels) {
4637     mMaximum = mMinimum = pixels;
4638     mMaxMode = mMinMode = PIXELS;
4639
4640     requestLayout();
4641     invalidate();
4642 }
4643
4644 /**
4645 * Sets the width of the TextView to be at least {@code minEms}
... wide.
4646 * <p>
4647 * This value is used for width calculation if LayoutParams does not
... force TextView to have an
4648 * exact width. Setting this value overrides previous minimum width
... configurations such as
4649 * {@link #setMinWidth(int)} or {@link #setWidth(int)}.
4650 *
4651 * @param minEms the minimum width of TextView in terms of ems
4652 *
4653 * @see #getMinEms()
4654 * @see #setEms(int)
4655 *
4656 * @attr ref android.R.styleable#TextView_minEms
4657 */
4658 @android.view.RemotableViewMethod
4659 public void setMinEms(int minEms) {
4660     mMinWidth = minEms;
4661     mMinWidthMode = EMS;
4662
4663     requestLayout();
4664     invalidate();
4665 }
4666
4667 /**
4668 * Returns the minimum width of TextView in terms of ems or -1 if
... the minimum width was set
4669 * using {@link #setMinWidth(int)} or {@link #setWidth(int)}.
4670 *
4671 * @return the minimum width of TextView in terms of ems. -1 if the
... minimum width is not
4672 *         defined in ems
```

```
4673 *
4674 * @see #setMinEms(int)
4675 * @see #setEms(int)
4676 *
4677 * @attr ref android.R.styleable#TextView_minEms
4678 */
4679 public int getMinEms() {
4680     return mMinWidthMode == EMS ? mMinWidth : -1;
4681 }
4682
4683 /**
4684 * Sets the width of the TextView to be at least {@code minPixels}
... wide.
4685 * <p>
4686 * This value is used for width calculation if LayoutParams does not
... force TextView to have an
4687 * exact width. Setting this value overrides previous minimum width
... configurations such as
4688 * {@link #setMinEms(int)} or {@link #setEms(int)}.
4689 * <p>
4690 * The value given here is different than {@link
... #setMinimumWidth(int)}. Between
4691 * {@code minWidth} and the value set in {@link
... #setMinimumWidth(int)}, the greater one is used
4692 * to decide the final width.
4693 *
4694 * @param minPixels the minimum width of TextView in terms of pixels
4695 *
4696 * @see #getMinWidth()
4697 * @see #setWidth(int)
4698 *
4699 * @attr ref android.R.styleable#TextView_minWidth
4700 */
4701 @android.view.RemotableViewMethod
4702 public void setMinWidth(int minPixels) {
4703     mMinWidth = minPixels;
4704     mMinWidthMode = PIXELS;
4705
4706     requestLayout();
4707     invalidate();
4708 }
4709
4710 /**
4711 * Returns the minimum width of TextView in terms of pixels or -1 if
... the minimum width was set
4712 * using {@link #setMinEms(int)} or {@link #setEms(int)}.
4713 *
4714 * @return the minimum width of TextView in terms of pixels or -1 if
... the minimum width is not
4715 *         defined in pixels
```

```
4716 *
4717 * @see #setMinWidth(int)
4718 * @see #setWidth(int)
4719 *
4720 * @attr ref android.R.styleable#TextView_minWidth
4721 */
4722 public int getMinWidth() {
4723     return minWidthMode == PIXELS ? minWidth : -1;
4724 }
4725
4726 /**
4727 * Sets the width of the TextView to be at most {@code maxEms} wide.
4728 * <p>
4729 * This value is used for width calculation if LayoutParams does not
... force TextView to have an
4730 * exact width. Setting this value overrides previous maximum width
... configurations such as
4731 * {@link #setMaxWidth(int)} or {@link #setWidth(int)}.
4732 *
4733 * @param maxEms the maximum width of TextView in terms of ems
4734 *
4735 * @see #getMaxEms()
4736 * @see #setEms(int)
4737 *
4738 * @attr ref android.R.styleable#TextView_maxEms
4739 */
4740 @android.view.RemotableViewMethod
4741 public void setMaxEms(int maxEms) {
4742     maxWidth = maxEms;
4743     maxWidthMode = EMS;
4744
4745     requestLayout();
4746     invalidate();
4747 }
4748
4749 /**
4750 * Returns the maximum width of TextView in terms of ems or -1 if
... the maximum width was set
4751 * using {@link #setMaxWidth(int)} or {@link #setWidth(int)}.
4752 *
4753 * @return the maximum width of TextView in terms of ems or -1 if
... the maximum width is not
4754 *         defined in ems
4755 *
4756 * @see #setMaxEms(int)
4757 * @see #setEms(int)
4758 *
4759 * @attr ref android.R.styleable#TextView_maxEms
4760 */
4761 public int getMaxEms() {
```



```
4762     return mMaxWidthMode == EMS ? mMaxWidth : -1;
4763 }
4764
4765 /**
4766  * Sets the width of the TextView to be at most {@code maxPixels}
... wide.
4767  * <p>
4768  * This value is used for width calculation if LayoutParams does not
... force TextView to have an
4769  * exact width. Setting this value overrides previous maximum width
... configurations such as
4770  * {@link #setMaxEms(int)} or {@link #setEms(int)}.
4771  *
4772  * @param maxPixels the maximum width of TextView in terms of pixels
4773  *
4774  * @see #getMaxWidth()
4775  * @see #setWidth(int)
4776  *
4777  * @attr ref android.R.styleable#TextView_maxWidth
4778  */
4779 @android.view.RemotableViewMethod
4780 public void setMaxWidth(int maxPixels) {
4781     mMaxWidth = maxPixels;
4782     mMaxWidthMode = PIXELS;
4783
4784     requestLayout();
4785     invalidate();
4786 }
4787
4788 /**
4789  * Returns the maximum width of TextView in terms of pixels or -1 if
... the maximum width was set
4790  * using {@link #setMaxEms(int)} or {@link #setEms(int)}.
4791  *
4792  * @return the maximum width of TextView in terms of pixels. -1 if
... the maximum width is not
4793  *         defined in pixels
4794  *
4795  * @see #setMaxWidth(int)
4796  * @see #setWidth(int)
4797  *
4798  * @attr ref android.R.styleable#TextView_maxWidth
4799  */
4800 public int getMaxWidth() {
4801     return mMaxWidthMode == PIXELS ? mMaxWidth : -1;
4802 }
4803
4804 /**
4805  * Sets the width of the TextView to be exactly {@code ems} wide.
4806  *
```

```
4807 * This value is used for width calculation if LayoutParams does not
... force TextView to have an
4808 * exact width. Setting this value overrides previous
... minimum/maximum configurations such as
4809 * {@link #setMinEms(int)} or {@link #setMaxEms(int)}.
4810 *
4811 * @param ems the exact width of the TextView in terms of ems
4812 *
4813 * @see #setWidth(int)
4814 *
4815 * @attr ref android.R.styleable#TextView_ems
4816 */
4817 @android.view.RemotableViewMethod
4818 public void setEms(int ems) {
4819     mMaxWidth = mMinWidth = ems;
4820     mMaxWidthMode = mMinWidthMode = EMS;
4821
4822     requestLayout();
4823     invalidate();
4824 }
4825
4826 /**
4827 * Sets the width of the TextView to be exactly {@code pixels} wide.
4828 * <p>
4829 * This value is used for width calculation if LayoutParams does not
... force TextView to have an
4830 * exact width. Setting this value overrides previous
... minimum/maximum width configurations
4831 * such as {@link #setMinWidth(int)} or {@link #setMaxWidth(int)}.
4832 *
4833 * @param pixels the exact width of the TextView in terms of pixels
4834 *
4835 * @see #setEms(int)
4836 *
4837 * @attr ref android.R.styleable#TextView_width
4838 */
4839 @android.view.RemotableViewMethod
4840 public void setWidth(int pixels) {
4841     mMaxWidth = mMinWidth = pixels;
4842     mMaxWidthMode = mMinWidthMode = PIXELS;
4843
4844     requestLayout();
4845     invalidate();
4846 }
4847
4848 /**
4849 * Sets line spacing for this TextView. Each line will have its
... height
4850 * multiplied by <code>mult</code> and have <code>add</code> added
... to it.
```

```
4851 *
4852 * @attr ref android.R.styleable#TextView_lineSpacingExtra
4853 * @attr ref android.R.styleable#TextView_lineSpacingMultiplier
4854 */
4855 public void setLineSpacing(float add, float mult) {
4856     if (mSpacingAdd != add || mSpacingMult != mult) {
4857         mSpacingAdd = add;
4858         mSpacingMult = mult;
4859
4860         if (mLayout != null) {
4861             nullLayouts();
4862             requestLayout();
4863             invalidate();
4864         }
4865     }
4866 }
4867
4868 /**
4869  * Gets the line spacing multiplier
4870  *
4871  * @return the value by which each line's height is multiplied to
... get its actual height.
4872  *
4873  * @see #setLineSpacing(float, float)
4874  * @see #getLineSpacingExtra()
4875  *
4876  * @attr ref android.R.styleable#TextView_lineSpacingMultiplier
4877  */
4878 public float getLineSpacingMultiplier() {
4879     return mSpacingMult;
4880 }
4881
4882 /**
4883  * Gets the line spacing extra space
4884  *
4885  * @return the extra space that is added to the height of each lines
... of this TextView.
4886  *
4887  * @see #setLineSpacing(float, float)
4888  * @see #getLineSpacingMultiplier()
4889  *
4890  * @attr ref android.R.styleable#TextView_lineSpacingExtra
4891  */
4892 public float getLineSpacingExtra() {
4893     return mSpacingAdd;
4894 }
4895
4896 /**
4897  * Convenience method to append the specified text to the TextView's
4898  * display buffer, upgrading it to {@link
```

```
4898... android.widget.TextView.BufferType#EDITABLE}
4899     * if it was not already editable.
4900     *
4901     * @param text text to be appended to the already displayed text
4902     */
4903     public final void append(CharSequence text) {
4904         append(text, 0, text.length());
4905     }
4906
4907     /**
4908     * Convenience method to append the specified text slice to the
... TextView's
4909     * display buffer, upgrading it to {@link
... android.widget.TextView.BufferType#EDITABLE}
4910     * if it was not already editable.
4911     *
4912     * @param text text to be appended to the already displayed text
4913     * @param start the index of the first character in the {@code text}
4914     * @param end the index of the character following the last
... character in the {@code text}
4915     *
4916     * @see Appendable#append(CharSequence, int, int)
4917     */
4918     public void append(CharSequence text, int start, int end) {
4919         if (!(mText instanceof Editable)) {
4920             setText(mText, BufferType.EDITABLE);
4921         }
4922
4923         ((Editable) mText).append(text, start, end);
4924
4925         if (mAutoLinkMask != 0) {
4926             boolean linksWereAdded = Linkify.addLinks((Spannable) mText,
... mAutoLinkMask);
4927             // Do not change the movement method for text that support
... text selection as it
4928             // would prevent an arbitrary cursor displacement.
4929             if (linksWereAdded && mLinksClickable &&
... !textCanBeSelected()) {
4930                 setMovementMethod(LinkMovementMethod.getInstance());
4931             }
4932         }
4933     }
4934
4935     private void updateTextColors() {
4936         boolean inval = false;
4937         int color = mTextColor.getColorForState(getDrawableState(), 0);
4938         if (color != mCurTextColor) {
4939             mCurTextColor = color;
4940             inval = true;
4941         }

```

```
4942     if (mLinkTextColor != null) {
4943         color = mLinkTextColor.getColorForState(getDrawableState(),
... 0);
4944         if (color != mTextPaint.linkColor) {
4945             mTextPaint.linkColor = color;
4946             inval = true;
4947         }
4948     }
4949     if (mHintTextColor != null) {
4950         color = mHintTextColor.getColorForState(getDrawableState(),
... 0);
4951         if (color != mCurHintTextColor) {
4952             mCurHintTextColor = color;
4953             if (mText.length() == 0) {
4954                 inval = true;
4955             }
4956         }
4957     }
4958     if (inval) {
4959         // Text needs to be redrawn with the new color
4960         if (mEditor != null) mEditor.invalidateTextDisplayList();
4961         invalidate();
4962     }
4963 }
4964
4965 @Override
4966 protected void drawableStateChanged() {
4967     super.drawableStateChanged();
4968
4969     if (mTextColor != null && mTextColor.isStateful()
4970         || (mHintTextColor != null &&
... mHintTextColor.isStateful())
4971         || (mLinkTextColor != null &&
... mLinkTextColor.isStateful())) {
4972         updateTextColors();
4973     }
4974
4975     if (mDrawables != null) {
4976         final int[] state = getDrawableState();
4977         for (Drawable dr : mDrawables.mShowing) {
4978             if (dr != null && dr.isStateful() && dr.setState(state))
... {
4979                 invalidateDrawable(dr);
4980             }
4981         }
4982     }
4983 }
4984
4985 @Override
4986 public void drawableHotspotChanged(float x, float y) {
```

```
4987     super.drawableHotspotChanged(x, y);
4988
4989     if (mDrawables != null) {
4990         for (Drawable dr : mDrawables.mShowing) {
4991             if (dr != null) {
4992                 dr.setHotspot(x, y);
4993             }
4994         }
4995     }
4996 }
4997
4998 @Override
4999 public Parcelable onSaveInstanceState() {
5000     Parcelable superState = super.onSaveInstanceState();
5001
5002     // Save state if we are forced to
5003     final boolean freezesText = getFreezesText();
5004     boolean hasSelection = false;
5005     int start = -1;
5006     int end = -1;
5007
5008     if (mText != null) {
5009         start = getSelectionStart();
5010         end = getSelectionEnd();
5011         if (start >= 0 || end >= 0) {
5012             // Or save state if there is a selection
5013             hasSelection = true;
5014         }
5015     }
5016
5017     if (freezesText || hasSelection) {
5018         SavedState ss = new SavedState(superState);
5019
5020         if (freezesText) {
5021             if (mText instanceof Spanned) {
5022                 final Spannable sp = new
5023 ... SpannableStringBuilder(mText);
5024
5025                 if (mEditor != null) {
5026                     removeMisspelledSpans(sp);
5027                     sp.removeSpan(mEditor.mSuggestionRangeSpan);
5028                 }
5029
5030                 ss.text = sp;
5031             } else {
5032                 ss.text = mText.toString();
5033             }
5034
5035             if (hasSelection) {
```

```
5036 // XXX should also save the current scroll position!
5037     ss.selStart = start;
5038     ss.selEnd = end;
5039 }
5040
5041     if (isFocused() && start >= 0 && end >= 0) {
5042         ss.frozenWithFocus = true;
5043     }
5044
5045     ss.error = getError();
5046
5047     if (mEditor != null) {
5048         ss.editorState = mEditor.saveInstanceState();
5049     }
5050     return ss;
5051 }
5052
5053     return superState;
5054 }
5055
5056     void removeMisspelledSpans(Spannable spannable) {
5057         SuggestionSpan[] suggestionSpans = spannable.getSpans(0,
5058 ... spannable.length(),
5059             SuggestionSpan.class);
5060         for (int i = 0; i < suggestionSpans.length; i++) {
5061             int flags = suggestionSpans[i].getFlags();
5062             if ((flags & SuggestionSpan.FLAG_EASY_CORRECT) != 0
5063                 && (flags & SuggestionSpan.FLAG_MISSPELLED) != 0) {
5064                 spannable.removeSpan(suggestionSpans[i]);
5065             }
5066         }
5067     }
5068
5069     @Override
5070     public void onRestoreInstanceState(Parcelable state) {
5071         if (!(state instanceof SavedState)) {
5072             super.onRestoreInstanceState(state);
5073             return;
5074         }
5075         SavedState ss = (SavedState) state;
5076         super.onRestoreInstanceState(ss.getSuperState());
5077
5078         // XXX restore buffer type too, as well as lots of other stuff
5079         if (ss.text != null) {
5080             setText(ss.text);
5081         }
5082
5083         if (ss.selStart >= 0 && ss.selEnd >= 0) {
5084             if (mText instanceof Spannable) {
```



```
5085     int len = mText.length();
5086
5087     if (ss.selStart > len || ss.selEnd > len) {
5088         String restored = "";
5089
5090         if (ss.text != null) {
5091             restored = "(restored) ";
5092         }
5093
5094         Log.e(LOG_TAG, "Saved cursor position " +
5095 ... ss.selStart + "/" + ss.selEnd
5096 ...         + " out of range for " + restored + "text "
5097 ... + mText);
5098     } else {
5099         Selection.setSelection((Spannable) mText,
5100 ... ss.selStart, ss.selEnd);
5101
5102         if (ss.frozenWithFocus) {
5103             createEditorIfNeeded();
5104             mEditor.mFrozenWithFocus = true;
5105         }
5106     }
5107 }
5108
5109 if (ss.error != null) {
5110     final CharSequence error = ss.error;
5111     // Display the error later, after the first layout pass
5112     post(new Runnable() {
5113         public void run() {
5114             if (mEditor == null || !mEditor.mErrorWasChanged) {
5115                 setError(error);
5116             }
5117         }
5118     });
5119 }
5120
5121 if (ss.editorState != null) {
5122     createEditorIfNeeded();
5123     mEditor.restoreInstanceState(ss.editorState);
5124 }
5125
5126 /**
5127 * Control whether this text view saves its entire text contents
5128 ... when
5129 * freezing to an icicle, in addition to dynamic state such as
5130 ... cursor
5131 * position. By default this is false, not saving the text. Set to
5132 ... true
```

```

5129 * if the text in the text view is not being saved somewhere else in
5130 * persistent storage (such as in a content provider) so that if the
5131 * view is later thawed the user will not lose their data. For
5132 * {@link android.widget.EditText} it is always enabled, regardless
... of
5133 * the value of the attribute.
5134 *
5135 * @param freezesText Controls whether a frozen icicle should
... include the
5136 * entire text data: true to include it, false to not.
5137 *
5138 * @attr ref android.R.styleable#TextView_freezesText
5139 */
5140 @android.view.RemotableViewMethod
5141 public void setFreezesText(boolean freezesText) {
5142     mFreezesText = freezesText;
5143 }
5144
5145 /**
5146 * Return whether this text view is including its entire text
... contents
5147 * in frozen icicles. For {@link android.widget.EditText} it always
... returns true.
5148 *
5149 * @return Returns true if text is included, false if it isn't.
5150 *
5151 * @see #setFreezesText
5152 */
5153 public boolean getFreezesText() {
5154     return mFreezesText;
5155 }
5156
5157
... //////////////////////////////////////
... ///
5158
5159 /**
5160 * Sets the Factory used to create new {@link Editable Editables}.
5161 *
5162 * @param factory {@link android.text.Editable.Factory
... Editable.Factory} to be used
5163 *
5164 * @see android.text.Editable.Factory
5165 * @see android.widget.TextView.BufferType#EDITABLE
5166 */
5167 public final void setEditableFactory(Editable.Factory factory) {
5168     mEditableFactory = factory;
5169     setText(mText);
5170 }
5171

```

```
5172     /**
5173     * Sets the Factory used to create new {@link Spannable Spannables}.
5174     *
5175     * @param factory {@link android.text.Spannable.Factory
... Spannable.Factory} to be used
5176     *
5177     * @see android.text.Spannable.Factory
5178     * @see android.widget.TextView.BufferType#SPANNABLE
5179     */
5180     public final void setSpannableFactory(Spannable.Factory factory) {
5181         mSpannableFactory = factory;
5182         setText(mText);
5183     }
5184
5185     /**
5186     * Sets the text to be displayed. TextView <em>does not</em> accept
5187     * HTML-like formatting, which you can do with text strings in XML
... resource files.
5188     * To style your strings, attach android.text.style.* objects to a
5189     * {@link android.text.SpannableString}, or see the
5190     * <a
... href="{@docRoot}guide/topics/resources/available-resources.html#
... stringresources">
5191     * Available Resource Types</a> documentation for an example of
... setting
5192     * formatted text in the XML resource file.
5193     * <p/>
5194     * When required, TextView will use {@link
... android.text.Spannable.Factory} to create final or
5195     * intermediate {@link Spannable Spannables}. Likewise it will use
5196     * {@link android.text.Editable.Factory} to create final or
... intermediate
5197     * {@link Editable Editables}.
5198     *
5199     * @param text text to be displayed
5200     *
5201     * @attr ref android.R.styleable#TextView_text
5202     */
5203     @android.view.RemotableViewMethod
5204     public final void setText(CharSequence text) {
5205         setText(text, mBufferType);
5206     }
5207
5208     /**
5209     * Sets the text to be displayed but retains the cursor position.
... Same as
5210     * {@link #setText(CharSequence)} except that the cursor position
... (if any) is retained in the
5211     * new text.
5212     * <p/>
```

```
5213 * When required, TextView will use {@link
... android.text.Spannable.Factory} to create final or
5214 * intermediate {@link Spannable Spannables}. Likewise it will use
5215 * {@link android.text.Editable.Factory} to create final or
... intermediate
5216 * {@link Editable Editables}.
5217 *
5218 * @param text text to be displayed
5219 *
5220 * @see #setText(CharSequence)
5221 */
5222 @android.view.RemotableViewMethod
5223 public final void setTextKeepState(CharSequence text) {
5224     setTextKeepState(text, mBufferType);
5225 }
5226
5227 /**
5228 * Sets the text to be displayed and the {@link
... android.widget.TextView.BufferType}.
5229 * <p/>
5230 * When required, TextView will use {@link
... android.text.Spannable.Factory} to create final or
5231 * intermediate {@link Spannable Spannables}. Likewise it will use
5232 * {@link android.text.Editable.Factory} to create final or
... intermediate
5233 * {@link Editable Editables}.
5234 *
5235 * @param text text to be displayed
5236 * @param type a {@link android.widget.TextView.BufferType} which
... defines whether the text is
5237 *         stored as a static text, styleable/spannable text,
... or editable text
5238 *
5239 * @see #setText(CharSequence)
5240 * @see android.widget.TextView.BufferType
5241 * @see #setSpannableFactory(Spannable.Factory)
5242 * @see #setEditableFactory(Editable.Factory)
5243 *
5244 * @attr ref android.R.styleable#TextView_text
5245 * @attr ref android.R.styleable#TextView_bufferType
5246 */
5247 public void setText(CharSequence text, BufferType type) {
5248     setText(text, type, true, 0);
5249
5250     if (mCharWrapper != null) {
5251         mCharWrapper.mChars = null;
5252     }
5253 }
5254
5255 private void setText(CharSequence text, BufferType type,
```

```
5256         boolean notifyBefore, int oldlen) {
5257         mTextFromResource = false;
5258         if (text == null) {
5259             text = "";
5260         }
5261
5262         // If suggestions are not enabled, remove the suggestion spans
... from the text
5263         if (!isSuggestionsEnabled()) {
5264             text = removeSuggestionSpans(text);
5265         }
5266
5267         if (!mUserSetTextScaleX) mTextPaint.setTextScaleX(1.0f);
5268
5269         if (text instanceof Spanned
5270             && ((Spanned)
... text).getSpanStart(TextUtils.TruncateAt.MARQUEE) >= 0) {
5271             if
... (ViewConfiguration.get(mContext).isFadingMarqueeEnabled()) {
5272                 setHorizontalFadingEdgeEnabled(true);
5273                 mMarqueeFadeMode = MARQUEE_FADE_NORMAL;
5274             } else {
5275                 setHorizontalFadingEdgeEnabled(false);
5276                 mMarqueeFadeMode = MARQUEE_FADE_SWITCH_SHOW_ELLIPSIS;
5277             }
5278             setEllipsize(TextUtils.TruncateAt.MARQUEE);
5279         }
5280
5281         int n = mFilters.length;
5282         for (int i = 0; i < n; i++) {
5283             CharSequence out = mFilters[i].filter(text, 0,
... text.length(), EMPTY_SPANNED, 0, 0);
5284             if (out != null) {
5285                 text = out;
5286             }
5287         }
5288
5289         if (notifyBefore) {
5290             if (mText != null) {
5291                 oldlen = mText.length();
5292                 sendBeforeTextChanged(mText, 0, oldlen, text.length());
5293             } else {
5294                 sendBeforeTextChanged("", 0, 0, text.length());
5295             }
5296         }
5297
5298         boolean needEditableForNotification = false;
5299
5300         if (mListeners != null && mListeners.size() != 0) {
5301             needEditableForNotification = true;
```

```
5302 }
5303
5304     if (type == BufferType.EDITABLE || getKeyListener() != null
5305         || needEditableForNotification) {
5306         createEditorIfNeeded();
5307         mEditor.forgetUndoRedo();
5308         Editable t = mEditableFactory.newEditable(text);
5309         text = t;
5310         setFilters(t, mFilters);
5311         InputMethodManager imm = InputMethodManager.peekInstance();
5312         if (imm != null) imm.restartInput(this);
5313     } else if (type == BufferType.SPANNABLE || mMovement != null) {
5314         text = mSpannableFactory.newSpannable(text);
5315     } else if (!(text instanceof CharWrapper)) {
5316         text = TextUtils.stringOrSpannedString(text);
5317     }
5318
5319     if (mAutoLinkMask != 0) {
5320         Spannable s2;
5321
5322         if (type == BufferType.EDITABLE || text instanceof
5323 ... Spannable) {
5324             s2 = (Spannable) text;
5325         } else {
5326             s2 = mSpannableFactory.newSpannable(text);
5327         }
5328
5329         if (Linkify.addLinks(s2, mAutoLinkMask)) {
5330             text = s2;
5331             type = (type == BufferType.EDITABLE) ?
5332 ... BufferType.EDITABLE : BufferType.SPANNABLE;
5333
5334             /*
5335             * We must go ahead and set the text before changing the
5336             * movement method, because setMovementMethod() may call
5337             * setText() again to try to upgrade the buffer type.
5338             */
5339             mText = text;
5340
5341             // Do not change the movement method for text that
5342 ... support text selection as it
5343             // would prevent an arbitrary cursor displacement.
5344             if (mLinksClickable && !textCanBeSelected()) {
5345                 setMovementMethod(LinkMovementMethod.getInstance());
5346             }
5347         }
5348     }
5349
5350     mBufferType = type;
5351     mText = text;
```

```
5349
5350     if (mTransformation == null) {
5351         mTransformed = text;
5352     } else {
5353         mTransformed = mTransformation.getTransformation(text,
... this);
5354     }
5355
5356     final int textLength = text.length();
5357
5358     if (text instanceof Spannable &&
... !mAllowTransformationLengthChange) {
5359         Spannable sp = (Spannable) text;
5360
5361         // Remove any ChangeWatchers that might have come from other
... TextViews.
5362         final ChangeWatcher[] watchers = sp.getSpans(0, sp.length(),
... ChangeWatcher.class);
5363         final int count = watchers.length;
5364         for (int i = 0; i < count; i++) {
5365             sp.removeSpan(watchers[i]);
5366         }
5367
5368         if (mChangeWatcher == null) mChangeWatcher = new
... ChangeWatcher();
5369
5370         sp.setSpan(mChangeWatcher, 0, textLength,
... Spanned.SPAN_INCLUSIVE_INCLUSIVE
5371             | (CHANGE_WATCHER_PRIORITY <<
... Spanned.SPAN_PRIORITY_SHIFT));
5372
5373         if (mEditor != null) mEditor.addSpanWatchers(sp);
5374
5375         if (mTransformation != null) {
5376             sp.setSpan(mTransformation, 0, textLength,
... Spanned.SPAN_INCLUSIVE_INCLUSIVE);
5377         }
5378
5379         if (mMovement != null) {
5380             mMovement.initialize(this, (Spannable) text);
5381
5382             /*
5383              * Initializing the movement method will have set the
5384              * selection, so reset mSelectionMoved to keep that from
5385              * interfering with the normal on-focus
... selection-setting.
5386              */
5387             if (mEditor != null) mEditor.mSelectionMoved = false;
5388         }
5389     }
```

```
5390
5391     if (mLayout != null) {
5392         checkForRelayout();
5393     }
5394
5395     sendOnTextChanged(text, 0, oldlen, textLength);
5396     onTextChanged(text, 0, oldlen, textLength);
5397
5398     ... notifyViewAccessibilityStateChangedIfNeeded(AccessibilityEvent.
5399     ... CONTENT_CHANGE_TYPE_TEXT);
5400
5401     if (needEditableForNotification) {
5402         sendAfterTextChanged((Editable) text);
5403     } else {
5404         // Always notify AutoFillManager - it will return right away
5405         if autofill is disabled.
5406         notifyAutoFillManagerAfterTextChangedIfNeeded();
5407     }
5408
5409     // SelectionModifierCursorController depends on
5410     textCanBeSelected, which depends on text
5411     if (mEditor != null) mEditor.prepareCursorControllers();
5412 }
5413
5414 /**
5415  * Sets the TextView to display the specified slice of the specified
5416  * char array. You must promise that you will not change the
5417  * contents
5418  * of the array except for right before another call to setText(),
5419  * since the TextView has no way to know that the text
5420  * has changed and that it needs to invalidate and re-layout.
5421  *
5422  * @param text char array to be displayed
5423  * @param start start index in the char array
5424  * @param len length of char count after {@code start}
5425  */
5426 public final void setText(char[] text, int start, int len) {
5427     int oldlen = 0;
5428
5429     if (start < 0 || len < 0 || start + len > text.length) {
5430         throw new IndexOutOfBoundsException(start + ", " + len);
5431     }
5432
5433     /**
5434      * We must do the before-notification here ourselves because if
5435      * the old text is a CharWrapper we destroy it before calling
5436      * into the normal path.
5437      */
5438     if (mText != null) {
```



```
5435         oldlen = mText.length();
5436         sendBeforeTextChanged(mText, 0, oldlen, len);
5437     } else {
5438         sendBeforeTextChanged("", 0, 0, len);
5439     }
5440
5441     if (mCharWrapper == null) {
5442         mCharWrapper = new CharWrapper(text, start, len);
5443     } else {
5444         mCharWrapper.set(text, start, len);
5445     }
5446
5447     setText(mCharWrapper, mBufferType, false, oldlen);
5448 }
5449
5450 /**
5451  * Sets the text to be displayed and the {@link
... android.widget.TextView.BufferType} but retains
5452  * the cursor position. Same as
5453  * {@link #setText(CharSequence,
... android.widget.TextView.BufferType)} except that the cursor
5454  * position (if any) is retained in the new text.
5455  * <p/>
5456  * When required, TextView will use {@link
... android.text.Spannable.Factory} to create final or
5457  * intermediate {@link Spannable Spannables}. Likewise it will use
5458  * {@link android.text.Editable.Factory} to create final or
... intermediate
5459  * {@link Editable Editables}.
5460  *
5461  * @param text text to be displayed
5462  * @param type a {@link android.widget.TextView.BufferType} which
... defines whether the text is
5463  *         stored as a static text, styleable/spannable text,
... or editable text
5464  *
5465  * @see #setText(CharSequence, android.widget.TextView.BufferType)
5466  */
5467 public final void setTextKeepState(CharSequence text, BufferType
... type) {
5468     int start = getSelectionStart();
5469     int end = getSelectionEnd();
5470     int len = text.length();
5471
5472     setText(text, type);
5473
5474     if (start >= 0 || end >= 0) {
5475         if (mText instanceof Spannable) {
5476             Selection.setSelection((Spannable) mText,
5477                 Math.max(0, Math.min(start,
```

```

5477... (len)),
5478                                     Math.max(0, Math.min(end, len)));
5479     }
5480 }
5481 }
5482
5483 /**
5484  * Sets the text to be displayed using a string resource identifier.
5485  *
5486  * @param resid the resource identifier of the string resource to be
... displayed
5487  *
5488  * @see #setText(CharSequence)
5489  *
5490  * @attr ref android.R.styleable#TextView_text
5491  */
5492 @android.view.RemotableViewMethod
5493 public final void setText(@StringRes int resid) {
5494     setText(getContext().getResources().getText(resid));
5495     mTextFromResource = true;
5496 }
5497
5498 /**
5499  * Sets the text to be displayed using a string resource identifier
... and the
5500  * {@link android.widget.TextView.BufferType}.
5501  * <p/>
5502  * When required, TextView will use {@link
... android.text.Spannable.Factory} to create final or
5503  * intermediate {@link Spannable Spannables}. Likewise it will use
5504  * {@link android.text.Editable.Factory} to create final or
... intermediate
5505  * {@link Editable Editables}.
5506  *
5507  * @param resid the resource identifier of the string resource to be
... displayed
5508  * @param type a {@link android.widget.TextView.BufferType} which
... defines whether the text is
5509  *         stored as a static text, styleable/spannable text,
... or editable text
5510  *
5511  * @see #setText(int)
5512  * @see #setText(CharSequence)
5513  * @see android.widget.TextView.BufferType
5514  * @see #setSpannableFactory(Spannable.Factory)
5515  * @see #setEditableFactory(Editable.Factory)
5516  *
5517  * @attr ref android.R.styleable#TextView_text
5518  * @attr ref android.R.styleable#TextView_bufferType
5519  */

```

```
5520 public final void setText(@StringRes int resid, BufferType type) {
5521     setText(getContext().getResources().getText(resid), type);
5522     mTextFromResource = true;
5523 }
5524
5525 /**
5526  * Sets the text to be displayed when the text of the TextView is
... empty.
5527  * Null means to use the normal empty text. The hint does not
... currently
5528  * participate in determining the size of the view.
5529  *
5530  * @attr ref android.R.styleable#TextView_hint
5531  */
5532 @android.view.RemotableViewMethod
5533 public final void setHint(CharSequence hint) {
5534     mHint = TextUtils.stringOrSpannedString(hint);
5535
5536     if (mLayout != null) {
5537         checkForRelayout();
5538     }
5539
5540     if (mText.length() == 0) {
5541         invalidate();
5542     }
5543
5544     // Invalidate display list if hint is currently used
5545     if (mEditor != null && mText.length() == 0 && mHint != null) {
5546         mEditor.invalidateTextDisplayList();
5547     }
5548 }
5549
5550 /**
5551  * Sets the text to be displayed when the text of the TextView is
... empty,
5552  * from a resource.
5553  *
5554  * @attr ref android.R.styleable#TextView_hint
5555  */
5556 @android.view.RemotableViewMethod
5557 public final void setHint(@StringRes int resid) {
5558     setHint(getContext().getResources().getText(resid));
5559 }
5560
5561 /**
5562  * Returns the hint that is displayed when the text of the TextView
5563  * is empty.
5564  *
5565  * @attr ref android.R.styleable#TextView_hint
5566  */
```

```
5567 @ViewDebug.CapturedViewProperty
5568 public CharSequence getHint() {
5569     return mHint;
5570 }
5571
5572 boolean isSingleLine() {
5573     return mSingleLine;
5574 }
5575
5576 private static boolean isMultilineInputType(int type) {
5577     return (type & (EditorInfo.TYPE_MASK_CLASS |
... EditorInfo.TYPE_TEXT_FLAG_MULTI_LINE))
5578         == (EditorInfo.TYPE_CLASS_TEXT |
... EditorInfo.TYPE_TEXT_FLAG_MULTI_LINE);
5579 }
5580
5581 /**
5582  * Removes the suggestion spans.
5583  */
5584 CharSequence removeSuggestionSpans(CharSequence text) {
5585     if (text instanceof Spanned) {
5586         Spannable spannable;
5587         if (text instanceof Spannable) {
5588             spannable = (Spannable) text;
5589         } else {
5590             spannable = mSpannableFactory.newSpannable(text);
5591             text = spannable;
5592         }
5593
5594         SuggestionSpan[] spans = spannable.getSpans(0,
... text.length(), SuggestionSpan.class);
5595         for (int i = 0; i < spans.length; i++) {
5596             spannable.removeSpan(spans[i]);
5597         }
5598     }
5599     return text;
5600 }
5601
5602 /**
5603  * Set the type of the content with a constant as defined for {@link
... EditorInfo#inputType}. This
5604  * will take care of changing the key listener, by calling {@link
... #setKeyListener(KeyListener)},
5605  * to match the given content type. If the given content type is
... {@link EditorInfo#TYPE_NULL}
5606  * then a soft keyboard will not be displayed for this text view.
5607  *
5608  * Note that the maximum number of displayed lines (see {@link
... #setMaxLines(int)}) will be
5609  * modified if you change the {@link
```

```

5609... EditorInfo#TYPE_TEXT_FLAG_MULTI_LINE} Flag of the input
5610     * type.
5611     *
5612     * @see #getInputType()
5613     * @see #setRawInputType(int)
5614     * @see android.text.InputType
5615     * @attr ref android.R.styleable#TextView_inputType
5616     */
5617     public void setInputType(int type) {
5618         final boolean wasPassword = isPasswordInputType(getInputType());
5619         final boolean wasVisiblePassword =
... isVisiblePasswordInputType(getInputType());
5620         setInputType(type, false);
5621         final boolean isPassword = isPasswordInputType(type);
5622         final boolean isVisiblePassword =
... isVisiblePasswordInputType(type);
5623         boolean forceUpdate = false;
5624         if (isPassword) {
5625
... setTransformationMethod(PasswordTransformationMethod.getInstance());
5626             setTypefaceFromAttrs(null/* fontTypeface */, null /*
... fontFamily */, MONOSPACE, 0);
5627         } else if (isVisiblePassword) {
5628             if (mTransformation ==
... PasswordTransformationMethod.getInstance()) {
5629                 forceUpdate = true;
5630             }
5631             setTypefaceFromAttrs(null/* fontTypeface */, null /*
... fontFamily */, MONOSPACE, 0);
5632         } else if (wasPassword || wasVisiblePassword) {
5633             // not in password mode, clean up typeface and
... transformation
5634             setTypefaceFromAttrs(null/* fontTypeface */, null /*
... fontFamily */, -1, -1);
5635             if (mTransformation ==
... PasswordTransformationMethod.getInstance()) {
5636                 forceUpdate = true;
5637             }
5638         }
5639
5640         boolean singleLine = !isMultilineInputType(type);
5641
5642         // We need to update the single line mode if it has changed or
... we
5643         // were previously in password mode.
5644         if (mSingleLine != singleLine || forceUpdate) {
5645             // Change single line mode, but only change the
... transformation if
5646             // we are not in password mode.
5647             applySingleLine(singleLine, !isPassword, true);

```

```
5648     }
5649
5650     if (!isSuggestionsEnabled()) {
5651         mText = removeSuggestionSpans(mText);
5652     }
5653
5654     InputMethodManager imm = InputMethodManager.peekInstance();
5655     if (imm != null) imm.restartInput(this);
5656 }
5657
5658 /**
5659  * It would be better to rely on the input type for everything. A
... password inputType should have
5660  * a password transformation. We should hence use
... isPasswordInputType instead of this method.
5661  *
5662  * We should:
5663  * - Call setInputType in setKeyListener instead of changing the
... input type directly (which
5664  * would install the correct transformation).
5665  * - Refuse the installation of a non-password transformation in
... setTransformation if the input
5666  * type is password.
5667  *
5668  * However, this is like this for legacy reasons and we cannot break
... existing apps. This method
5669  * is useful since it matches what the user can see (obfuscated text
... or not).
5670  *
5671  * @return true if the current transformation method is of the
... password type.
5672  */
5673 boolean hasPasswordTransformationMethod() {
5674     return mTransformation instanceof PasswordTransformationMethod;
5675 }
5676
5677 private static boolean isPasswordInputType(int inputType) {
5678     final int variation =
5679         inputType & (EditorInfo.TYPE_MASK_CLASS |
... EditorInfo.TYPE_MASK_VARIATION);
5680     return variation
5681         == (EditorInfo.TYPE_CLASS_TEXT |
... EditorInfo.TYPE_TEXT_VARIATION_PASSWORD)
5682         || variation
5683         == (EditorInfo.TYPE_CLASS_TEXT |
... EditorInfo.TYPE_TEXT_VARIATION_WEB_PASSWORD)
5684         || variation
5685         == (EditorInfo.TYPE_CLASS_NUMBER |
... EditorInfo.TYPE_NUMBER_VARIATION_PASSWORD);
5686 }
```

```
5687
5688     private static boolean isVisiblePasswordInputType(int inputType) {
5689         final int variation =
5690             inputType & (EditorInfo.TYPE_MASK_CLASS |
... EditorInfo.TYPE_MASK_VARIATION);
5691         return variation
5692             == (EditorInfo.TYPE_CLASS_TEXT |
... EditorInfo.TYPE_TEXT_VARIATION_VISIBLE_PASSWORD);
5693     }
5694
5695     /**
5696     * Directly change the content type integer of the text view,
... without
5697     * modifying any other state.
5698     * @see #setInputType(int)
5699     * @see android.text.InputType
5700     * @attr ref android.R.styleable#TextView_inputType
5701     */
5702     public void setRawInputType(int type) {
5703         if (type == InputType.TYPE_NULL && mEditor == null) return;
... //TYPE_NULL is the default value
5704         createEditorIfNeeded();
5705         mEditor.mInputType = type;
5706     }
5707
5708     /**
5709     * @return {@code null} if the key listener should use pre-0
... (locale-independent). Otherwise
5710     *     a {@code Locale} object that can be used to customize key
... various listeners.
5711     * @see DateKeyListener#getInstance(Locale)
5712     * @see DateTimeKeyListener#getInstance(Locale)
5713     * @see DigitsKeyListener#getInstance(Locale)
5714     * @see TimeKeyListener#getInstance(Locale)
5715     */
5716     @Nullable
5717     private Locale getCustomLocaleForKeyListenerOrNull() {
5718         if (!mUseInternationalizedInput) {
5719             // If the application does not target 0, stick to the
... previous behavior.
5720             return null;
5721         }
5722         final LocaleList locales = getImeHintLocales();
5723         if (locales == null) {
5724             // If the application does not explicitly specify IME hint
... locale, also stick to the
5725             // previous behavior.
5726             return null;
5727         }
5728         return locales.get(0);
```

```

5729     }
5730
5731     private void setInputType(int type, boolean direct) {
5732         final int cls = type & EditorInfo.TYPE_MASK_CLASS;
5733         KeyListener input;
5734         if (cls == EditorInfo.TYPE_CLASS_TEXT) {
5735             boolean autotext = (type &
... EditorInfo.TYPE_TEXT_FLAG_AUTO_CORRECT) != 0;
5736             TextKeyListener.Capitalize cap;
5737             if ((type & EditorInfo.TYPE_TEXT_FLAG_CAP_CHARACTERS) != 0)
... {
5738                 cap = TextKeyListener.Capitalize.CHARACTERS;
5739             } else if ((type & EditorInfo.TYPE_TEXT_FLAG_CAP_WORDS) !=
... 0) {
5740                 cap = TextKeyListener.Capitalize.WORDS;
5741             } else if ((type & EditorInfo.TYPE_TEXT_FLAG_CAP_SENTENCES)
... != 0) {
5742                 cap = TextKeyListener.Capitalize.SENTENCES;
5743             } else {
5744                 cap = TextKeyListener.Capitalize.NONE;
5745             }
5746             input = TextKeyListener.getInstance(autotext, cap);
5747         } else if (cls == EditorInfo.TYPE_CLASS_NUMBER) {
5748             final Locale locale = getCustomLocaleForKeyListenerOrNull();
5749             input = DigitsKeyListener.getInstance(
5750                 locale,
5751                 (type & EditorInfo.TYPE_NUMBER_FLAG_SIGNED) != 0,
5752                 (type & EditorInfo.TYPE_NUMBER_FLAG_DECIMAL) != 0);
5753             if (locale != null) {
5754                 // Override type, if necessary for i18n.
5755                 int newType = input.getInputType();
5756                 final int newClass = newType &
... EditorInfo.TYPE_MASK_CLASS;
5757                 if (newClass != EditorInfo.TYPE_CLASS_NUMBER) {
5758                     // The class is different from the original class.
... So we need to override
5759                     // 'type'. But we want to keep the password flag if
... it's there.
5760                     if ((type &
... EditorInfo.TYPE_NUMBER_VARIATION_PASSWORD) != 0) {
5761                         newType |=
... EditorInfo.TYPE_TEXT_VARIATION_PASSWORD;
5762                     }
5763                     type = newType;
5764                 }
5765             }
5766         } else if (cls == EditorInfo.TYPE_CLASS_DATETIME) {
5767             final Locale locale = getCustomLocaleForKeyListenerOrNull();
5768             switch (type & EditorInfo.TYPE_MASK_VARIATION) {
5769                 case EditorInfo.TYPE_DATETIME_VARIATION_DATE:

```



```
5770         input = DateKeyListener.getInstance(locale);
5771         break;
5772         case EditorInfo.TYPE_DATETIME_VARIATION_TIME:
5773             input = TimeKeyListener.getInstance(locale);
5774             break;
5775         default:
5776             input = DateTimeKeyListener.getInstance(locale);
5777             break;
5778     }
5779     if (mUseInternationalizedInput) {
5780         type = input.getInputType(); // Override type, if
... necessary for i18n.
5781     }
5782     } else if (cls == EditorInfo.TYPE_CLASS_PHONE) {
5783         input = DialerKeyListener.getInstance();
5784     } else {
5785         input = TextKeyListener.getInstance();
5786     }
5787     setRawInputType(type);
5788     mListenerChanged = false;
5789     if (direct) {
5790         createEditorIfNeeded();
5791         mEditor.mKeyListener = input;
5792     } else {
5793         setKeyListenerOnly(input);
5794     }
5795 }
5796
5797 /**
5798  * Get the type of the editable content.
5799  *
5800  * @see #setInputType(int)
5801  * @see android.text.InputType
5802  */
5803 public int getInputType() {
5804     return mEditor == null ? EditorInfo.TYPE_NULL :
... mEditor.mInputType;
5805 }
5806
5807 /**
5808  * Change the editor type integer associated with the text view,
... which
5809  * is reported to an Input Method Editor (IME) with {@link
... EditorInfo#imeOptions}
5810  * when it has focus.
5811  * @see #getImeOptions
5812  * @see android.view.inputmethod.EditorInfo
5813  * @attr ref android.R.styleable#TextView_imeOptions
5814  */
5815 public void setImeOptions(int imeOptions) {
```

```
5816     createEditorIfNeeded();
5817     mEditor.createInputContentTypeIfNeeded();
5818     mEditor.mInputContentType.imeOptions = imeOptions;
5819 }
5820
5821 /**
5822  * Get the type of the Input Method Editor (IME).
5823  * @return the type of the IME
5824  * @see #setImeOptions(int)
5825  * @see android.view.inputmethod.EditorInfo
5826  */
5827 public int getImeOptions() {
5828     return mEditor != null && mEditor.mInputContentType != null
5829         ? mEditor.mInputContentType.imeOptions :
5830     EditorInfo.IME_NULL;
5831 }
5832
5833 /**
5834  * Change the custom IME action associated with the text view, which
5835  * will be reported to an IME with {@link EditorInfo#actionLabel}
5836  * and {@link EditorInfo#actionId} when it has focus.
5837  * @see #getImeActionLabel
5838  * @see #getImeActionId
5839  * @see android.view.inputmethod.EditorInfo
5840  * @attr ref android.R.styleable#TextView_imeActionLabel
5841  * @attr ref android.R.styleable#TextView_imeActionId
5842  */
5843 public void setImeActionLabel(CharSequence label, int actionId) {
5844     createEditorIfNeeded();
5845     mEditor.createInputContentTypeIfNeeded();
5846     mEditor.mInputContentType.imeActionLabel = label;
5847     mEditor.mInputContentType.imeActionId = actionId;
5848 }
5849
5850 /**
5851  * Get the IME action label previous set with {@link
5852  * ... #setImeActionLabel}.
5853  *
5854  * @see #setImeActionLabel
5855  * @see android.view.inputmethod.EditorInfo
5856  */
5857 public CharSequence getImeActionLabel() {
5858     return mEditor != null && mEditor.mInputContentType != null
5859         ? mEditor.mInputContentType.imeActionLabel : null;
5860 }
5861
5862 /**
5863  * Get the IME action ID previous set with {@link
5864  * ... #setImeActionLabel}.
5865  *
```

```
5863 * @see #setImeActionLabel
5864 * @see android.view.inputmethod.EditorInfo
5865 */
5866 public int getImeActionId() {
5867     return mEditor != null && mEditor.mInputContentType != null
5868         ? mEditor.mInputContentType.imeActionId : 0;
5869 }
5870
5871 /**
5872  * Set a special listener to be called when an action is performed
5873  * on the text view. This will be called when the enter key is
5874  * pressed,
5875  * or when an action supplied to the IME is selected by the user.
5876  * Setting
5877  * this means that the normal hard key event will not insert a
5878  * newline
5879  * into the text view, even if it is multi-line; holding down the
5880  * ALT
5881  * modifier will, however, allow the user to insert a newline
5882  * character.
5883 */
5884 public void setOnEditorActionListener(OnEditorActionListener l) {
5885     createEditorIfNeeded();
5886     mEditor.createInputContentTypeIfNeeded();
5887     mEditor.mInputContentType.onEditorActionListener = l;
5888 }
5889
5890 /**
5891  * Called when an attached input method calls
5892  * {@link InputConnection#performEditorAction(int)}
5893  * InputConnection.performEditorAction()}
5894  * for this text view. The default implementation will call your
5895  * action
5896  * listener supplied to {@link #setOnEditorActionListener}, or
5897  * perform
5898  * a standard operation for {@link EditorInfo#IME_ACTION_NEXT}
5899  * EditorInfo.IME_ACTION_NEXT}, {@link
5900  * EditorInfo#IME_ACTION_PREVIOUS}
5901  * EditorInfo.IME_ACTION_PREVIOUS}, or {@link
5902  * EditorInfo#IME_ACTION_DONE}
5903  * EditorInfo.IME_ACTION_DONE}.
5904  *
5905  * <p>For backwards compatibility, if no IME options have been set
5906  * and the
5907  * text view would not normally advance focus on enter, then
5908  * the NEXT and DONE actions received here will be turned into an
5909  * enter
5910  * key down/up pair to go through the normal key handling.
5911  *
5912  * @param actionCode The code of the action being performed.
```

```
5902 *
5903 * @see #setOnEditorActionListener
5904 */
5905 public void onEditorAction(int actionCode) {
5906     final Editor.InputContentType ict = mEditor == null ? null :
... mEditor.mInputContentType;
5907     if (ict != null) {
5908         if (ict.onEditorActionListener != null) {
5909             if (ict.onEditorActionListener.onEditorAction(this,
5910                 actionCode, null)) {
5911                 return;
5912             }
5913         }
5914
5915         // This is the handling for some default action.
5916         // Note that for backwards compatibility we don't do this
5917         // default handling if explicit ime options have not been
... given,
5918         // instead turning this into the normal enter key codes that
... an
5919         // app may be expecting.
5920         if (actionCode == EditorInfo.IME_ACTION_NEXT) {
5921             View v = focusSearch(FOCUS_FORWARD);
5922             if (v != null) {
5923                 if (!v.requestFocus(FOCUS_FORWARD)) {
5924                     throw new IllegalStateException("focus search
... returned a view "
5925                         + "that wasn't able to take focus!");
5926                 }
5927             }
5928             return;
5929
5930         } else if (actionCode == EditorInfo.IME_ACTION_PREVIOUS) {
5931             View v = focusSearch(FOCUS_BACKWARD);
5932             if (v != null) {
5933                 if (!v.requestFocus(FOCUS_BACKWARD)) {
5934                     throw new IllegalStateException("focus search
... returned a view "
5935                         + "that wasn't able to take focus!");
5936                 }
5937             }
5938             return;
5939
5940         } else if (actionCode == EditorInfo.IME_ACTION_DONE) {
5941             InputMethodManager imm =
... InputMethodManager.peekInstance();
5942             if (imm != null && imm.isActive(this)) {
5943                 imm.hideSoftInputFromWindow(getWindowToken(), 0);
5944             }
5945             return;
```

```
5946     }
5947     }
5948
5949     ViewRootImpl viewRootImpl = getViewRootImpl();
5950     if (viewRootImpl != null) {
5951         long eventTime = SystemClock.uptimeMillis();
5952         viewRootImpl.dispatchKeyFromIme(
5953             new KeyEvent(eventTime, eventTime,
5954                 KeyEvent.ACTION_DOWN, KeyEvent.KEYCODE_ENTER, 0, 0,
5955                 KeyCharacterMap.VIRTUAL_KEYBOARD, 0,
5956                 KeyEvent.FLAG_SOFT_KEYBOARD |
... KeyEvent.FLAG_KEEP_TOUCH_MODE
5957                 | KeyEvent.FLAG_EDITOR_ACTION));
5958         viewRootImpl.dispatchKeyFromIme(
5959             new KeyEvent(SystemClock.uptimeMillis(), eventTime,
5960                 KeyEvent.ACTION_UP, KeyEvent.KEYCODE_ENTER, 0, 0,
5961                 KeyCharacterMap.VIRTUAL_KEYBOARD, 0,
5962                 KeyEvent.FLAG_SOFT_KEYBOARD |
... KeyEvent.FLAG_KEEP_TOUCH_MODE
5963                 | KeyEvent.FLAG_EDITOR_ACTION));
5964     }
5965 }
5966
5967 /**
5968  * Set the private content type of the text, which is the
5969  * {@link EditorInfo#privateImeOptions EditorInfo.privateImeOptions}
5970  * field that will be filled in when creating an input connection.
5971  *
5972  * @see #getPrivateImeOptions()
5973  * @see EditorInfo#privateImeOptions
5974  * @attr ref android.R.styleable#TextView_privateImeOptions
5975  */
5976 public void setPrivateImeOptions(String type) {
5977     createEditorIfNeeded();
5978     mEditor.createInputContentTypeIfNeeded();
5979     mEditor.mInputContentType.privateImeOptions = type;
5980 }
5981
5982 /**
5983  * Get the private type of the content.
5984  *
5985  * @see #setPrivateImeOptions(String)
5986  * @see EditorInfo#privateImeOptions
5987  */
5988 public String getPrivateImeOptions() {
5989     return mEditor != null && mEditor.mInputContentType != null
5990         ? mEditor.mInputContentType.privateImeOptions : null;
5991 }
5992
5993 /**
```

```

5994 * Set the extra input data of the text, which is the
5995 * {@link EditorInfo#extras TextBoxAttribute.extras}
5996 * Bundle that will be filled in when creating an input connection.
... The
5997 * given integer is the resource identifier of an XML resource
... holding an
5998 * {@link android.R.styleable#InputExtras <input-extras>} XML
... tree.
5999 *
6000 * @see #getInputExtras(boolean)
6001 * @see EditorInfo#extras
6002 * @attr ref android.R.styleable#TextView_editorExtras
6003 */
6004 public void setInputExtras(@XmlRes int xmlResId) throws
... XmlPullParserException, IOException {
6005     createEditorIfNeeded();
6006     XmlResourceParser parser = getResources().getXml(xmlResId);
6007     mEditor.createInputContentTypeIfNeeded();
6008     mEditor.mInputContentType.extras = new Bundle();
6009     getResources().parseBundleExtras(parser,
... mEditor.mInputContentType.extras);
6010 }
6011
6012 /**
6013 * Retrieve the input extras currently associated with the text
... view, which
6014 * can be viewed as well as modified.
6015 *
6016 * @param create If true, the extras will be created if they don't
... already
6017 * exist. Otherwise, null will be returned if none have been
... created.
6018 * @see #setInputExtras(int)
6019 * @see EditorInfo#extras
6020 * @attr ref android.R.styleable#TextView_editorExtras
6021 */
6022 public Bundle getInputExtras(boolean create) {
6023     if (mEditor == null && !create) return null;
6024     createEditorIfNeeded();
6025     if (mEditor.mInputContentType == null) {
6026         if (!create) return null;
6027         mEditor.createInputContentTypeIfNeeded();
6028     }
6029     if (mEditor.mInputContentType.extras == null) {
6030         if (!create) return null;
6031         mEditor.mInputContentType.extras = new Bundle();
6032     }
6033     return mEditor.mInputContentType.extras;
6034 }
6035

```

```
6036 /**
6037     * Change "hint" locales associated with the text view, which will
... be reported to an IME with
6038     * {@link EditorInfo#hintLocales} when it has focus.
6039     *
6040     * Starting with Android O, this also causes internationalized
... listeners to be created (or
6041     * change locale) based on the first locale in the input locale
... list.
6042     *
6043     * <p><strong>Note:</strong> If you want new "hint" to take effect
... immediately you need to
6044     * call {@link InputMethodManager#restartInput(View)}.</p>
6045     * @param hintLocales List of the languages that the user is
... supposed to switch to no matter
6046     * what input method subtype is currently used. Set {@code null} to
... clear the current "hint".
6047     * @see #getImeHintLocales()
6048     * @see android.view.inputmethod.EditorInfo#hintLocales
6049     */
6050     public void setImeHintLocales(@Nullable LocaleList hintLocales) {
6051         createEditorIfNeeded();
6052         mEditor.createInputContentTypeIfNeeded();
6053         mEditor.mInputContentType.imeHintLocales = hintLocales;
6054         if (mUseInternationalizedInput) {
6055             changeListenerLocaleTo(hintLocales == null ? null :
... hintLocales.get(0));
6056         }
6057     }
6058
6059     /**
6060     * @return The current languages list "hint". {@code null} when no
... "hint" is available.
6061     * @see #setImeHintLocales(LocaleList)
6062     * @see android.view.inputmethod.EditorInfo#hintLocales
6063     */
6064     @Nullable
6065     public LocaleList getImeHintLocales() {
6066         if (mEditor == null) {
6067             return null;
6068         }
6069         if (mEditor.mInputContentType == null) {
6070             return null;
6071         }
6072         return mEditor.mInputContentType.imeHintLocales;
6073     }
6074
6075     /**
6076     * Returns the error message that was set to be displayed with
6077     * {@link #setError}, or <code>null</code> if no error was set
```

```
6078 * or if it the error was cleared by the widget after user input.
6079 */
6080 public CharSequence getError() {
6081     return mEditor == null ? null : mEditor.mError;
6082 }
6083
6084 /**
6085  * Sets the right-hand compound drawable of the TextView to the
... "error"
6086  * icon and sets an error message that will be displayed in a popup
... when
6087  * the TextView has focus. The icon and error message will be reset
... to
6088  * null when any key events cause changes to the TextView's text.
... If the
6089  * <code>error</code> is <code>null</code>, the error message and
... icon
6090  * will be cleared.
6091 */
6092 @android.view.RemotableViewMethod
6093 public void setError(CharSequence error) {
6094     if (error == null) {
6095         setError(null, null);
6096     } else {
6097         Drawable dr = getContext().getDrawable(
6098
... com.android.internal.R.drawable.indicator_input_error);
6099
6100         dr.setBounds(0, 0, dr.getIntrinsicWidth(),
... dr.getIntrinsicHeight());
6101         setError(error, dr);
6102     }
6103 }
6104
6105 /**
6106  * Sets the right-hand compound drawable of the TextView to the
... specified
6107  * icon and sets an error message that will be displayed in a popup
... when
6108  * the TextView has focus. The icon and error message will be reset
... to
6109  * null when any key events cause changes to the TextView's text.
... The
6110  * drawable must already have had {@link Drawable#setBounds} set on
... it.
6111  * If the <code>error</code> is <code>null</code>, the error message
... will
6112  * be cleared (and you should provide a <code>null</code> icon as
... well).
6113  */
```



```
6114     public void setError(CharSequence error, Drawable icon) {
6115         createEditorIfNeeded();
6116         mEditor.setError(error, icon);
6117         notifyViewAccessibilityStateChangedIfNeeded(
6118             AccessibilityEvent.CONTENT_CHANGE_TYPE_UNDEFINED);
6119     }
6120
6121     @Override
6122     protected boolean setFrame(int l, int t, int r, int b) {
6123         boolean result = super.setFrame(l, t, r, b);
6124
6125         if (mEditor != null) mEditor.setFrame();
6126
6127         restartMarqueeIfNeeded();
6128
6129         return result;
6130     }
6131
6132     private void restartMarqueeIfNeeded() {
6133         if (mRestartMarquee && mEllipsize ==
6134             ... TextUtils.TruncateAt.MARQUEE) {
6135             mRestartMarquee = false;
6136             startMarquee();
6137         }
6138     }
6139
6140     /**
6141     * Sets the list of input filters that will be used if the buffer is
6142     * Editable. Has no effect otherwise.
6143     *
6144     * @attr ref android.R.styleable#TextView_maxLength
6145     */
6146     public void setFilters(InputFilter[] filters) {
6147         if (filters == null) {
6148             throw new IllegalArgumentException();
6149         }
6150
6151         mFilters = filters;
6152
6153         if (mText instanceof Editable) {
6154             setFilters((Editable) mText, filters);
6155         }
6156     }
6157
6158     /**
6159     * Sets the list of input filters on the specified Editable,
6160     * and includes mInput in the list if it is an InputFilter.
6161     */
6162     private void setFilters(Editable e, InputFilter[] filters) {
```



```
6206
6207     int getVerticalOffset(boolean forceNormal) {
6208         int voffset = 0;
6209         final int gravity = mGravity & Gravity.VERTICAL_GRAVITY_MASK;
6210
6211         Layout l = mLayout;
6212         if (!forceNormal && mText.length() == 0 && mHintLayout != null)
6213     {
6214             l = mHintLayout;
6215         }
6216
6217         if (gravity != Gravity.TOP) {
6218             int boxht = getBoxHeight(l);
6219             int textht = l.getHeight();
6220
6221             if (textht < boxht) {
6222                 if (gravity == Gravity.BOTTOM) {
6223                     voffset = boxht - textht;
6224                 } else { // (gravity == Gravity.CENTER_VERTICAL)
6225                     voffset = (boxht - textht) >> 1;
6226                 }
6227             }
6228         }
6229         return voffset;
6230     }
6231
6232     private int getBottomVerticalOffset(boolean forceNormal) {
6233         int voffset = 0;
6234         final int gravity = mGravity & Gravity.VERTICAL_GRAVITY_MASK;
6235
6236         Layout l = mLayout;
6237         if (!forceNormal && mText.length() == 0 && mHintLayout != null)
6238     {
6239             l = mHintLayout;
6240         }
6241
6242         if (gravity != Gravity.BOTTOM) {
6243             int boxht = getBoxHeight(l);
6244             int textht = l.getHeight();
6245
6246             if (textht < boxht) {
6247                 if (gravity == Gravity.TOP) {
6248                     voffset = boxht - textht;
6249                 } else { // (gravity == Gravity.CENTER_VERTICAL)
6250                     voffset = (boxht - textht) >> 1;
6251                 }
6252             }
6253         }
6254         return voffset;
6255     }
```

```
6254
6255     void invalidateCursorPath() {
6256         if (mHighlightPathBogus) {
6257             invalidateCursor();
6258         } else {
6259             final int horizontalPadding = getCompoundPaddingLeft();
6260             final int verticalPadding = getExtendedPaddingTop() +
... getVerticalOffset(true);
6261
6262             if (mEditor.mCursorCount == 0) {
6263                 synchronized (TEMP_RECTF) {
6264                     /*
6265                     of the
...
6266                     coordinates is that
...
6267                     Browser) have
...
6268                     are
...
6269                     should
...
6270                     instead of
...
6271                     sometimes missing half a pixel.
6272                     */
6273                     float thick = (float)
... Math.ceil(mTextPaint.getStrokeWidth());
6274                     if (thick < 1.0f) {
6275                         thick = 1.0f;
6276                     }
6277
6278                     thick /= 2.0f;
6279
6280                     // mHighlightPath is guaranteed to be non null at
... that point.
6281                     mHighlightPath.computeBounds(TEMP_RECTF, false);
6282
6283                     invalidate((int) Math.floor(horizontalPadding +
... TEMP_RECTF.left - thick),
6284                                 (int) Math.floor(verticalPadding +
... TEMP_RECTF.top - thick),
6285                                 (int) Math.ceil(horizontalPadding +
... TEMP_RECTF.right + thick),
6286                                 (int) Math.ceil(verticalPadding +
... TEMP_RECTF.bottom + thick));
6287                 }
6288             } else {
6289                 for (int i = 0; i < mEditor.mCursorCount; i++) {
6290                     Rect bounds =
```

```

6290... mEditor.mCursorDrawable[1].getBounds();
6291         invalidate(bounds.left + horizontalPadding,
... bounds.top + verticalPadding,
6292                 bounds.right + horizontalPadding,
... bounds.bottom + verticalPadding);
6293     }
6294 }
6295 }
6296 }
6297
6298 void invalidateCursor() {
6299     int where = getSelectionEnd();
6300
6301     invalidateCursor(where, where, where);
6302 }
6303
6304 private void invalidateCursor(int a, int b, int c) {
6305     if (a >= 0 || b >= 0 || c >= 0) {
6306         int start = Math.min(Math.min(a, b), c);
6307         int end = Math.max(Math.max(a, b), c);
6308         invalidateRegion(start, end, true /* Also invalidates
... blinking cursor */);
6309     }
6310 }
6311
6312 /**
6313  * Invalidates the region of text enclosed between the start and end
... text offsets.
6314  */
6315 void invalidateRegion(int start, int end, boolean invalidateCursor)
... {
6316     if (mLayout == null) {
6317         invalidate();
6318     } else {
6319         int lineStart = mLayout.getLineForOffset(start);
6320         int top = mLayout.getLineTop(lineStart);
6321
6322         // This is ridiculous, but the descent from the line above
6323         // can hang down into the line we really want to redraw,
6324         // so we have to invalidate part of the line above to make
6325         // sure everything that needs to be redrawn really is.
6326         // (But not the whole line above, because that would cause
6327         // the same problem with the descenders on the line above
... it!)
6328         if (lineStart > 0) {
6329             top -= mLayout.getLineDescent(lineStart - 1);
6330         }
6331
6332         int lineEnd;
6333

```

```
6334     if (start == end) {
6335         lineEnd = lineStart;
6336     } else {
6337         lineEnd = mLayout.getLineForOffset(end);
6338     }
6339
6340     int bottom = mLayout.getLineBottom(lineEnd);
6341
6342     // mEditor can be null in case selection is set
6343     programmatically.
6344     if (invalidateCursor && mEditor != null) {
6345         for (int i = 0; i < mEditor.mCursorCount; i++) {
6346             Rect bounds =
6347                 mEditor.mCursorDrawable[i].getBounds();
6348             top = Math.min(top, bounds.top);
6349             bottom = Math.max(bottom, bounds.bottom);
6350         }
6351     }
6352
6353     final int compoundPaddingLeft = getCompoundPaddingLeft();
6354     final int verticalPadding = getExtendedPaddingTop() +
6355     getVerticalOffset(true);
6356
6357     int left, right;
6358     if (lineStart == lineEnd && !invalidateCursor) {
6359         left = (int) mLayout.getPrimaryHorizontal(start);
6360         right = (int) (mLayout.getPrimaryHorizontal(end) + 1.0);
6361         left += compoundPaddingLeft;
6362         right += compoundPaddingLeft;
6363     } else {
6364         // Rectangle bounding box when the region spans several
6365         lines
6366         left = compoundPaddingLeft;
6367         right = getWidth() - getCompoundPaddingRight();
6368     }
6369
6370     invalidate(mScrollX + left, verticalPadding + top,
6371               mScrollX + right, verticalPadding + bottom);
6372 }
6373
6374 private void registerForPreDraw() {
6375     if (!mPreDrawRegistered) {
6376         getViewTreeObserver().addOnPreDrawListener(this);
6377         mPreDrawRegistered = true;
6378     }
6379 }
6380
6381 private void unregisterForPreDraw() {
6382     getViewTreeObserver().removeOnPreDrawListener(this);
6383 }
```

```
6380     mPreDrawRegistered = false;
6381     mPreDrawListenerDetached = false;
6382 }
6383
6384 /**
6385  * {@inheritDoc}
6386  */
6387 @Override
6388 public boolean onPreDraw() {
6389     if (mLayout == null) {
6390         assumeLayout();
6391     }
6392
6393     if (mMovement != null) {
6394         /* This code also provides auto-scrolling when a cursor is
... moved using a
6395         * CursorController (insertion point or selection limits).
6396         * For selection, ensure start or end is visible depending
... on controller's state.
6397         */
6398         int curs = getSelectionEnd();
6399         // Do not create the controller if it is not already
... created.
6400         if (mEditor != null &&
... mEditor.mSelectionModifierCursorController != null
6401             &&
... mEditor.mSelectionModifierCursorController.isSelectionStartDragged()) {
6402             curs = getSelectionStart();
6403         }
6404
6405         /*
6406         * TODO: This should really only keep the end in view if
6407         * it already was before the text changed. I'm not sure
6408         * of a good way to tell from here if it was.
6409         */
6410         if (curs < 0 && (mGravity & Gravity.VERTICAL_GRAVITY_MASK)
... == Gravity.BOTTOM) {
6411             curs = mText.length();
6412         }
6413
6414         if (curs >= 0) {
6415             bringPointIntoView(curs);
6416         }
6417     } else {
6418         bringTextIntoView();
6419     }
6420
6421     // This has to be checked here since:
6422     // - onFocusChanged cannot start it when focus is given to a
... view with selected text (after
```

```
6423 // a screen rotation) since layout is not yet initialized at
... that point.
6424     if (mEditor != null && mEditor.mCreatedWithASelection) {
6425         mEditor.refreshTextActionMode();
6426         mEditor.mCreatedWithASelection = false;
6427     }
6428
6429     unregisterForPreDraw();
6430
6431     return true;
6432 }
6433
6434 @Override
6435 protected void onAttachedToWindow() {
6436     super.onAttachedToWindow();
6437
6438     if (mEditor != null) mEditor.onAttachedToWindow();
6439
6440     if (mPreDrawListenerDetached) {
6441         getViewTreeObserver().addOnPreDrawListener(this);
6442         mPreDrawListenerDetached = false;
6443     }
6444 }
6445
6446 /** @hide */
6447 @Override
6448 protected void onDetachedFromWindowInternal() {
6449     if (mPreDrawRegistered) {
6450         getViewTreeObserver().removeOnPreDrawListener(this);
6451         mPreDrawListenerDetached = true;
6452     }
6453
6454     resetResolvedDrawables();
6455
6456     if (mEditor != null) mEditor.onDetachedFromWindow();
6457
6458     super.onDetachedFromWindowInternal();
6459 }
6460
6461 @Override
6462 public void onScreenStateChanged(int screenState) {
6463     super.onScreenStateChanged(screenState);
6464     if (mEditor != null) mEditor.onScreenStateChanged(screenState);
6465 }
6466
6467 @Override
6468 protected boolean isPaddingOffsetRequired() {
6469     return mShadowRadius != 0 || mDrawables != null;
6470 }
6471
```



```
6472 @Override
6473 protected int getLeftPaddingOffset() {
6474     return getCompoundPaddingLeft() - mPaddingLeft
6475         + (int) Math.min(0, mShadowDx - mShadowRadius);
6476 }
6477
6478 @Override
6479 protected int getTopPaddingOffset() {
6480     return (int) Math.min(0, mShadowDy - mShadowRadius);
6481 }
6482
6483 @Override
6484 protected int getBottomPaddingOffset() {
6485     return (int) Math.max(0, mShadowDy + mShadowRadius);
6486 }
6487
6488 @Override
6489 protected int getRightPaddingOffset() {
6490     return -(getCompoundPaddingRight() - mPaddingRight)
6491         + (int) Math.max(0, mShadowDx + mShadowRadius);
6492 }
6493
6494 @Override
6495 protected boolean verifyDrawable(@NonNull Drawable who) {
6496     final boolean verified = super.verifyDrawable(who);
6497     if (!verified && mDrawables != null) {
6498         for (Drawable dr : mDrawables.mShowing) {
6499             if (who == dr) {
6500                 return true;
6501             }
6502         }
6503     }
6504     return verified;
6505 }
6506
6507 @Override
6508 public void jumpDrawablesToCurrentState() {
6509     super.jumpDrawablesToCurrentState();
6510     if (mDrawables != null) {
6511         for (Drawable dr : mDrawables.mShowing) {
6512             if (dr != null) {
6513                 dr.jumpToCurrentState();
6514             }
6515         }
6516     }
6517 }
6518
6519 @Override
6520 public void invalidateDrawable(@NonNull Drawable drawable) {
6521     boolean handled = false;
```

```
6522
6523     if (verifyDrawable(drawable)) {
6524         final Rect dirty = drawable.getBounds();
6525         int scrollX = mScrollX;
6526         int scrollY = mScrollY;
6527
6528         // IMPORTANT: The coordinates below are based on the
... coordinates computed
6529         // for each compound drawable in onDraw(). Make sure to
... update each section
6530         // accordingly.
6531         final TextView.Drawables drawables = mDrawables;
6532         if (drawables != null) {
6533             if (drawable == drawables.mShowing[Drawables.LEFT]) {
6534                 final int compoundPaddingTop =
... getCompoundPaddingTop();
6535                 final int compoundPaddingBottom =
... getCompoundPaddingBottom();
6536                 final int vspace = mBottom - mTop -
... compoundPaddingBottom - compoundPaddingTop;
6537
6538                 scrollX += mPaddingLeft;
6539                 scrollY += compoundPaddingTop + (vspace -
... drawables.mDrawableHeightLeft) / 2;
6540                 handled = true;
6541             } else if (drawable ==
... drawables.mShowing[Drawables.RIGHT]) {
6542                 final int compoundPaddingTop =
... getCompoundPaddingTop();
6543                 final int compoundPaddingBottom =
... getCompoundPaddingBottom();
6544                 final int vspace = mBottom - mTop -
... compoundPaddingBottom - compoundPaddingTop;
6545
6546                 scrollX += (mRight - mLeft - mPaddingRight -
... drawables.mDrawableSizeRight);
6547                 scrollY += compoundPaddingTop + (vspace -
... drawables.mDrawableHeightRight) / 2;
6548                 handled = true;
6549             } else if (drawable ==
... drawables.mShowing[Drawables.TOP]) {
6550                 final int compoundPaddingLeft =
... getCompoundPaddingLeft();
6551                 final int compoundPaddingRight =
... getCompoundPaddingRight();
6552                 final int hspace = mRight - mLeft -
... compoundPaddingRight - compoundPaddingLeft;
6553
6554                 scrollX += compoundPaddingLeft + (hspace -
... drawables.mDrawableWidthTop) / 2;
```

```
6555         scrolly += mPaddingTop;
6556         handled = true;
6557     } else if (drawable ==
... drawables.mShowing[Drawables.BOTTOM]) {
6558         final int compoundPaddingLeft =
... getCompoundPaddingLeft();
6559         final int compoundPaddingRight =
... getCompoundPaddingRight();
6560         final int hspace = mRight - mLeft -
... compoundPaddingRight - compoundPaddingLeft;
6561
6562         scrollX += compoundPaddingLeft + (hspace -
... drawables.mDrawableWidthBottom) / 2;
6563         scrolly += (mBottom - mTop - mPaddingBottom -
... drawables.mDrawableSizeBottom);
6564         handled = true;
6565     }
6566 }
6567
6568     if (handled) {
6569         invalidate(dirty.left + scrollX, dirty.top + scrolly,
6570                 dirty.right + scrollX, dirty.bottom + scrolly);
6571     }
6572 }
6573
6574     if (!handled) {
6575         super.invalidateDrawable(drawable);
6576     }
6577 }
6578
6579     @Override
6580     public boolean hasOverlappingRendering() {
6581         // horizontal fading edge causes SaveLayerAlpha, which doesn't
... support alpha modulation
6582         return ((getBackground() != null && getBackground().getCurrent()
... != null)
6583                 || mText instanceof Spannable || hasSelection()
6584                 || isHorizontalFadingEdgeEnabled());
6585     }
6586
6587     /**
6588     *
6589     * Returns the state of the {@code textIsSelectable} flag (See
6590     * {@link #setTextIsSelectable setTextIsSelectable()}). Although you
... have to set this flag
6591     * to allow users to select and copy text in a non-editable
... TextView, the content of an
6592     * {@link EditText} can always be selected, independently of the
... value of this flag.
6593     * <p>
```

```
6594 *
6595 * @return True if the text displayed in this TextView can be
... selected by the user.
6596 *
6597 * @attr ref android.R.styleable#TextView_textIsSelectable
6598 */
6599 public boolean isTextSelectable() {
6600     return mEditor == null ? false : mEditor.mTextIsSelectable;
6601 }
6602
6603 /**
6604 * Sets whether the content of this view is selectable by the user.
... The default is
6605 * {@code false}, meaning that the content is not selectable.
6606 * <p>
6607 * When you use a TextView to display a useful piece of information
... to the user (such as a
6608 * contact's address), make it selectable, so that the user can
... select and copy its
6609 * content. You can also use set the XML attribute
6610 * {@link android.R.styleable#TextView_textIsSelectable} to "true".
6611 * <p>
6612 * When you call this method to set the value of {@code
... textIsSelectable}, it sets
6613 * the flags {@code focusable}, {@code focusableInTouchMode}, {@code
... clickable},
6614 * and {@code longClickable} to the same value. These flags
... correspond to the attributes
6615 * {@link android.R.styleable#View_focusable android:focusable},
6616 * {@link android.R.styleable#View_focusableInTouchMode
... android:focusableInTouchMode},
6617 * {@link android.R.styleable#View_clickable android:clickable}, and
6618 * {@link android.R.styleable#View_longClickable
... android:longClickable}. To restore any of these
6619 * flags to a state you had set previously, call one or more of the
... following methods:
6620 * {@link #setFocusable(boolean) setFocusable()},
6621 * {@link #setFocusableInTouchMode(boolean)
... setFocusableInTouchMode()},
6622 * {@link #setClickable(boolean) setClickable()} or
6623 * {@link #setLongClickable(boolean) setLongClickable()}.
6624 *
6625 * @param selectable Whether the content of this TextView should be
... selectable.
6626 */
6627 public void setTextIsSelectable(boolean selectable) {
6628     if (!selectable && mEditor == null) return; // false is default
... value with no edit data
6629
6630     createEditorIfNeeded();
```

```
6631     if (mEditor.mTextIsSelectable == selectable) return;
6632
6633     mEditor.mTextIsSelectable = selectable;
6634     setFocusableInTouchMode(selectable);
6635     setFocusable(FOCUSABLE_AUTO);
6636     setClickable(selectable);
6637     setLongClickable(selectable);
6638
6639     // mInputType should already be EditorInfo.TYPE_NULL and mInput
... should be null
6640
6641     setMovementMethod(selectable ?
... ArrowKeyMovementMethod.getInstance() : null);
6642     setText(mText, selectable ? BufferType.SPANNABLE :
... BufferType.NORMAL);
6643
6644     // Called by setText above, but safer in case of future code
... changes
6645     mEditor.prepareCursorControllers();
6646 }
6647
6648 @Override
6649 protected int[] onCreateDrawableState(int extraSpace) {
6650     final int[] drawableState;
6651
6652     if (mSingleLine) {
6653         drawableState = super.onCreateDrawableState(extraSpace);
6654     } else {
6655         drawableState = super.onCreateDrawableState(extraSpace + 1);
6656         mergeDrawableStates(drawableState, MULTILINE_STATE_SET);
6657     }
6658
6659     if (isTextSelectable()) {
6660         // Disable pressed state, which was introduced when TextView
... was made clickable.
6661         // Prevents text color change.
6662         // setClickable(false) would have a similar effect, but it
... also disables focus changes
6663         // and long press actions, which are both needed by text
... selection.
6664         final int length = drawableState.length;
6665         for (int i = 0; i < length; i++) {
6666             if (drawableState[i] == R.attr.state_pressed) {
6667                 final int[] nonPressedState = new int[length - 1];
6668                 System.arraycopy(drawableState, 0, nonPressedState,
... 0, i);
6669                 System.arraycopy(drawableState, i + 1,
... nonPressedState, i, length - i - 1);
6670                 return nonPressedState;
6671             }

```

```
6672     }
6673     }
6674
6675     return drawableState;
6676 }
6677
6678 private Path getUpdatedHighlightPath() {
6679     Path highlight = null;
6680     Paint highlightPaint = mHighlightPaint;
6681
6682     final int selStart = getSelectionStart();
6683     final int selEnd = getSelectionEnd();
6684     if (mMovement != null && (isFocused() || isPressed()) &&
... selStart >= 0) {
6685         if (selStart == selEnd) {
6686             if (mEditor != null && mEditor.isCursorVisible()
6687                 && (SystemClock.uptimeMillis() -
... mEditor.mShowCursor)
6688                 % (2 * Editor.BLINK) < Editor.BLINK) {
6689                 if (mHighlightPathBogus) {
6690                     if (mHighlightPath == null) mHighlightPath = new
... Path();
6691                     mHighlightPath.reset();
6692                     mLayout.setCursorPath(selStart, mHighlightPath,
... mText);
6693                     mEditor.updateCursorsPositions();
6694                     mHighlightPathBogus = false;
6695                 }
6696
6697                 // XXX should pass to skin instead of drawing
... directly
6698                 highlightPaint.setColor(mCurTextColor);
6699                 highlightPaint.setStyle(Paint.Style.STROKE);
6700                 highlight = mHighlightPath;
6701             }
6702         } else {
6703             if (mHighlightPathBogus) {
6704                 if (mHighlightPath == null) mHighlightPath = new
... Path();
6705                 mHighlightPath.reset();
6706                 mLayout.getSelectionPath(selStart, selEnd,
... mHighlightPath);
6707                 mHighlightPathBogus = false;
6708             }
6709
6710             // XXX should pass to skin instead of drawing directly
6711             highlightPaint.setColor(mHighlightColor);
6712             highlightPaint.setStyle(Paint.Style.FILL);
6713
6714             highlight = mHighlightPath;
```

```
6715     }
6716     }
6717     return highlight;
6718 }
6719
6720 /**
6721  * @hide
6722  */
6723 public int getHorizontalOffsetForDrawables() {
6724     return 0;
6725 }
6726
6727 @Override
6728 protected void onDraw(Canvas canvas) {
6729     restartMarqueeIfNeeded();
6730
6731     // Draw the background for this view
6732     super.onDraw(canvas);
6733
6734     final int compoundPaddingLeft = getCompoundPaddingLeft();
6735     final int compoundPaddingTop = getCompoundPaddingTop();
6736     final int compoundPaddingRight = getCompoundPaddingRight();
6737     final int compoundPaddingBottom = getCompoundPaddingBottom();
6738     final int scrollX = mScrollX;
6739     final int scrollY = mScrollY;
6740     final int right = mRight;
6741     final int left = mLeft;
6742     final int bottom = mBottom;
6743     final int top = mTop;
6744     final boolean isLayoutRtl = isLayoutRtl();
6745     final int offset = getHorizontalOffsetForDrawables();
6746     final int leftOffset = isLayoutRtl ? 0 : offset;
6747     final int rightOffset = isLayoutRtl ? offset : 0;
6748
6749     final Drawables dr = mDrawables;
6750     if (dr != null) {
6751         /*
6752          * Compound, not extended, because the icon is not clipped
6753          * if the text height is smaller.
6754          */
6755
6756         int vspace = bottom - top - compoundPaddingBottom -
6757 ... compoundPaddingTop;
6758         int hspace = right - left - compoundPaddingRight -
6759 ... compoundPaddingLeft;
6760
6761         // IMPORTANT: The coordinates computed are also used in
6762 ... invalidateDrawable()
6763         // Make sure to update invalidateDrawable() when changing
6764 ... this code.
```

```
6761         if (dr.mShowing[Drawables.LEFT] != null) {
6762             canvas.save();
6763             canvas.translate(scrollX + mPaddingLeft + leftOffset,
6764                 scrolly + compoundPaddingTop + (vspace -
... dr.mDrawableHeightLeft) / 2);
6765             dr.mShowing[Drawables.LEFT].draw(canvas);
6766             canvas.restore();
6767         }
6768
6769         // IMPORTANT: The coordinates computed are also used in
... invalidateDrawable()
6770         // Make sure to update invalidateDrawable() when changing
... this code.
6771         if (dr.mShowing[Drawables.RIGHT] != null) {
6772             canvas.save();
6773             canvas.translate(scrollX + right - left - mPaddingRight
6774                 - dr.mDrawableSizeRight - rightOffset,
6775                 scrolly + compoundPaddingTop + (vspace -
... dr.mDrawableHeightRight) / 2);
6776             dr.mShowing[Drawables.RIGHT].draw(canvas);
6777             canvas.restore();
6778         }
6779
6780         // IMPORTANT: The coordinates computed are also used in
... invalidateDrawable()
6781         // Make sure to update invalidateDrawable() when changing
... this code.
6782         if (dr.mShowing[Drawables.TOP] != null) {
6783             canvas.save();
6784             canvas.translate(scrollX + compoundPaddingLeft
6785                 + (hspace - dr.mDrawableWidthTop) / 2, scrolly +
... mPaddingTop);
6786             dr.mShowing[Drawables.TOP].draw(canvas);
6787             canvas.restore();
6788         }
6789
6790         // IMPORTANT: The coordinates computed are also used in
... invalidateDrawable()
6791         // Make sure to update invalidateDrawable() when changing
... this code.
6792         if (dr.mShowing[Drawables.BOTTOM] != null) {
6793             canvas.save();
6794             canvas.translate(scrollX + compoundPaddingLeft
6795                 + (hspace - dr.mDrawableWidthBottom) / 2,
6796                 scrolly + bottom - top - mPaddingBottom -
... dr.mDrawableSizeBottom);
6797             dr.mShowing[Drawables.BOTTOM].draw(canvas);
6798             canvas.restore();
6799         }
6800     }
```



```
6801
6802     int color = mCurTextColor;
6803
6804     if (mLayout == null) {
6805         assumeLayout();
6806     }
6807
6808     Layout layout = mLayout;
6809
6810     if (mHint != null && mText.length() == 0) {
6811         if (mHintTextColor != null) {
6812             color = mCurHintTextColor;
6813         }
6814
6815         layout = mHintLayout;
6816     }
6817
6818     mTextPaint.setColor(color);
6819     mTextPaint.drawableState = getDrawableState();
6820
6821     canvas.save();
6822     /* Would be faster if we didn't have to do this. Can we chop
... the
6823         (displayable) text so that we don't need to do this ever?
6824     */
6825
6826     int extendedPaddingTop = getExtendedPaddingTop();
6827     int extendedPaddingBottom = getExtendedPaddingBottom();
6828
6829     final int vspace = mBottom - mTop - compoundPaddingBottom -
... compoundPaddingTop;
6830     final int maxScrollY = mLayout.getHeight() - vspace;
6831
6832     float clipLeft = compoundPaddingLeft + scrollX;
6833     float clipTop = (scrollY == 0) ? 0 : extendedPaddingTop +
... scrollY;
6834     float clipRight = right - left - getCompoundPaddingRight() +
... scrollX;
6835     float clipBottom = bottom - top + scrollY
6836         - ((scrollY == maxScrollY) ? 0 : extendedPaddingBottom);
6837
6838     if (mShadowRadius != 0) {
6839         clipLeft += Math.min(0, mShadowDx - mShadowRadius);
6840         clipRight += Math.max(0, mShadowDx + mShadowRadius);
6841
6842         clipTop += Math.min(0, mShadowDy - mShadowRadius);
6843         clipBottom += Math.max(0, mShadowDy + mShadowRadius);
6844     }
6845
6846     canvas.clipRect(clipLeft, clipTop, clipRight, clipBottom);
```

```
6847
6848     int voffsetText = 0;
6849     int voffsetCursor = 0;
6850
6851     // translate in by our padding
6852     /* shortcircuit calling getVerticalOffset() */
6853     if ((mGravity & Gravity.VERTICAL_GRAVITY_MASK) != Gravity.TOP) {
6854         voffsetText = getVerticalOffset(false);
6855         voffsetCursor = getVerticalOffset(true);
6856     }
6857     canvas.translate(compoundPaddingLeft, extendedPaddingTop +
... voffsetText);
6858
6859     final int layoutDirection = getLayoutDirection();
6860     final int absoluteGravity = Gravity.getAbsoluteGravity(mGravity,
... layoutDirection);
6861     if (isMarqueeFadeEnabled()) {
6862         if (!mSingleLine && getLineCount() == 1 && canMarquee()
6863             && (absoluteGravity &
... Gravity.HORIZONTAL_GRAVITY_MASK) != Gravity.LEFT) {
6864         final int width = mRight - mLeft;
6865         final int padding = getCompoundPaddingLeft() +
... getCompoundPaddingRight();
6866         final float dx = mLayout.getLineRight(0) - (width -
... padding);
6867         canvas.translate(layout.getParagraphDirection(0) * dx,
... 0.0f);
6868     }
6869
6870     if (mMarquee != null && mMarquee.isRunning()) {
6871         final float dx = -mMarquee.getScroll();
6872         canvas.translate(layout.getParagraphDirection(0) * dx,
... 0.0f);
6873     }
6874 }
6875
6876 final int cursorOffsetVertical = voffsetCursor - voffsetText;
6877
6878 Path highlight = getUpdatedHighlightPath();
6879 if (mEditor != null) {
6880     mEditor.onDraw(canvas, layout, highlight, mHighlightPaint,
... cursorOffsetVertical);
6881 } else {
6882     layout.draw(canvas, highlight, mHighlightPaint,
... cursorOffsetVertical);
6883 }
6884
6885 if (mMarquee != null && mMarquee.shouldDrawGhost()) {
6886     final float dx = mMarquee.getGhostOffset();
6887     canvas.translate(layout.getParagraphDirection(0) * dx,
```

```
6887... 0.0f);
6888         layout.draw(canvas, highlight, mHighlightPaint,
... cursorOffsetVertical);
6889     }
6890
6891     canvas.restore();
6892 }
6893
6894 @Override
6895 public void getFocusedRect(Rect r) {
6896     if (mLayout == null) {
6897         super.getFocusedRect(r);
6898         return;
6899     }
6900
6901     int selEnd = getSelectionEnd();
6902     if (selEnd < 0) {
6903         super.getFocusedRect(r);
6904         return;
6905     }
6906
6907     int selStart = getSelectionStart();
6908     if (selStart < 0 || selStart >= selEnd) {
6909         int line = mLayout.getLineForOffset(selEnd);
6910         r.top = mLayout.getLineTop(line);
6911         r.bottom = mLayout.getLineBottom(line);
6912         r.left = (int) mLayout.getPrimaryHorizontal(selEnd) - 2;
6913         r.right = r.left + 4;
6914     } else {
6915         int lineStart = mLayout.getLineForOffset(selStart);
6916         int lineEnd = mLayout.getLineForOffset(selEnd);
6917         r.top = mLayout.getLineTop(lineStart);
6918         r.bottom = mLayout.getLineBottom(lineEnd);
6919         if (lineStart == lineEnd) {
6920             r.left = (int) mLayout.getPrimaryHorizontal(selStart);
6921             r.right = (int) mLayout.getPrimaryHorizontal(selEnd);
6922         } else {
6923             // Selection extends across multiple lines -- make the
... focused
6924             // rect cover the entire width.
6925             if (mHighlightPathBogus) {
6926                 if (mHighlightPath == null) mHighlightPath = new
... Path();
6927                 mHighlightPath.reset();
6928                 mLayout.getSelectionPath(selStart, selEnd,
... mHighlightPath);
6929                 mHighlightPathBogus = false;
6930             }
6931             synchronized (TEMP_RECTF) {
6932                 mHighlightPath.computeBounds(TEMP_RECTF, true);
```

```

6933         r.left = (int) TEMP_RECTF.left - 1;
6934         r.right = (int) TEMP_RECTF.right + 1;
6935     }
6936 }
6937 }
6938
6939 // Adjust for padding and gravity.
6940 int paddingLeft = getCompoundPaddingLeft();
6941 int paddingTop = getExtendedPaddingTop();
6942 if ((mGravity & Gravity.VERTICAL_GRAVITY_MASK) != Gravity.TOP) {
6943     paddingTop += getVerticalOffset(false);
6944 }
6945 r.offset(paddingLeft, paddingTop);
6946 int paddingBottom = getExtendedPaddingBottom();
6947 r.bottom += paddingBottom;
6948 }
6949
6950 /**
6951  * Return the number of lines of text, or 0 if the internal Layout
... has not
6952  * been built.
6953  */
6954 public int getLineCount() {
6955     return mLayout != null ? mLayout.getLineCount() : 0;
6956 }
6957
6958 /**
6959  * Return the baseline for the specified line (0...getLineCount() -
... 1)
6960  * If bounds is not null, return the top, left, right, bottom
... extents
6961  * of the specified line in it. If the internal Layout has not been
... built,
6962  * return 0 and set bounds to (0, 0, 0, 0)
6963  * @param line which line to examine (0..getLineCount() - 1)
6964  * @param bounds Optional. If not null, it returns the extent of the
... line
6965  * @return the Y-coordinate of the baseline
6966  */
6967 public int getLineBounds(int line, Rect bounds) {
6968     if (mLayout == null) {
6969         if (bounds != null) {
6970             bounds.set(0, 0, 0, 0);
6971         }
6972         return 0;
6973     } else {
6974         int baseline = mLayout.getLineBounds(line, bounds);
6975
6976         int voffset = getExtendedPaddingTop();
6977         if ((mGravity & Gravity.VERTICAL_GRAVITY_MASK) !=

```

```
6977... Gravity.TOP) {
6978         voffset += getVerticalOffset(true);
6979     }
6980     if (bounds != null) {
6981         bounds.offset(getCompoundPaddingLeft(), voffset);
6982     }
6983     return baseline + voffset;
6984 }
6985 }
6986
6987 @Override
6988 public int getBaseline() {
6989     if (mLayout == null) {
6990         return super.getBaseline();
6991     }
6992
6993     return getBaselineOffset() + mLayout.getLineBaseline(0);
6994 }
6995
6996 int getBaselineOffset() {
6997     int voffset = 0;
6998     if ((mGravity & Gravity.VERTICAL_GRAVITY_MASK) != Gravity.TOP) {
6999         voffset = getVerticalOffset(true);
7000     }
7001
7002     if (isLayoutModeOptical(mParent)) {
7003         voffset -= getOpticalInsets().top;
7004     }
7005
7006     return getExtendedPaddingTop() + voffset;
7007 }
7008
7009 /**
7010  * @hide
7011  */
7012 @Override
7013 protected int getFadeTop(boolean offsetRequired) {
7014     if (mLayout == null) return 0;
7015
7016     int voffset = 0;
7017     if ((mGravity & Gravity.VERTICAL_GRAVITY_MASK) != Gravity.TOP) {
7018         voffset = getVerticalOffset(true);
7019     }
7020
7021     if (offsetRequired) voffset += getTopPaddingOffset();
7022
7023     return getExtendedPaddingTop() + voffset;
7024 }
7025
7026 /**
```

```
7027     * @hide
7028     */
7029     @Override
7030     protected int getFadeHeight(boolean offsetRequired) {
7031         return mLayout != null ? mLayout.getHeight() : 0;
7032     }
7033
7034     @Override
7035     public PointerIcon onResolvePointerIcon(MotionEvent event, int
... pointerIndex) {
7036         if (mText instanceof Spannable && mLinksClickable) {
7037             final float x = event.getX(pointerIndex);
7038             final float y = event.getY(pointerIndex);
7039             final int offset = getOffsetForPosition(x, y);
7040             final ClickableSpan[] clickables = ((Spannable)
... mText).getSpans(offset, offset,
7041                 ClickableSpan.class);
7042             if (clickables.length > 0) {
7043                 return PointerIcon.getSystemIcon(mContext,
... PointerIcon.TYPE_HAND);
7044             }
7045         }
7046         if (isTextSelectable() || isTextEditable()) {
7047             return PointerIcon.getSystemIcon(mContext,
... PointerIcon.TYPE_TEXT);
7048         }
7049         return super.onResolvePointerIcon(event, pointerIndex);
7050     }
7051
7052     @Override
7053     public boolean onKeyPreIme(int keyCode, KeyEvent event) {
7054         // Note: If the IME is in fullscreen mode and
... IMS#mExtractEditText is in text action mode,
7055         // InputMethodService#onKeyDown and InputMethodService#onKeyUp
are responsible to call
...
7056         //
... InputMethodService#mExtractEditText.maybeHandleBackInTextActionMode(
... event).
7057         if (keyCode == KeyEvent.KEYCODE_BACK &&
... handleBackInTextActionModeIfNeeded(event)) {
7058             return true;
7059         }
7060         return super.onKeyPreIme(keyCode, event);
7061     }
7062
7063     /**
7064     * @hide
7065     */
7066     public boolean handleBackInTextActionModeIfNeeded(KeyEvent event) {
7067         // Do nothing unless mEditor is in text action mode.
```

```
7068     if (mEditor == null || mEditor.getTextActionMode() == null) {
7069         return false;
7070     }
7071
7072     if (event.getAction() == KeyEvent.ACTION_DOWN &&
... event.getRepeatCount() == 0) {
7073         KeyEvent.DispatcherState state = getKeyDispatcherState();
7074         if (state != null) {
7075             state.startTracking(event, this);
7076         }
7077         return true;
7078     } else if (event.getAction() == KeyEvent.ACTION_UP) {
7079         KeyEvent.DispatcherState state = getKeyDispatcherState();
7080         if (state != null) {
7081             state.handleUpEvent(event);
7082         }
7083         if (event.isTracking() && !event.isCanceled()) {
7084             stopTextActionMode();
7085             return true;
7086         }
7087     }
7088     return false;
7089 }
7090
7091 @Override
7092 public boolean onKeyDown(int keyCode, KeyEvent event) {
7093     final int which = doKeyDown(keyCode, event, null);
7094     if (which == KEY_EVENT_NOT_HANDLED) {
7095         return super.onKeyDown(keyCode, event);
7096     }
7097
7098     return true;
7099 }
7100
7101 @Override
7102 public boolean onKeyMultiple(int keyCode, int repeatCount, KeyEvent
... event) {
7103     KeyEvent down = KeyEvent.changeAction(event,
... KeyEvent.ACTION_DOWN);
7104     final int which = doKeyDown(keyCode, down, event);
7105     if (which == KEY_EVENT_NOT_HANDLED) {
7106         // Go through default dispatching.
7107         return super.onKeyMultiple(keyCode, repeatCount, event);
7108     }
7109     if (which == KEY_EVENT_HANDLED) {
7110         // Consumed the whole thing.
7111         return true;
7112     }
7113
7114     repeatCount--;
```

```
7115
7116     // We are going to dispatch the remaining events to either the
... input
7117     // or movement method. To do this, we will just send a repeated
... stream
7118     // of down and up events until we have done the complete
... repeatCount.
7119     // It would be nice if those interfaces had an onKeyDownMultiple()
... method,
7120     // but adding that is a more complicated change.
7121     KeyEvent up = KeyEvent.changeAction(event, KeyEvent.ACTION_UP);
7122     if (which == KEY_DOWN_HANDLED_BY_KEY_LISTENER) {
7123         // mEditor and mEditor.mInput are not null from doKeyDown
7124         mEditor.mKeyListener.onKeyUp(this, (Editable) mText,
... keyCode, up);
7125         while (--repeatCount > 0) {
7126             mEditor.mKeyListener.onKeyDown(this, (Editable) mText,
... keyCode, down);
7127             mEditor.mKeyListener.onKeyUp(this, (Editable) mText,
... keyCode, up);
7128         }
7129         hideErrorIfUnchanged();
7130
7131     } else if (which == KEY_DOWN_HANDLED_BY_MOVEMENT_METHOD) {
7132         // mMovement is not null from doKeyDown
7133         mMovement.onKeyUp(this, (Spannable) mText, keyCode, up);
7134         while (--repeatCount > 0) {
7135             mMovement.onKeyDown(this, (Spannable) mText, keyCode,
... down);
7136             mMovement.onKeyUp(this, (Spannable) mText, keyCode, up);
7137         }
7138     }
7139
7140     return true;
7141 }
7142
7143 /**
7144  * Returns true if pressing ENTER in this field advances focus
... instead
7145  * of inserting the character. This is true mostly in single-line
... fields,
7146  * but also in mail addresses and subjects which will display on
... multiple
7147  * lines but where it doesn't make sense to insert newlines.
7148  */
7149 private boolean shouldAdvanceFocusOnEnter() {
7150     if (getKeyListener() == null) {
7151         return false;
7152     }
7153
```



```
7154     if (mSingleLine) {
7155         return true;
7156     }
7157
7158     if (mEditor != null
7159         && (mEditor.mInputType & EditorInfo.TYPE_MASK_CLASS)
7160         == EditorInfo.TYPE_CLASS_TEXT) {
7161         int variation = mEditor.mInputType &
... EditorInfo.TYPE_MASK_VARIATION;
7162         if (variation ==
... EditorInfo.TYPE_TEXT_VARIATION_EMAIL_ADDRESS
7163             || variation ==
... EditorInfo.TYPE_TEXT_VARIATION_EMAIL_SUBJECT) {
7164             return true;
7165         }
7166     }
7167
7168     return false;
7169 }
7170
7171 /**
7172  * Returns true if pressing TAB in this field advances focus instead
7173  * of inserting the character.  Insert tabs only in multi-line
... editors.
7174  */
7175 private boolean shouldAdvanceFocusOnTab() {
7176     if (getKeyListener() != null && !mSingleLine && mEditor != null
7177         && (mEditor.mInputType & EditorInfo.TYPE_MASK_CLASS)
7178         == EditorInfo.TYPE_CLASS_TEXT) {
7179         int variation = mEditor.mInputType &
... EditorInfo.TYPE_MASK_VARIATION;
7180         if (variation == EditorInfo.TYPE_TEXT_FLAG_IME_MULTI_LINE
7181             || variation ==
... EditorInfo.TYPE_TEXT_FLAG_MULTI_LINE) {
7182             return false;
7183         }
7184     }
7185     return true;
7186 }
7187
7188 private boolean isDirectionalNavigationKey(int keyCode) {
7189     switch(keyCode) {
7190         case KeyEvent.KEYCODE_DPAD_UP:
7191         case KeyEvent.KEYCODE_DPAD_DOWN:
7192         case KeyEvent.KEYCODE_DPAD_LEFT:
7193         case KeyEvent.KEYCODE_DPAD_RIGHT:
7194             return true;
7195     }
7196     return false;
7197 }
```

```
7198
7199     private int doKeyDown(int keyCode, KeyEvent event, KeyEvent
... otherEvent) {
7200         if (!isEnabled()) {
7201             return KEY_EVENT_NOT_HANDLED;
7202         }
7203
7204         // If this is the initial keydown, we don't want to prevent a
... movement away from this view.
7205         // While this shouldn't be necessary because any time we're
... preventing default movement we
7206         // should be restricting the focus to remain within this view,
... thus we'll also receive
7207         // the key up event, occasionally key up events will get dropped
... and we don't want to
7208         // prevent the user from traversing out of this on the next key
... down.
7209         if (event.getRepeatCount() == 0 &&
... !KeyEvent.isModifierKey(keyCode)) {
7210             mPreventDefaultMovement = false;
7211         }
7212
7213         switch (keyCode) {
7214             case KeyEvent.KEYCODE_ENTER:
7215                 if (event.hasNoModifiers()) {
7216                     // When mInputContentType is set, we know that we
... are
7217                     // running in a "modern" cupcake environment, so
... don't need
7218                     // to worry about the application trying to capture
7219                     // enter key events.
7220                     if (mEditor != null && mEditor.mInputContentType !=
... null) {
7221                         // If there is an action listener, given them a
7222                         // chance to consume the event.
7223                         if
... (mEditor.mInputContentType.onEditorActionListener != null
7224                             &&
... mEditor.mInputContentType.onEditorActionListener.onEditorAction(
7225                             this, EditorInfo.IME_NULL,
... event)) {
7226                             mEditor.mInputContentType.enterDown = true;
7227                             // We are consuming the enter key for them.
7228                             return KEY_EVENT_HANDLED;
7229                         }
7230                     }
7231
7232                     // If our editor should move focus when enter is
... pressed, or
7233                     // this is a generated event from an IME action
```

```
7233... button, then
7234         // don't let it be inserted into the text.
7235         if ((event.getFlags() & KeyEvent.FLAG_EDITOR_ACTION)
... != 0
7236             || shouldAdvanceFocusOnEnter()) {
7237             if (hasOnClickListeners()) {
7238                 return KEY_EVENT_NOT_HANDLED;
7239             }
7240             return KEY_EVENT_HANDLED;
7241         }
7242     }
7243     break;
7244
7245     case KeyEvent.KEYCODE_DPAD_CENTER:
7246         if (event.hasNoModifiers()) {
7247             if (shouldAdvanceFocusOnEnter()) {
7248                 return KEY_EVENT_NOT_HANDLED;
7249             }
7250         }
7251         break;
7252
7253     case KeyEvent.KEYCODE_TAB:
7254         if (event.hasNoModifiers() ||
... event.hasModifiers(KeyEvent.META_SHIFT_ON)) {
7255             if (shouldAdvanceFocusOnTab()) {
7256                 return KEY_EVENT_NOT_HANDLED;
7257             }
7258         }
7259         break;
7260
7261         // Has to be done on key down (and not on key up) to
... correctly be intercepted.
7262     case KeyEvent.KEYCODE_BACK:
7263         if (mEditor != null && mEditor.getTextActionMode() !=
... null) {
7264             stopTextActionMode();
7265             return KEY_EVENT_HANDLED;
7266         }
7267         break;
7268
7269     case KeyEvent.KEYCODE_CUT:
7270         if (event.hasNoModifiers() && canCut()) {
7271             if (onTextContextMenuItem(ID_CUT)) {
7272                 return KEY_EVENT_HANDLED;
7273             }
7274         }
7275         break;
7276
7277     case KeyEvent.KEYCODE_COPY:
7278         if (event.hasNoModifiers() && canCopy()) {
```

```

7279         if (onTextContextMenuItem(ID_COPY)) {
7280             return KEY_EVENT_HANDLED;
7281         }
7282     }
7283     break;
7284
7285     case KeyEvent.KEYCODE_PASTE:
7286         if (event.hasNoModifiers() && canPaste()) {
7287             if (onTextContextMenuItem(ID_PASTE)) {
7288                 return KEY_EVENT_HANDLED;
7289             }
7290         }
7291         break;
7292     }
7293
7294     if (mEditor != null && mEditor.mKeyListener != null) {
7295         boolean doDown = true;
7296         if (otherEvent != null) {
7297             try {
7298                 beginBatchEdit();
7299                 final boolean handled =
... mEditor.mKeyListener.onKeyOther(this, (Editable) mText,
7300                     otherEvent);
7301                 hideErrorIfUnchanged();
7302                 doDown = false;
7303                 if (handled) {
7304                     return KEY_EVENT_HANDLED;
7305                 }
7306             } catch (AbstractMethodError e) {
7307                 // onKeyOther was added after 1.0, so if it isn't
7308                 // implemented we need to try to dispatch as a
... regular down.
7309             } finally {
7310                 endBatchEdit();
7311             }
7312         }
7313
7314         if (doDown) {
7315             beginBatchEdit();
7316             final boolean handled =
... mEditor.mKeyListener.onKeyDown(this, (Editable) mText,
7317                 keyCode, event);
7318             endBatchEdit();
7319             hideErrorIfUnchanged();
7320             if (handled) return KEY_DOWN_HANDLED_BY_KEY_LISTENER;
7321         }
7322     }
7323
7324     // bug 650865: sometimes we get a key event before a layout.
7325     // don't try to move around if we don't know the layout.

```

```
7326
7327     if (mMovement != null && mLayout != null) {
7328         boolean doDown = true;
7329         if (otherEvent != null) {
7330             try {
7331                 boolean handled = mMovement.onKeyOther(this,
7332 (Spannable) mText,
7333                 otherEvent);
7334                 doDown = false;
7335                 if (handled) {
7336                     return KEY_EVENT_HANDLED;
7337                 }
7338             } catch (AbstractMethodError e) {
7339                 // onKeyOther was added after 1.0, so if it isn't
7340                 // implemented we need to try to dispatch as a
7341                 regular down.
7342             }
7343         }
7344         if (doDown) {
7345             if (mMovement.onKeyDown(this, (Spannable) mText,
7346 keyCode, event)) {
7347                 if (event.getRepeatCount() == 0 &&
7348 !KeyEvent.isModifierKey(keyCode)) {
7349                     mPreventDefaultMovement = true;
7350                 }
7351                 return KEY_DOWN_HANDLED_BY_MOVEMENT_METHOD;
7352             }
7353             // Consume arrows from keyboard devices to prevent focus
7354             // leaving the editor.
7355             // DPAD/JOY devices (Gamepads, TV remotes) often lack a TAB
7356             // key so allow those
7357             // to move focus with arrows.
7358             if (event.getSource() == InputDevice.SOURCE_KEYBOARD
7359                 && isDirectionalNavigationKey(keyCode)) {
7360                 return KEY_EVENT_HANDLED;
7361             }
7362         }
7363         return mPreventDefaultMovement &&
7364 !KeyEvent.isModifierKey(keyCode)
7365             ? KEY_EVENT_HANDLED : KEY_EVENT_NOT_HANDLED;
7366     }
7367
7368     /**
7369     * Resets the mErrorWasChanged flag, so that future calls to {@link
7370     * #setError(CharSequence)}
7371     * can be recorded.
7372     * @hide
7373     */
```

```

7368 public void resetErrorChangedFlag() {
7369     /*
7370     * Keep track of what the error was before doing the input
7371     * so that if an input filter changed the error, we leave
7372     * that error showing. Otherwise, we take down whatever
7373     * error was showing when the user types something.
7374     */
7375     if (mEditor != null) mEditor.mErrorWasChanged = false;
7376 }
7377
7378 /**
7379  * @hide
7380  */
7381 public void hideErrorIfUnchanged() {
7382     if (mEditor != null && mEditor.mError != null &&
... !mEditor.mErrorWasChanged) {
7383         setError(null, null);
7384     }
7385 }
7386
7387 @Override
7388 public boolean onKeyUp(int keyCode, KeyEvent event) {
7389     if (!isEnabled()) {
7390         return super.onKeyUp(keyCode, event);
7391     }
7392
7393     if (!KeyEvent.isModifierKey(keyCode)) {
7394         mPreventDefaultMovement = false;
7395     }
7396
7397     switch (keyCode) {
7398         case KeyEvent.KEYCODE_DPAD_CENTER:
7399             if (event.hasNoModifiers()) {
7400                 /*
7401                 * If there is a click listener, just call through
... to
7402                 * super, which will invoke it.
7403                 *
7404                 * If there isn't a click listener, try to show the
... soft
7405                 * input method. (It will also
7406                 * call performClick(), but that won't do anything
... in
7407                 * this case.)
7408                 */
7409                 if (!hasOnClickListeners()) {
7410                     if (mMovement != null && mText instanceof
... Editable
7411                     && mLayout != null &&
... onCheckIsTextEditor()) {

```



```

7451         throw new
...     IllegalStateException("focus search returned a view "
7452         + "that wasn't able to take
...     focus!");
7453     }
7454
7455     /*
7456     * Return true because we handled the
...     key; super
7457     * will return false because there was
...     no click
7458     * listener.
7459     */
7460     super.onKeyUp(keyCode, event);
7461     return true;
7462 } else if ((event.getFlags()
7463     & KeyEvent.FLAG_EDITOR_ACTION) != 0)
... {
7464     // No target for next focus, but make
...     sure the IME
7465     // if this came from it.
7466     InputMethodManager imm =
...     InputMethodManager.peekInstance();
7467     if (imm != null && imm.isActive(this)) {
7468     imm.hideSoftInputFromWindow(getWindowToken(), 0);
7469     }
7470     }
7471     }
7472     }
7473     return super.onKeyUp(keyCode, event);
7474     }
7475     break;
7476     }
7477
7478     if (mEditor != null && mEditor.mKeyListener != null) {
7479     if (mEditor.mKeyListener.onKeyUp(this, (Editable) mText,
...     keyCode, event)) {
7480     return true;
7481     }
7482     }
7483
7484     if (mMovement != null && mLayout != null) {
7485     if (mMovement.onKeyUp(this, (Spannable) mText, keyCode,
...     event)) {
7486     return true;
7487     }
7488     }
7489
7490     return super.onKeyUp(keyCode, event);

```



```
7491     }
7492
7493     @Override
7494     public boolean onCheckIsTextEditor() {
7495         return mEditor != null && mEditor.mInputType !=
... EditorInfo.TYPE_NULL;
7496     }
7497
7498     @Override
7499     public InputConnection onCreateInputConnection(EditorInfo outAttrs)
... {
7500         if (onCheckIsTextEditor() && isEnabled()) {
7501             mEditor.createInputMethodStateIfNeeded();
7502             outAttrs.inputType = getInputType();
7503             if (mEditor.mInputContentType != null) {
7504                 outAttrs.imeOptions =
... mEditor.mInputContentType.imeOptions;
7505                 outAttrs.privateImeOptions =
... mEditor.mInputContentType.privateImeOptions;
7506                 outAttrs.actionLabel =
... mEditor.mInputContentType.imeActionLabel;
7507                 outAttrs.actionId =
... mEditor.mInputContentType.imeActionId;
7508                 outAttrs.extras = mEditor.mInputContentType.extras;
7509                 outAttrs.hintLocales =
... mEditor.mInputContentType.imeHintLocales;
7510             } else {
7511                 outAttrs.imeOptions = EditorInfo.IME_NULL;
7512                 outAttrs.hintLocales = null;
7513             }
7514             if (focusSearch(FOCUS_DOWN) != null) {
7515                 outAttrs.imeOptions |=
... EditorInfo.IME_FLAG_NAVIGATE_NEXT;
7516             }
7517             if (focusSearch(FOCUS_UP) != null) {
7518                 outAttrs.imeOptions |=
... EditorInfo.IME_FLAG_NAVIGATE_PREVIOUS;
7519             }
7520             if ((outAttrs.imeOptions & EditorInfo.IME_MASK_ACTION)
7521                 == EditorInfo.IME_ACTION_UNSPECIFIED) {
7522                 if ((outAttrs.imeOptions &
... EditorInfo.IME_FLAG_NAVIGATE_NEXT) != 0) {
7523                     // An action has not been set, but the enter key
... will move to
7524                     // the next focus, so set the action to that.
7525                     outAttrs.imeOptions |= EditorInfo.IME_ACTION_NEXT;
7526                 } else {
7527                     // An action has not been set, and there is no focus
... to move
7528                     // to, so let's just supply a "done" action.
```

```
7529         outAttrs.imeOptions |= EditorInfo.IME_ACTION_DONE;
7530     }
7531     if (!shouldAdvanceFocusOnEnter()) {
7532         outAttrs.imeOptions |=
... EditorInfo.IME_FLAG_NO_ENTER_ACTION;
7533     }
7534 }
7535 if (isMultilineInputType(outAttrs.inputType)) {
7536     // Multi-line text editors should always show an enter
... key.
7537     outAttrs.imeOptions |=
... EditorInfo.IME_FLAG_NO_ENTER_ACTION;
7538 }
7539 outAttrs.hintText = mHint;
7540 if (mText instanceof Editable) {
7541     InputConnection ic = new EditableInputConnection(this);
7542     outAttrs.initialSelStart = getSelectionStart();
7543     outAttrs.initialSelEnd = getSelectionEnd();
7544     outAttrs.initialCapsMode =
... ic.getCursorCapsMode(getInputType());
7545     return ic;
7546 }
7547 }
7548 return null;
7549 }
7550
7551 /**
7552  * If this TextView contains editable content, extract a portion of
... it
7553  * based on the information in <var>request</var> in to
... <var>outText</var>.
7554  * @return Returns true if the text was successfully extracted, else
... false.
7555  */
7556 public boolean extractText(ExtractedTextRequest request,
... ExtractedText outText) {
7557     createEditorIfNeeded();
7558     return mEditor.extractText(request, outText);
7559 }
7560
7561 /**
7562  * This is used to remove all style-impacting spans from text before
... new
7563  * extracted text is being replaced into it, so that we don't have
... any
7564  * lingering spans applied during the replace.
7565  */
7566 static void removeParcelableSpans(Spannable spannable, int start,
... int end) {
7567     Object[] spans = spannable.getSpans(start, end,
```

```

7567... ParcelableSpan.class);
7568     int i = spans.length;
7569     while (i > 0) {
7570         i--;
7571         spannable.removeSpan(spans[i]);
7572     }
7573 }
7574
7575 /**
7576  * Apply to this text view the given extracted text, as previously
7577  * returned by {@link #extractText(ExtractedTextRequest,
... ExtractedText)}.
7578  */
7579 public void setExtractedText(ExtractedText text) {
7580     Editable content = getEditableText();
7581     if (text.text != null) {
7582         if (content == null) {
7583             setText(text.text, TextView.BufferType.EDITABLE);
7584         } else {
7585             int start = 0;
7586             int end = content.length();
7587
7588             if (text.partialStartOffset >= 0) {
7589                 final int N = content.length();
7590                 start = text.partialStartOffset;
7591                 if (start > N) start = N;
7592                 end = text.partialEndOffset;
7593                 if (end > N) end = N;
7594             }
7595
7596             removeParcelableSpans(content, start, end);
7597             if (TextUtils.equals(content.subSequence(start, end),
... text.text)) {
7598                 if (text.text instanceof Spanned) {
7599                     // OK to copy spans only.
7600                     TextUtils.copySpansFrom((Spanned) text.text, 0,
... end - start,
7601                                     Object.class, content, start);
7602                 }
7603             } else {
7604                 content.replace(start, end, text.text);
7605             }
7606         }
7607     }
7608
7609     // Now set the selection position... make sure it is in range,
... to
7610     // avoid crashes. If this is a partial update, it is possible
... that
7611     // the underlying text may have changed, causing us problems

```

```

7611... here.
7612         // Also we just don't want to trust clients to do the right
... thing.
7613         Spannable sp = (Spannable) getText();
7614         final int N = sp.length();
7615         int start = text.selectionStart;
7616         if (start < 0) {
7617             start = 0;
7618         } else if (start > N) {
7619             start = N;
7620         }
7621         int end = text.selectionEnd;
7622         if (end < 0) {
7623             end = 0;
7624         } else if (end > N) {
7625             end = N;
7626         }
7627         Selection.setSelection(sp, start, end);
7628
7629         // Finally, update the selection mode.
7630         if ((text.flags & ExtractedText.FLAG_SELECTING) != 0) {
7631             MetaKeyListener.startSelecting(this, sp);
7632         } else {
7633             MetaKeyListener.stopSelecting(this, sp);
7634         }
7635     }
7636
7637     /**
7638     * @hide
7639     */
7640     public void setExtracting(ExtractedTextRequest req) {
7641         if (mEditor.mInputMethodState != null) {
7642             mEditor.mInputMethodState.mExtractedTextRequest = req;
7643         }
7644         // This would stop a possible selection mode, but no such mode
... is started in case
7645         // extracted mode will start. Some text is selected though, and
... will trigger an action mode
7646         // in the extracted view.
7647         mEditor.hideCursorAndSpanControllers();
7648         stopTextActionMode();
7649         if (mEditor.mSelectionModifierCursorController != null) {
7650             mEditor.mSelectionModifierCursorController.resetTouchOffsets();
7651         }
7652     }
7653
7654     /**
7655     * Called by the framework in response to a text completion from
7656     * the current input method, provided by it calling

```

```
7657 * {@link InputConnection#commitCompletion
7658 * InputConnection.commitCompletion()}. The default implementation
... does
7659 * nothing; text views that are supporting auto-completion should
... override
7660 * this to do their desired behavior.
7661 *
7662 * @param text The auto complete text the user has selected.
7663 */
7664 public void onCommitCompletion(CompletionInfo text) {
7665     // intentionally empty
7666 }
7667
7668 /**
7669 * Called by the framework in response to a text auto-correction
... (such as fixing a typo using a
7670 * dictionary) from the current input method, provided by it calling
7671 * {@link InputConnection#commitCorrection(CorrectionInfo)
... InputConnection.commitCorrection()}.
7672 * The default implementation flashes the background of the
... corrected word to provide
7673 * feedback to the user.
7674 *
7675 * @param info The auto correct info about the text that was
... corrected.
7676 */
7677 public void onCommitCorrection(CorrectionInfo info) {
7678     if (mEditor != null) mEditor.onCommitCorrection(info);
7679 }
7680
7681 public void beginBatchEdit() {
7682     if (mEditor != null) mEditor.beginBatchEdit();
7683 }
7684
7685 public void endBatchEdit() {
7686     if (mEditor != null) mEditor.endBatchEdit();
7687 }
7688
7689 /**
7690 * Called by the framework in response to a request to begin a batch
7691 * of edit operations through a call to link {@link
... #beginBatchEdit()}.
7692 */
7693 public void onBeginBatchEdit() {
7694     // intentionally empty
7695 }
7696
7697 /**
7698 * Called by the framework in response to a request to end a batch
7699 * of edit operations through a call to link {@link #endBatchEdit}.
```

```
7700 */
7701 public void onEndBatchEdit() {
7702     // intentionally empty
7703 }
7704
7705 /**
7706  * Called by the framework in response to a private command from the
7707  * current method, provided by it calling
7708  * {@link InputConnection#performPrivateCommand
7709  * InputConnection.performPrivateCommand()}.
7710  *
7711  * @param action The action name of the command.
7712  * @param data Any additional data for the command. This may be
7713  * ... null.
7714  * @return Return true if you handled the command, else false.
7715  */
7716 public boolean onPrivateIMECommand(String action, Bundle data) {
7717     return false;
7718 }
7719
7720 private void nullLayouts() {
7721     if (mLayout instanceof BoringLayout && mSavedLayout == null) {
7722         mSavedLayout = (BoringLayout) mLayout;
7723     }
7724     if (mHintLayout instanceof BoringLayout && mSavedHintLayout ==
7725     ... null) {
7726         mSavedHintLayout = (BoringLayout) mHintLayout;
7727     }
7728
7729     mSavedMarqueeModeLayout = mLayout = mHintLayout = null;
7730
7731     mBoring = mHintBoring = null;
7732
7733     // Since it depends on the value of mLayout
7734     if (mEditor != null) mEditor.prepareCursorControllers();
7735 }
7736
7737 /**
7738  * Make a new Layout based on the already-measured size of the view,
7739  * on the assumption that it was measured correctly at some point.
7740  */
7741 private void assumeLayout() {
7742     int width = mRight - mLeft - getCompoundPaddingLeft() -
7743     ... getCompoundPaddingRight();
7744
7745     if (width < 1) {
7746         width = 0;
7747     }
7748
7749     int physicalWidth = width;
```

```
7747
7748     if (mHorizontallyScrolling) {
7749         width = VERY_WIDE;
7750     }
7751
7752     makeNewLayout(width, physicalWidth, UNKNOWN_BORING,
... UNKNOWN_BORING,
7753         physicalWidth, false);
7754 }
7755
7756 private Layout.Alignment getLayoutAlignment() {
7757     Layout.Alignment alignment;
7758     switch (getTextAlignment()) {
7759         case TEXT_ALIGNMENT_GRAVITY:
7760             switch (mGravity &
... Gravity.RELATIVE_HORIZONTAL_GRAVITY_MASK) {
7761                 case Gravity.START:
7762                     alignment = Layout.Alignment.ALIGN_NORMAL;
7763                     break;
7764                 case Gravity.END:
7765                     alignment = Layout.Alignment.ALIGN_OPPOSITE;
7766                     break;
7767                 case Gravity.LEFT:
7768                     alignment = Layout.Alignment.ALIGN_LEFT;
7769                     break;
7770                 case Gravity.RIGHT:
7771                     alignment = Layout.Alignment.ALIGN_RIGHT;
7772                     break;
7773                 case Gravity.CENTER_HORIZONTAL:
7774                     alignment = Layout.Alignment.ALIGN_CENTER;
7775                     break;
7776                 default:
7777                     alignment = Layout.Alignment.ALIGN_NORMAL;
7778                     break;
7779             }
7780             break;
7781         case TEXT_ALIGNMENT_TEXT_START:
7782             alignment = Layout.Alignment.ALIGN_NORMAL;
7783             break;
7784         case TEXT_ALIGNMENT_TEXT_END:
7785             alignment = Layout.Alignment.ALIGN_OPPOSITE;
7786             break;
7787         case TEXT_ALIGNMENT_CENTER:
7788             alignment = Layout.Alignment.ALIGN_CENTER;
7789             break;
7790         case TEXT_ALIGNMENT_VIEW_START:
7791             alignment = (getLayoutDirection() ==
... LAYOUT_DIRECTION_RTL)
7792                 ? Layout.Alignment.ALIGN_RIGHT :
... Layout.Alignment.ALIGN_LEFT;
```

```
7793         break;
7794     case TEXT_ALIGNMENT_VIEW_END:
7795         alignment = (getLayoutDirection() ==
... LAYOUT_DIRECTION_RTL)
7796             ? Layout.Alignment.ALIGN_LEFT :
... Layout.Alignment.ALIGN_RIGHT;
7797         break;
7798     case TEXT_ALIGNMENT_INHERIT:
7799         // This should never happen as we have already resolved
... the text alignment
7800         // but better safe than sorry so we just fall through
7801         default:
7802             alignment = Layout.Alignment.ALIGN_NORMAL;
7803             break;
7804     }
7805     return alignment;
7806 }
7807
7808 /**
7809  * The width passed in is now the desired layout width,
7810  * not the full view width with padding.
7811  * {@hide}
7812  */
7813 protected void makeNewLayout(int wantWidth, int hintWidth,
7814                             BoringLayout.Metrics boring,
7815                             BoringLayout.Metrics hintBoring,
7816                             int ellipsisWidth, boolean
... bringIntoView) {
7817     stopMarquee();
7818
7819     // Update "old" cached values
7820     mOldMaximum = mMaximum;
7821     mOldMaxMode = mMaxMode;
7822
7823     mHighlightPathBogus = true;
7824
7825     if (wantWidth < 0) {
7826         wantWidth = 0;
7827     }
7828     if (hintWidth < 0) {
7829         hintWidth = 0;
7830     }
7831
7832     Layout.Alignment alignment = getLayoutAlignment();
7833     final boolean testDirChange = mSingleLine && mLayout != null
7834         && (alignment == Layout.Alignment.ALIGN_NORMAL
7835             || alignment ==
... Layout.Alignment.ALIGN_OPPOSITE);
7836     int oldDir = 0;
7837     if (testDirChange) oldDir = mLayout.getParagraphDirection(0);
```



```
7838     boolean shouldEllipsize = mEllipsize != null && getKeyListener()
... == null;
7839     final boolean switchEllipsize = mEllipsize == TruncateAt.MARQUEE
7840         && mMarqueeFadeMode != MARQUEE_FADE_NORMAL;
7841     TruncateAt effectiveEllipsize = mEllipsize;
7842     if (mEllipsize == TruncateAt.MARQUEE
7843         && mMarqueeFadeMode ==
... MARQUEE_FADE_SWITCH_SHOW_ELLIPSIS) {
7844         effectiveEllipsize = TruncateAt.END_SMALL;
7845     }
7846
7847     if (mTextDir == null) {
7848         mTextDir = getTextDirectionHeuristic();
7849     }
7850
7851     mLayout = makeSingleLayout(wantWidth, boring, ellipsisWidth,
... alignment, shouldEllipsize,
7852         effectiveEllipsize, effectiveEllipsize == mEllipsize);
7853     if (switchEllipsize) {
7854         TruncateAt oppositeEllipsize = effectiveEllipsize ==
... TruncateAt.MARQUEE
7855             ? TruncateAt.END : TruncateAt.MARQUEE;
7856         mSavedMarqueeModeLayout = makeSingleLayout(wantWidth,
... boring, ellipsisWidth, alignment,
7857             shouldEllipsize, oppositeEllipsize,
... effectiveEllipsize != mEllipsize);
7858     }
7859
7860     shouldEllipsize = mEllipsize != null;
7861     mHintLayout = null;
7862
7863     if (mHint != null) {
7864         if (shouldEllipsize) hintWidth = wantWidth;
7865
7866         if (hintBoring == UNKNOWN_BORING) {
7867             hintBoring = BoringLayout.isBoring(mHint, mTextPaint,
... mTextDir,
7868                 mHintBoring);
7869
7870             if (hintBoring != null) {
7871                 mHintBoring = hintBoring;
7872             }
7873
7874             if (hintBoring != null) {
7875                 if (hintBoring.width <= hintWidth
7876                     && (!shouldEllipsize || hintBoring.width <=
... ellipsisWidth)) {
7877                     if (mSavedHintLayout != null) {
7878                         mHintLayout =
... mSavedHintLayout.replaceOrMake(mHint, mTextPaint,
```

```

7879         hintWidth, alignment, mSpacingMult,
... mSpacingAdd,
7880         hintBoring, mIncludePad);
7881     } else {
7882         mHintLayout = BoringLayout.make(mHint,
... mTextPaint,
7883         hintWidth, alignment, mSpacingMult,
... mSpacingAdd,
7884         hintBoring, mIncludePad);
7885     }
7886
7887     mSavedHintLayout = (BoringLayout) mHintLayout;
7888     } else if (shouldEllipsize && hintBoring.width <=
... hintWidth) {
7889         if (mSavedHintLayout != null) {
7890             mHintLayout =
... mSavedHintLayout.replaceOrMake(mHint, mTextPaint,
7891             hintWidth, alignment, mSpacingMult,
... mSpacingAdd,
7892             hintBoring, mIncludePad, mEllipsize,
7893             ellipsisWidth);
7894         } else {
7895             mHintLayout = BoringLayout.make(mHint,
... mTextPaint,
7896             hintWidth, alignment, mSpacingMult,
... mSpacingAdd,
7897             hintBoring, mIncludePad, mEllipsize,
7898             ellipsisWidth);
7899         }
7900     }
7901 }
7902 // TODO: code duplication with makeSingleLayout()
7903 if (mHintLayout == null) {
7904     StaticLayout.Builder builder =
... StaticLayout.Builder.obtain(mHint, 0,
7905     mHint.length(), mTextPaint, hintWidth)
7906     .setAlignment(alignment)
7907     .setTextDirection(mTextDir)
7908     .setLineSpacing(mSpacingAdd, mSpacingMult)
7909     .setIncludePad(mIncludePad)
7910     .setBreakStrategy(mBreakStrategy)
7911     .setHyphenationFrequency(mHyphenationFrequency)
7912     .setJustificationMode(mJustificationMode)
7913     .setMaxLines(mMaxMode == LINES ? mMaximum :
... Integer.MAX_VALUE);
7914     if (shouldEllipsize) {
7915         builder.setEllipsize(mEllipsize)
7916             .setEllipsizedWidth(ellipsisWidth);
7917     }
7918     mHintLayout = builder.build();

```

```
7919     }
7920     }
7921
7922     if (bringIntoView || (testDirChange && oldDir !=
... mLayout.getParagraphDirection(0))) {
7923         registerForPreDraw();
7924     }
7925
7926     if (mEllipsize == TextUtils.TruncateAt.MARQUEE) {
7927         if (!compressText(ellipsisWidth)) {
7928             final int height = mLayoutParams.height;
7929             // If the size of the view does not depend on the size
... of the text, try to
7930             // start the marquee immediately
7931             if (height != LayoutParams.WRAP_CONTENT && height !=
... LayoutParams.MATCH_PARENT) {
7932                 startMarquee();
7933             } else {
7934                 // Defer the start of the marquee until we know our
... width (see setFrame())
7935                 mRestartMarquee = true;
7936             }
7937         }
7938     }
7939
7940     // CursorControllers need a non-null mLayout
7941     if (mEditor != null) mEditor.prepareCursorControllers();
7942 }
7943
7944 /**
7945  * @hide
7946  */
7947 protected Layout makeSingleLayout(int wantWidth,
... BoringLayout.Metrics boring, int ellipsisWidth,
7948     Layout.Alignment alignment, boolean shouldEllipsize,
... TruncateAt effectiveEllipsize,
7949     boolean useSaved) {
7950     Layout result = null;
7951     if (mText instanceof Spannable) {
7952         result = new DynamicLayout(mText, mTransformed, mTextPaint,
... wantWidth,
7953             alignment, mTextDir, mSpacingMult, mSpacingAdd,
... mIncludePad,
7954             mBreakStrategy, mHyphenationFrequency,
... mJustificationMode,
7955             getKeyListener() == null ? effectiveEllipsize :
... null, ellipsisWidth);
7956     } else {
7957         if (boring == UNKNOWN_BORING) {
7958             boring = BoringLayout.isBoring(mTransformed, mTextPaint,
```

```
7958... mTextDir, mBoring);
7959         if (boring != null) {
7960             mBoring = boring;
7961         }
7962     }
7963
7964     if (boring != null) {
7965         if (boring.width <= wantWidth
7966             && (effectiveEllipsize == null || boring.width
... <= ellipsisWidth)) {
7967             if (useSaved && mSavedLayout != null) {
7968                 result =
... mSavedLayout.replaceOrMake(mTransformed, mTextPaint,
7969                             wantWidth, alignment, mSpacingMult,
... mSpacingAdd,
7970                             boring, mIncludePad);
7971             } else {
7972                 result = BoringLayout.make(mTransformed,
... mTextPaint,
7973                             wantWidth, alignment, mSpacingMult,
... mSpacingAdd,
7974                             boring, mIncludePad);
7975             }
7976
7977             if (useSaved) {
7978                 mSavedLayout = (BoringLayout) result;
7979             }
7980         } else if (shouldEllipsize && boring.width <= wantWidth)
... {
7981             if (useSaved && mSavedLayout != null) {
7982                 result =
... mSavedLayout.replaceOrMake(mTransformed, mTextPaint,
7983                             wantWidth, alignment, mSpacingMult,
... mSpacingAdd,
7984                             boring, mIncludePad, effectiveEllipsize,
7985                             ellipsisWidth);
7986             } else {
7987                 result = BoringLayout.make(mTransformed,
... mTextPaint,
7988                             wantWidth, alignment, mSpacingMult,
... mSpacingAdd,
7989                             boring, mIncludePad, effectiveEllipsize,
7990                             ellipsisWidth);
7991             }
7992         }
7993     }
7994 }
7995 if (result == null) {
7996     StaticLayout.Builder builder =
... StaticLayout.Builder.obtain(mTransformed,
```

```
7997         0, mTransformed.length(), mTextPaint, wantWidth)
7998         .setAlignment(alignment)
7999         .setTextDirection(mTextDir)
8000         .setLineSpacing(mSpacingAdd, mSpacingMult)
8001         .setIncludePad(mIncludePad)
8002         .setBreakStrategy(mBreakStrategy)
8003         .setHyphenationFrequency(mHyphenationFrequency)
8004         .setJustificationMode(mJustificationMode)
8005         .setMaxLines(mMaxMode == LINES ? mMaximum :
... Integer.MAX_VALUE);
8006         if (shouldEllipsize) {
8007             builder.setEllipsize(effectiveEllipsize)
8008                 .setEllipsizedWidth(ellipsisWidth);
8009         }
8010         // TODO: explore always setting maxLines
8011         result = builder.build();
8012     }
8013     return result;
8014 }
8015
8016 private boolean compressText(float width) {
8017     if (isHardwareAccelerated()) return false;
8018
8019     // Only compress the text if it hasn't been compressed by the
... previous pass
8020     if (width > 0.0f && mLayout != null && getLineCount() == 1 &&
... !mUserSetTextScaleX
8021         && mTextPaint.getTextScaleX() == 1.0f) {
8022         final float textWidth = mLayout.getLineWidth(0);
8023         final float overflow = (textWidth + 1.0f - width) / width;
8024         if (overflow > 0.0f && overflow <=
... Marquee.MARQUEE_DELTA_MAX) {
8025             mTextPaint.setTextScaleX(1.0f - overflow - 0.005f);
8026             post(new Runnable() {
8027                 public void run() {
8028                     requestLayout();
8029                 }
8030             });
8031             return true;
8032         }
8033     }
8034
8035     return false;
8036 }
8037
8038 private static int desired(Layout layout) {
8039     int n = layout.getLineCount();
8040     CharSequence text = layout.getText();
8041     float max = 0;
8042
```

```
8043 // if any line was wrapped, we can't use it.
8044 // but it's ok for the last line not to have a newline
8045
8046 for (int i = 0; i < n - 1; i++) {
8047     if (text.charAt(layout.getLineEnd(i) - 1) != '\n') {
8048         return -1;
8049     }
8050 }
8051
8052 for (int i = 0; i < n; i++) {
8053     max = Math.max(max, layout.getLineWidth(i));
8054 }
8055
8056 return (int) Math.ceil(max);
8057 }
8058
8059 /**
8060  * Set whether the TextView includes extra top and bottom padding to
... make
8061  * room for accents that go above the normal ascent and descent.
8062  * The default is true.
8063  *
8064  * @see #getIncludeFontPadding()
8065  *
8066  * @attr ref android.R.styleable#TextView_includeFontPadding
8067  */
8068 public void setIncludeFontPadding(boolean includepad) {
8069     if (mIncludePad != includepad) {
8070         mIncludePad = includepad;
8071
8072         if (mLayout != null) {
8073             nullLayouts();
8074             requestLayout();
8075             invalidate();
8076         }
8077     }
8078 }
8079
8080 /**
8081  * Gets whether the TextView includes extra top and bottom padding
... to make
8082  * room for accents that go above the normal ascent and descent.
8083  *
8084  * @see #setIncludeFontPadding(boolean)
8085  *
8086  * @attr ref android.R.styleable#TextView_includeFontPadding
8087  */
8088 public boolean getIncludeFontPadding() {
8089     return mIncludePad;
8090 }
```

```
8091
8092     private static final BoringLayout.Metrics UNKNOWN_BORING = new
... BoringLayout.Metrics();
8093
8094     @Override
8095     protected void onMeasure(int widthMeasureSpec, int
... heightMeasureSpec) {
8096         int widthMode = MeasureSpec.getMode(widthMeasureSpec);
8097         int heightMode = MeasureSpec.getMode(heightMeasureSpec);
8098         int widthSize = MeasureSpec.getSize(widthMeasureSpec);
8099         int heightSize = MeasureSpec.getSize(heightMeasureSpec);
8100
8101         int width;
8102         int height;
8103
8104         BoringLayout.Metrics boring = UNKNOWN_BORING;
8105         BoringLayout.Metrics hintBoring = UNKNOWN_BORING;
8106
8107         if (mTextDir == null) {
8108             mTextDir = getTextDirectionHeuristic();
8109         }
8110
8111         int des = -1;
8112         boolean fromexisting = false;
8113
8114         if (widthMode == MeasureSpec.EXACTLY) {
8115             // Parent has told us how big to be. So be it.
8116             width = widthSize;
8117         } else {
8118             if (mLayout != null && mEllipsize == null) {
8119                 des = desired(mLayout);
8120             }
8121
8122             if (des < 0) {
8123                 boring = BoringLayout.isBoring(mTransformed, mTextPaint,
... mTextDir, mBoring);
8124                 if (boring != null) {
8125                     mBoring = boring;
8126                 }
8127             } else {
8128                 fromexisting = true;
8129             }
8130
8131             if (boring == null || boring == UNKNOWN_BORING) {
8132                 if (des < 0) {
8133                     des = (int)
... Math.ceil(Layout.getDesiredWidth(mTransformed, 0,
8134                                     mTransformed.length(), mTextPaint,
... mTextDir));
8135                 }

```

```
8136         width = des;
8137     } else {
8138         width = boring.width;
8139     }
8140
8141     final Drawables dr = mDrawables;
8142     if (dr != null) {
8143         width = Math.max(width, dr.mDrawableWidthTop);
8144         width = Math.max(width, dr.mDrawableWidthBottom);
8145     }
8146
8147     if (mHint != null) {
8148         int hintDes = -1;
8149         int hintWidth;
8150
8151         if (mHintLayout != null && mEllipsize == null) {
8152             hintDes = desired(mHintLayout);
8153         }
8154
8155         if (hintDes < 0) {
8156             hintBoring = BoringLayout.isBoring(mHint,
8157 ... mTextPaint, mTextDir, mHintBoring);
8158             if (hintBoring != null) {
8159                 mHintBoring = hintBoring;
8160             }
8161         }
8162
8163         if (hintBoring == null || hintBoring == UNKNOWN_BORING)
8164     {
8165             if (hintDes < 0) {
8166                 hintDes = (int)
8167 ... Math.ceil(Layout.getDesiredWidth(mHint, 0, mHint.length(),
8168 ... mTextPaint, mTextDir));
8169             }
8170             hintWidth = hintDes;
8171         } else {
8172             hintWidth = hintBoring.width;
8173         }
8174
8175         if (hintWidth > width) {
8176             width = hintWidth;
8177         }
8178     }
8179
8180     width += getCompoundPaddingLeft() +
8181 ... getCompoundPaddingRight();
8182
8183     if (mMaxWidthMode == EMS) {
8184         width = Math.min(width, mMaxWidth * getLineHeight());
8185     } else {
```



```
8182         width = Math.min(width, mMaxWidth);
8183     }
8184
8185     if (mMinWidthMode == EMS) {
8186         width = Math.max(width, mMinWidth * getLineHeight());
8187     } else {
8188         width = Math.max(width, mMinWidth);
8189     }
8190
8191     // Check against our minimum width
8192     width = Math.max(width, getSuggestedMinimumWidth());
8193
8194     if (widthMode == MeasureSpec.AT_MOST) {
8195         width = Math.min(widthSize, width);
8196     }
8197 }
8198
8199     int want = width - getCompoundPaddingLeft() -
... getCompoundPaddingRight();
8200     int unpaddedWidth = want;
8201
8202     if (mHorizontallyScrolling) want = VERY_WIDE;
8203
8204     int hintWant = want;
8205     int hintWidth = (mHintLayout == null) ? hintWant :
... mHintLayout.getWidth();
8206
8207     if (mLayout == null) {
8208         makeNewLayout(want, hintWant, boring, hintBoring,
8209             width - getCompoundPaddingLeft() -
... getCompoundPaddingRight(), false);
8210     } else {
8211         final boolean layoutChanged = (mLayout.getWidth() != want)
... || (hintWidth != hintWant)
8212             || (mLayout.getEllipsizedWidth()
8213                 != width - getCompoundPaddingLeft() -
... getCompoundPaddingRight());
8214
8215         final boolean widthChanged = (mHint == null) && (mEllipsize
... == null)
8216             && (want > mLayout.getWidth())
8217             && (mLayout instanceof BoringLayout
8218                 || (fromexisting && des >= 0 && des <=
... want));
8219
8220         final boolean maximumChanged = (mMaxMode != mOldMaxMode) ||
... (mMaximum != mOldMaximum);
8221
8222         if (layoutChanged || maximumChanged) {
8223             if (!maximumChanged && widthChanged) {
```

```
8224         mLayout.increaseWidthTo(want);
8225     } else {
8226         makeNewLayout(want, hintWant, boring, hintBoring,
8227             width - getCompoundPaddingLeft() -
... getCompoundPaddingRight(), false);
8228     }
8229 } else {
8230     // Nothing has changed
8231 }
8232 }
8233
8234 if (heightMode == MeasureSpec.EXACTLY) {
8235     // Parent has told us how big to be. So be it.
8236     height = heightSize;
8237     mDesiredHeightAtMeasure = -1;
8238 } else {
8239     int desired = getDesiredHeight();
8240
8241     height = desired;
8242     mDesiredHeightAtMeasure = desired;
8243
8244     if (heightMode == MeasureSpec.AT_MOST) {
8245         height = Math.min(desired, heightSize);
8246     }
8247 }
8248
8249     int unpaddedHeight = height - getCompoundPaddingTop() -
... getCompoundPaddingBottom();
8250     if (mMaxMode == LINES && mLayout.getLineCount() > mMaximum) {
8251         unpaddedHeight = Math.min(unpaddedHeight,
... mLayout.getLineTop(mMaximum));
8252     }
8253
8254     /*
8255     * We didn't let makeNewLayout() register to bring the cursor
... into view,
8256     * so do it here if there is any possibility that it is needed.
8257     */
8258     if (mMovement != null
8259         || mLayout.getWidth() > unpaddedWidth
8260         || mLayout.getHeight() > unpaddedHeight) {
8261         registerForPreDraw();
8262     } else {
8263         scrollTo(0, 0);
8264     }
8265
8266     setMeasuredDimension(width, height);
8267 }
8268
8269 /**
```

```
8270 * Automatically computes and sets the text size.
8271 */
8272 private void autoSizeText() {
8273     if (!isAutoSizeEnabled()) {
8274         return;
8275     }
8276
8277     if (mNeedsAutoSizeText) {
8278         if (getMeasuredWidth() <= 0 || getMeasuredHeight() <= 0) {
8279             return;
8280         }
8281
8282         final int availableWidth = mHorizontallyScrolling
8283             ? VERY_WIDE
8284             : getMeasuredWidth() - getTotalPaddingLeft() -
8285 ... getTotalPaddingRight();
8286         final int availableHeight = getMeasuredHeight() -
8287 ... getExtendedPaddingBottom()
8288         - getExtendedPaddingTop();
8289
8290         if (availableWidth <= 0 || availableHeight <= 0) {
8291             return;
8292         }
8293
8294         synchronized (TEMP_RECTF) {
8295             TEMP_RECTF.setEmpty();
8296             TEMP_RECTF.right = availableWidth;
8297             TEMP_RECTF.bottom = availableHeight;
8298             final float optimalTextSize =
8299 ... findLargestTextSizeWhichFits(TEMP_RECTF);
8300
8301             if (optimalTextSize != getTextSize()) {
8302                 setTextSizeInternal(TypedValue.COMPLEX_UNIT_PX,
8303 ... optimalTextSize,
8304 ... false /* shouldRequestLayout */);
8305
8306                 makeNewLayout(availableWidth, 0 /* hintWidth */,
8307 ... UNKNOWN_BORING, UNKNOWN_BORING,
8308 ... mRight - mLeft - getCompoundPaddingLeft() -
8309 ... getCompoundPaddingRight(),
8310 ... false /* bringIntoView */);
8311             }
8312         }
8313     }
8314
8315     // Always try to auto-size if enabled. Functions that do not
8316 ... want to trigger auto-sizing
8317     // after the next layout pass should set this to false.
8318     mNeedsAutoSizeText = true;
8319 }
8320
```

```
8313     /**
8314     * Performs a binary search to find the largest text size that will
... still fit within the size
8315     * available to this view.
8316     */
8317     private int findLargestTextSizeWhichFits(RectF availableSpace) {
8318         final int sizesCount = mAutoSizeTextSizesInPx.length;
8319         if (sizesCount == 0) {
8320             throw new IllegalStateException("No available text sizes to
... choose from.");
8321         }
8322
8323         int bestSizeIndex = 0;
8324         int lowIndex = bestSizeIndex + 1;
8325         int highIndex = sizesCount - 1;
8326         int sizeToTryIndex;
8327         while (lowIndex <= highIndex) {
8328             sizeToTryIndex = (lowIndex + highIndex) / 2;
8329             if
... (suggestedSizeFitsInSpace(mAutoSizeTextSizesInPx[sizeToTryIndex],
... availableSpace)) {
8330                 bestSizeIndex = lowIndex;
8331                 lowIndex = sizeToTryIndex + 1;
8332             } else {
8333                 highIndex = sizeToTryIndex - 1;
8334                 bestSizeIndex = highIndex;
8335             }
8336         }
8337
8338         return mAutoSizeTextSizesInPx[bestSizeIndex];
8339     }
8340
8341     private boolean suggestedSizeFitsInSpace(int suggestedSizeInPx,
... RectF availableSpace) {
8342         final CharSequence text = getText();
8343         final int maxLines = getMaxLines();
8344         if (mTempTextPaint == null) {
8345             mTempTextPaint = new TextPaint();
8346         } else {
8347             mTempTextPaint.reset();
8348         }
8349         mTempTextPaint.set(getPaint());
8350         mTempTextPaint.setTextSize(suggestedSizeInPx);
8351
8352         final StaticLayout.Builder layoutBuilder =
... StaticLayout.Builder.obtain(
8353             text, 0, text.length(), mTempTextPaint,
... Math.round(availableSpace.right));
8354
8355         layoutBuilder.setAlignment(getLayoutAlignment())
```

```
8356         .setLineSpacing(getLineSpacingExtra(),
...   getLineSpacingMultiplier())
8357         .setIncludePad(getIncludeFontPadding())
8358         .setBreakStrategy(getBreakStrategy())
8359         .setHyphenationFrequency(getHyphenationFrequency())
8360         .setJustificationMode(getJustificationMode())
8361         .setMaxLines(mMaxMode == LINES ? mMaximum :
...   Integer.MAX_VALUE)
8362         .setTextDirection(getTextDirectionHeuristic());
8363
8364         final StaticLayout layout = layoutBuilder.build();
8365
8366         // Lines overflow.
8367         if (maxLines != -1 && layout.getLineCount() > maxLines) {
8368             return false;
8369         }
8370
8371         // Height overflow.
8372         if (layout.getHeight() > availableSpace.bottom) {
8373             return false;
8374         }
8375
8376         return true;
8377     }
8378
8379     private int getDesiredHeight() {
8380         return Math.max(
8381             getDesiredHeight(mLayout, true),
8382             getDesiredHeight(mHintLayout, mEllipsize != null));
8383     }
8384
8385     private int getDesiredHeight(Layout layout, boolean cap) {
8386         if (layout == null) {
8387             return 0;
8388         }
8389
8390         /*
8391         * Don't cap the hint to a certain number of lines.
8392         * (Do cap it, though, if we have a maximum pixel height.)
8393         */
8394         int desired = layout.getHeight(cap);
8395
8396         final Drawables dr = mDrawables;
8397         if (dr != null) {
8398             desired = Math.max(desired, dr.mDrawableHeightLeft);
8399             desired = Math.max(desired, dr.mDrawableHeightRight);
8400         }
8401
8402         int linecount = layout.getLineCount();
8403         final int padding = getCompoundPaddingTop() +
```

```
8403... getCompoundPaddingBottom();
8404     desired += padding;
8405
8406     if (mMaxMode != LINES) {
8407         desired = Math.min(desired, mMaximum);
8408     } else if (cap && linecount > mMaximum && layout instanceof
... DynamicLayout) {
8409         desired = layout.getLineTop(mMaximum);
8410
8411         if (dr != null) {
8412             desired = Math.max(desired, dr.mDrawableHeightLeft);
8413             desired = Math.max(desired, dr.mDrawableHeightRight);
8414         }
8415
8416         desired += padding;
8417         linecount = mMaximum;
8418     }
8419
8420     if (mMinMode == LINES) {
8421         if (linecount < mMinimum) {
8422             desired += getLineHeight() * (mMinimum - linecount);
8423         }
8424     } else {
8425         desired = Math.max(desired, mMinimum);
8426     }
8427
8428     // Check against our minimum height
8429     desired = Math.max(desired, getSuggestedMinimumHeight());
8430
8431     return desired;
8432 }
8433
8434 /**
8435  * Check whether a change to the existing text layout requires a
8436  * new view layout.
8437  */
8438 private void checkForResize() {
8439     boolean sizeChanged = false;
8440
8441     if (mLayout != null) {
8442         // Check if our width changed
8443         if (mLayoutParams.width == LayoutParams.WRAP_CONTENT) {
8444             sizeChanged = true;
8445             invalidate();
8446         }
8447
8448         // Check if our height changed
8449         if (mLayoutParams.height == LayoutParams.WRAP_CONTENT) {
8450             int desiredHeight = getDesiredHeight();
8451
```

```
8452     if (desiredHeight != this.getHeight()) {
8453         sizeChanged = true;
8454     }
8455     } else if (mLayoutParams.height ==
... LayoutParams.MATCH_PARENT) {
8456         if (mDesiredHeightAtMeasure >= 0) {
8457             int desiredHeight = getDesiredHeight();
8458
8459             if (desiredHeight != mDesiredHeightAtMeasure) {
8460                 sizeChanged = true;
8461             }
8462         }
8463     }
8464 }
8465
8466     if (sizeChanged) {
8467         requestLayout();
8468         // caller will have already invalidated
8469     }
8470 }
8471
8472 /**
8473  * Check whether entirely new text requires a new view layout
8474  * or merely a new text layout.
8475  */
8476 private void checkForRelayout() {
8477     // If we have a fixed width, we can just swap in a new text
... layout
8478     // if the text height stays the same or if the view height is
... fixed.
8479
8480     if ((mLayoutParams.width != LayoutParams.WRAP_CONTENT
8481         || (mMaxWidthMode == mMinWidthMode && mMaxWidth ==
... mMinWidth))
8482         && (mHint == null || mHintLayout != null)
8483         && (mRight - mLeft - getCompoundPaddingLeft() -
... getCompoundPaddingRight() > 0)) {
8484         // Static width, so try making a new text layout.
8485
8486         int oldht = mLayout.getHeight();
8487         int want = mLayout.getWidth();
8488         int hintWant = mHintLayout == null ? 0 :
... mHintLayout.getWidth();
8489
8490         /*
8491         * No need to bring the text into view, since the size is
... not
8492         * changing (unless we do the requestLayout(), in which case
... it
8493         * will happen at measure).
```

```

8494     */
8495     makeNewLayout(want, hintWant, UNKNOWN_BORING,
... UNKNOWN_BORING,
8496                 mRight - mLeft - getCompoundPaddingLeft() -
... getCompoundPaddingRight(),
8497                 false);
8498
8499     if (mEllipsize !=TextUtils.TruncateAt.MARQUEE) {
8500         // In a fixed-height view, so use our new text layout.
8501         if (mLayoutParams.height != LayoutParams.WRAP_CONTENT
8502             && mLayoutParams.height !=
... LayoutParams.MATCH_PARENT) {
8503             autoSizeText();
8504             invalidate();
8505             return;
8506         }
8507
8508         // Dynamic height, but height has stayed the same,
8509         // so use our new text layout.
8510         if (mLayout.getHeight() == oldht
8511             && (mHintLayout == null ||
... mHintLayout.getHeight() == oldht)) {
8512             autoSizeText();
8513             invalidate();
8514             return;
8515         }
8516     }
8517
8518     // We lose: the height has changed and we have a dynamic
... height.
8519     // Request a new view layout using our new text layout.
8520     requestLayout();
8521     invalidate();
8522 } else {
8523     // Dynamic width, so we have no choice but to request a new
8524     // view layout with a new text layout.
8525     nullLayouts();
8526     requestLayout();
8527     invalidate();
8528 }
8529 }
8530
8531 @Override
8532 protected void onLayout(boolean changed, int left, int top, int
... right, int bottom) {
8533     super.onLayout(changed, left, top, right, bottom);
8534     if (mDeferScroll >= 0) {
8535         int curs = mDeferScroll;
8536         mDeferScroll = -1;
8537         bringPointIntoView(Math.min(curs, mText.length()));

```



```
8538     }
8539     // Call auto-size after the width and height have been
... calculated.
8540     autoSizeText();
8541 }
8542
8543 private boolean isShowingHint() {
8544     return TextUtils.isEmpty(mText) && !TextUtils.isEmpty(mHint);
8545 }
8546
8547 /**
8548  * Returns true if anything changed.
8549  */
8550 private boolean bringTextIntoView() {
8551     Layout layout = isShowingHint() ? mHintLayout : mLayout;
8552     int line = 0;
8553     if ((mGravity & Gravity.VERTICAL_GRAVITY_MASK) ==
... Gravity.BOTTOM) {
8554         line = layout.getLineCount() - 1;
8555     }
8556
8557     Layout.Alignment a = layout.getParagraphAlignment(line);
8558     int dir = layout.getParagraphDirection(line);
8559     int hspace = mRight - mLeft - getCompoundPaddingLeft() -
... getCompoundPaddingRight();
8560     int vspace = mBottom - mTop - getExtendedPaddingTop() -
... getExtendedPaddingBottom();
8561     int ht = layout.getHeight();
8562
8563     int scrollx, scrolly;
8564
8565     // Convert to left, center, or right alignment.
8566     if (a == Layout.Alignment.ALIGN_NORMAL) {
8567         a = dir == Layout.DIR_LEFT_TO_RIGHT
8568             ? Layout.Alignment.ALIGN_LEFT :
... Layout.Alignment.ALIGN_RIGHT;
8569     } else if (a == Layout.Alignment.ALIGN_OPPOSITE) {
8570         a = dir == Layout.DIR_LEFT_TO_RIGHT
8571             ? Layout.Alignment.ALIGN_RIGHT :
... Layout.Alignment.ALIGN_LEFT;
8572     }
8573
8574     if (a == Layout.Alignment.ALIGN_CENTER) {
8575         /*
8576          * Keep centered if possible, or, if it is too wide to fit,
8577          * keep leading edge in view.
8578          */
8579
8580         int left = (int) Math.floor(layout.getLineLeft(line));
8581         int right = (int) Math.ceil(layout.getLineRight(line));
```

```
8582
8583     if (right - left < hspace) {
8584         scrollx = (right + left) / 2 - hspace / 2;
8585     } else {
8586         if (dir < 0) {
8587             scrollx = right - hspace;
8588         } else {
8589             scrollx = left;
8590         }
8591     }
8592 } else if (a == Layout.Alignment.ALIGN_RIGHT) {
8593     int right = (int) Math.ceil(layout.getLineRight(line));
8594     scrollx = right - hspace;
8595 } else { // a == Layout.Alignment.ALIGN_LEFT (will also be the
... default)
8596     scrollx = (int) Math.floor(layout.getLineLeft(line));
8597 }
8598
8599     if (ht < vspace) {
8600         scrolly = 0;
8601     } else {
8602         if ((mGravity & Gravity.VERTICAL_GRAVITY_MASK) ==
... Gravity.BOTTOM) {
8603             scrolly = ht - vspace;
8604         } else {
8605             scrolly = 0;
8606         }
8607     }
8608
8609     if (scrollx != mScrollX || scrolly != mScrollY) {
8610         scrollTo(scrollx, scrolly);
8611         return true;
8612     } else {
8613         return false;
8614     }
8615 }
8616
8617 /**
8618  * Move the point, specified by the offset, into the view if it is
... needed.
8619  * This has to be called after layout. Returns true if anything
... changed.
8620  */
8621 public boolean bringPointIntoView(int offset) {
8622     if (isLayoutRequested()) {
8623         mDeferScroll = offset;
8624         return false;
8625     }
8626     boolean changed = false;
8627
```

```
8628     Layout layout = isShowingHint() ? mHintLayout : mLayout;
8629
8630     if (layout == null) return changed;
8631
8632     int line = layout.getLineForOffset(offset);
8633
8634     int grav;
8635
8636     switch (layout.getParagraphAlignment(line)) {
8637         case ALIGN_LEFT:
8638             grav = 1;
8639             break;
8640         case ALIGN_RIGHT:
8641             grav = -1;
8642             break;
8643         case ALIGN_NORMAL:
8644             grav = layout.getParagraphDirection(line);
8645             break;
8646         case ALIGN_OPPOSITE:
8647             grav = -layout.getParagraphDirection(line);
8648             break;
8649         case ALIGN_CENTER:
8650             default:
8651                 grav = 0;
8652                 break;
8653     }
8654
8655     // We only want to clamp the cursor to fit within the layout
8656     ... width
8657     // in left-to-right modes, because in a right to left alignment,
8658     // we want to scroll to keep the line-right on the screen, as
8659     ... other
8660     // lines are likely to have text flush with the right margin,
8661     ... which
8662     // we want to keep visible.
8663     // A better long-term solution would probably be to measure both
8664     // the full line and a blank-trimmed version, and, for example,
8665     ... use
8666     // the latter measurement for centering and right alignment, but
8667     ... for
8668     // the time being we only implement the cursor clamping in left
8669     ... to
8670     // right where it is most likely to be annoying.
8671     final boolean clamped = grav > 0;
8672     // FIXME: Is it okay to truncate this, or should we round?
8673     final int x = (int) layout.getPrimaryHorizontal(offset,
8674     ... clamped);
8675     final int top = layout.getLineTop(line);
8676     final int bottom = layout.getLineTop(line + 1);
8677
```

```
8671     int left = (int) Math.floor(layout.getLineLeft(line));
8672     int right = (int) Math.ceil(layout.getLineRight(line));
8673     int ht = layout.getHeight();
8674
8675     int hspace = mRight - mLeft - getCompoundPaddingLeft() -
... getCompoundPaddingRight();
8676     int vspace = mBottom - mTop - getExtendedPaddingTop() -
... getExtendedPaddingBottom();
8677     if (!mHorizontallyScrolling && right - left > hspace && right >
... x) {
8678         // If cursor has been clamped, make sure we don't scroll.
8679         right = Math.max(x, left + hspace);
8680     }
8681
8682     int hslack = (bottom - top) / 2;
8683     int vslack = hslack;
8684
8685     if (vslack > vspace / 4) {
8686         vslack = vspace / 4;
8687     }
8688     if (hslack > hspace / 4) {
8689         hslack = hspace / 4;
8690     }
8691
8692     int hs = mScrollX;
8693     int vs = mScrollY;
8694
8695     if (top - vs < vslack) {
8696         vs = top - vslack;
8697     }
8698     if (bottom - vs > vspace - vslack) {
8699         vs = bottom - (vspace - vslack);
8700     }
8701     if (ht - vs < vspace) {
8702         vs = ht - vspace;
8703     }
8704     if (0 - vs > 0) {
8705         vs = 0;
8706     }
8707
8708     if (grav != 0) {
8709         if (x - hs < hslack) {
8710             hs = x - hslack;
8711         }
8712         if (x - hs > hspace - hslack) {
8713             hs = x - (hspace - hslack);
8714         }
8715     }
8716
8717     if (grav < 0) {
```

```
8718     if (left - hs > 0) {
8719         hs = left;
8720     }
8721     if (right - hs < hspace) {
8722         hs = right - hspace;
8723     }
8724 } else if (grav > 0) {
8725     if (right - hs < hspace) {
8726         hs = right - hspace;
8727     }
8728     if (left - hs > 0) {
8729         hs = left;
8730     }
8731 } else /* grav == 0 */ {
8732     if (right - left <= hspace) {
8733         /*
8734          * If the entire text fits, center it exactly.
8735          */
8736         hs = left - (hspace - (right - left)) / 2;
8737     } else if (x > right - hslack) {
8738         /*
8739          * If we are near the right edge, keep the right edge
8740          * at the edge of the view.
8741          */
8742         hs = right - hspace;
8743     } else if (x < left + hslack) {
8744         /*
8745          * If we are near the left edge, keep the left edge
8746          * at the edge of the view.
8747          */
8748         hs = left;
8749     } else if (left > hs) {
8750         /*
8751          * Is there whitespace visible at the left?  Fix it if
8752          ... so.
8753             */
8754         hs = left;
8755     } else if (right < hs + hspace) {
8756         /*
8757          * Is there whitespace visible at the right?  Fix it if
8758          ... so.
8759             */
8760         hs = right - hspace;
8761     } else {
8762         /*
8763          * Otherwise, float as needed.
8764          */
8765         if (x - hs < hslack) {
8766             hs = x - hslack;
8767         }
8768     }
8769 }
```

```
8766         if (x - hs > hspace - hslack) {
8767             hs = x - (hspace - hslack);
8768         }
8769     }
8770 }
8771
8772     if (hs != mScrollX || vs != mScrollY) {
8773         if (mScroller == null) {
8774             scrollTo(hs, vs);
8775         } else {
8776             long duration =
... AnimationUtils.currentAnimationTimeMillis() - mLastScroll;
8777             int dx = hs - mScrollX;
8778             int dy = vs - mScrollY;
8779
8780             if (duration > ANIMATED_SCROLL_GAP) {
8781                 mScroller.startScroll(mScrollX, mScrollY, dx, dy);
8782                 awakenScrollBars(mScroller.getDuration());
8783                 invalidate();
8784             } else {
8785                 if (!mScroller.isFinished()) {
8786                     mScroller.abortAnimation();
8787                 }
8788
8789                 scrollBy(dx, dy);
8790             }
8791
8792             mLastScroll =
... AnimationUtils.currentAnimationTimeMillis();
8793         }
8794
8795         changed = true;
8796     }
8797
8798     if (isFocused()) {
8799         // This offsets because getInterestingRect() is in terms of
... viewport coordinates, but
8800         // requestRectangleOnScreen() is in terms of content
... coordinates.
8801
8802         // The offsets here are to ensure the rectangle we are using
... is
8803         // within our view bounds, in case the cursor is on the far
... left
8804         // or right. If it isn't within the bounds, then this
... request
8805         // will be ignored.
8806         if (mTempRect == null) mTempRect = new Rect();
8807         mTempRect.set(x - 2, top, x + 2, bottom);
8808         getInterestingRect(mTempRect, line);
```

```
8809         mTempRect.offset(mScrollX, mScrollY);
8810
8811         if (requestRectangleOnScreen(mTempRect)) {
8812             changed = true;
8813         }
8814     }
8815
8816     return changed;
8817 }
8818
8819 /**
8820  * Move the cursor, if needed, so that it is at an offset that is
... visible
8821  * to the user. This will not move the cursor if it represents more
... than
8822  * one character (a selection range). This will only work if the
8823  * TextView contains spannable text; otherwise it will do nothing.
8824  *
8825  * @return True if the cursor was actually moved, false otherwise.
8826  */
8827 public boolean moveCursorToVisibleOffset() {
8828     if (!(mText instanceof Spannable)) {
8829         return false;
8830     }
8831     int start = getSelectionStart();
8832     int end = getSelectionEnd();
8833     if (start != end) {
8834         return false;
8835     }
8836
8837     // First: make sure the line is visible on screen:
8838
8839     int line = mLayout.getLineForOffset(start);
8840
8841     final int top = mLayout.getLineTop(line);
8842     final int bottom = mLayout.getLineTop(line + 1);
8843     final int vspace = mBottom - mTop - getExtendedPaddingTop() -
... getExtendedPaddingBottom();
8844     int vslack = (bottom - top) / 2;
8845     if (vslack > vspace / 4) {
8846         vslack = vspace / 4;
8847     }
8848     final int vs = mScrollY;
8849
8850     if (top < (vs + vslack)) {
8851         line = mLayout.getLineForVertical(vs + vslack + (bottom -
... top));
8852     } else if (bottom > (vspace + vs - vslack)) {
8853         line = mLayout.getLineForVertical(vspace + vs - vslack -
... (bottom - top));
```

```
8854     }
8855
8856     // Next: make sure the character is visible on screen:
8857
8858     final int hspace = mRight - mLeft - getCompoundPaddingLeft() -
... getCompoundPaddingRight();
8859     final int hs = mScrollX;
8860     final int leftChar = mLayout.getOffsetForHorizontal(line, hs);
8861     final int rightChar = mLayout.getOffsetForHorizontal(line,
... hspace + hs);
8862
8863     // line might contain bidirectional text
8864     final int lowChar = leftChar < rightChar ? leftChar : rightChar;
8865     final int highChar = leftChar > rightChar ? leftChar :
... rightChar;
8866
8867     int newStart = start;
8868     if (newStart < lowChar) {
8869         newStart = lowChar;
8870     } else if (newStart > highChar) {
8871         newStart = highChar;
8872     }
8873
8874     if (newStart != start) {
8875         Selection.setSelection((Spannable) mText, newStart);
8876         return true;
8877     }
8878
8879     return false;
8880 }
8881
8882 @Override
8883 public void computeScroll() {
8884     if (mScroller != null) {
8885         if (mScroller.computeScrollOffset()) {
8886             mScrollX = mScroller.getCurrX();
8887             mScrollY = mScroller.getCurrY();
8888             invalidateParentCaches();
8889             postInvalidate(); // So we draw again
8890         }
8891     }
8892 }
8893
8894 private void getInterestingRect(Rect r, int line) {
8895     convertFromViewportToContentCoordinates(r);
8896
8897     // Rectangle can be expanded on first and last line to take
8898     // padding into account.
8899     // TODO Take left/right padding into account too?
8900     if (line == 0) r.top -= getExtendedPaddingTop();
```



```

8901     if (line == mLayout.getLineCount() - 1) r.bottom +=
...   getExtendedPaddingBottom();
8902     }
8903
8904     private void convertFromViewportToContentCoordinates(Rect r) {
8905         final int horizontalOffset =
...   viewportToContentHorizontalOffset();
8906         r.left += horizontalOffset;
8907         r.right += horizontalOffset;
8908
8909         final int verticalOffset = viewportToContentVerticalOffset();
8910         r.top += verticalOffset;
8911         r.bottom += verticalOffset;
8912     }
8913
8914     int viewportToContentHorizontalOffset() {
8915         return getCompoundPaddingLeft() - mScrollX;
8916     }
8917
8918     int viewportToContentVerticalOffset() {
8919         int offset = getExtendedPaddingTop() - mScrollY;
8920         if ((mGravity & Gravity.VERTICAL_GRAVITY_MASK) != Gravity.TOP) {
8921             offset += getVerticalOffset(false);
8922         }
8923         return offset;
8924     }
8925
8926     @Override
8927     public void debug(int depth) {
8928         super.debug(depth);
8929
8930         String output = debugIndent(depth);
8931         output += "frame={" + mLeft + ", " + mTop + ", " + mRight
8932             + ", " + mBottom + "} scroll={" + mScrollX + ", " +
...   mScrollY
8933             + "} ";
8934
8935         if (mText != null) {
8936
8937             output += "mText=\"" + mText + "\" ";
8938             if (mLayout != null) {
8939                 output += "mLayout width=" + mLayout.getWidth()
8940                     + " height=" + mLayout.getHeight();
8941             }
8942         } else {
8943             output += "mText=NULL";
8944         }
8945         Log.d(VIEW_LOG_TAG, output);
8946     }
8947

```

```
8948 /**
8949  * Convenience for {@link Selection#getSelectionStart}.
8950 */
8951 @ViewDebug.ExportedProperty(category = "text")
8952 public int getSelectionStart() {
8953     return Selection.getSelectionStart(getText());
8954 }
8955
8956 /**
8957  * Convenience for {@link Selection#getSelectionEnd}.
8958 */
8959 @ViewDebug.ExportedProperty(category = "text")
8960 public int getSelectionEnd() {
8961     return Selection.getSelectionEnd(getText());
8962 }
8963
8964 /**
8965  * Return true iff there is a selection inside this text view.
8966 */
8967 public boolean hasSelection() {
8968     final int selectionStart = getSelectionStart();
8969     final int selectionEnd = getSelectionEnd();
8970
8971     return selectionStart >= 0 && selectionStart != selectionEnd;
8972 }
8973
8974 String getSelectedText() {
8975     if (!hasSelection()) {
8976         return null;
8977     }
8978
8979     final int start = getSelectionStart();
8980     final int end = getSelectionEnd();
8981     return String.valueOf(
8982         start > end ? mText.subSequence(end, start) :
8983         ... mText.subSequence(start, end));
8984 }
8985
8986 /**
8987  * Sets the properties of this field (lines, horizontally scrolling,
8988  * transformation method) to be for a single-line input.
8989  *
8990  * @attr ref android.R.styleable#TextView_singleLine
8991 */
8992 public void setSingleLine() {
8993     setSingleLine(true);
8994 }
8995
8996 /**
8997  * Sets the properties of this field to transform input to ALL CAPS
```

```
8997 * display. This may use a "small caps" formatting if available.
8998 * This setting will be ignored if this field is editable or
... selectable.
8999 *
9000 * This call replaces the current transformation method. Disabling
... this
9001 * will not necessarily restore the previous behavior from before
... this
9002 * was enabled.
9003 *
9004 * @see #setTransformationMethod(TransformationMethod)
9005 * @attr ref android.R.styleable#TextView_textAllCaps
9006 */
9007 public void setAllCaps(boolean allCaps) {
9008     if (allCaps) {
9009         setTransformationMethod(new
... AllCapsTransformationMethod(getContext()));
9010     } else {
9011         setTransformationMethod(null);
9012     }
9013 }
9014
9015 /**
9016 * If true, sets the properties of this field (number of lines,
... horizontally scrolling,
9017 * transformation method) to be for a single-line input; if false,
... restores these to the default
9018 * conditions.
9019 *
9020 * Note that the default conditions are not necessarily those that
... were in effect prior this
9021 * method, and you may want to reset these properties to your custom
... values.
9022 *
9023 * @attr ref android.R.styleable#TextView_singleLine
9024 */
9025 @android.view.RemotableViewMethod
9026 public void setSingleLine(boolean singleLine) {
9027     // Could be used, but may break backward compatibility.
9028     // if (mSingleLine == singleLine) return;
9029     setInputTypeSingleLine(singleLine);
9030     applySingleLine(singleLine, true, true);
9031 }
9032
9033 /**
9034 * Adds or remove the EditorInfo.TYPE_TEXT_FLAG_MULTI_LINE on the
... mInputType.
9035 * @param singleLine
9036 */
9037 private void setInputTypeSingleLine(boolean singleLine) {
```

```
9038     if (mEditor != null
9039         && (mEditor.mInputType & EditorInfo.TYPE_MASK_CLASS)
9040         == EditorInfo.TYPE_CLASS_TEXT) {
9041         if (singleLine) {
9042             mEditor.mInputType &=
9043 ~EditorInfo.TYPE_TEXT_FLAG_MULTI_LINE;
9044         } else {
9045             mEditor.mInputType |=
9046 EditorInfo.TYPE_TEXT_FLAG_MULTI_LINE;
9047         }
9048     }
9049     private void applySingleLine(boolean singleLine, boolean
9050 applyTransformation,
9051         boolean changeMaxLines) {
9052         mSingleLine = singleLine;
9053         if (singleLine) {
9054             setLines(1);
9055             setHorizontallyScrolling(true);
9056             if (applyTransformation) {
9057                 setTransformationMethod(SingleLineTransformationMethod.getInstance());
9058             }
9059         } else {
9060             if (changeMaxLines) {
9061                 setMaxLines(Integer.MAX_VALUE);
9062             }
9063             setHorizontallyScrolling(false);
9064             if (applyTransformation) {
9065                 setTransformationMethod(null);
9066             }
9067         }
9068     }
9069     /**
9070      * Causes words in the text that are longer than the view's width
9071      * to be ellipsized instead of broken in the middle. You may also
9072      * want to {@link #setSingleLine} or {@link
9073 ... #setHorizontallyScrolling}
9074      * to constrain the text to a single line. Use <code>null</code>
9075      * to turn off ellipsizing.
9076      *
9077      * If {@link #setMaxLines} has been used to set two or more lines,
9078      * only {@link android.text.TextUtils.TruncateAt#END} and
9079      * {@link android.text.TextUtils.TruncateAt#MARQUEE} are supported
9080      * (other ellipsizing types will not do anything).
9081      *
9082      * @attr ref android.R.styleable#TextView_ellipsize
9083      */
```

```
9083     public void setEllipsize(TextUtils.TruncateAt where) {
9084         // TruncateAt is an enum. != comparison is ok between these
... singleton objects.
9085         if (mEllipsize != where) {
9086             mEllipsize = where;
9087
9088             if (mLayout != null) {
9089                 nullLayouts();
9090                 requestLayout();
9091                 invalidate();
9092             }
9093         }
9094     }
9095
9096     /**
9097     * Sets how many times to repeat the marquee animation. Only applied
... if the
9098     * TextView has marquee enabled. Set to -1 to repeat indefinitely.
9099     *
9100     * @see #getMarqueeRepeatLimit()
9101     *
9102     * @attr ref android.R.styleable#TextView_marqueeRepeatLimit
9103     */
9104     public void setMarqueeRepeatLimit(int marqueeLimit) {
9105         mMarqueeRepeatLimit = marqueeLimit;
9106     }
9107
9108     /**
9109     * Gets the number of times the marquee animation is repeated. Only
... meaningful if the
9110     * TextView has marquee enabled.
9111     *
9112     * @return the number of times the marquee animation is repeated. -1
... if the animation
9113     * repeats indefinitely
9114     *
9115     * @see #setMarqueeRepeatLimit(int)
9116     *
9117     * @attr ref android.R.styleable#TextView_marqueeRepeatLimit
9118     */
9119     public int getMarqueeRepeatLimit() {
9120         return mMarqueeRepeatLimit;
9121     }
9122
9123     /**
9124     * Returns where, if anywhere, words that are longer than the view
9125     * is wide should be ellipsized.
9126     */
9127     @ViewDebug.ExportedProperty
9128     public TextUtils.TruncateAt getEllipsize() {
```

```

9129     return mEllipsize;
9130 }
9131
9132 /**
9133  * Set the TextView so that when it takes focus, all the text is
9134  * selected.
9135  *
9136  * @attr ref android.R.styleable#TextView_selectAllOnFocus
9137  */
9138 @android.view.RemotableViewMethod
9139 public void setSelectAllOnFocus(boolean selectAllOnFocus) {
9140     createEditorIfNeeded();
9141     mEditor.mSelectAllOnFocus = selectAllOnFocus;
9142
9143     if (selectAllOnFocus && !(mText instanceof Spannable)) {
9144         setText(mText, BufferType.SPANNABLE);
9145     }
9146 }
9147
9148 /**
9149  * Set whether the cursor is visible. The default is true. Note that
... this property only
9150  * makes sense for editable TextView.
9151  *
9152  * @see #isCursorVisible()
9153  *
9154  * @attr ref android.R.styleable#TextView_cursorVisible
9155  */
9156 @android.view.RemotableViewMethod
9157 public void setCursorVisible(boolean visible) {
9158     if (visible && mEditor == null) return; // visible is the
... default value with no edit data
9159     createEditorIfNeeded();
9160     if (mEditor.mCursorVisible != visible) {
9161         mEditor.mCursorVisible = visible;
9162         invalidate();
9163
9164         mEditor.makeBlink();
9165
9166         // InsertionPointCursorController depends on mCursorVisible
9167         mEditor.prepareCursorControllers();
9168     }
9169 }
9170
9171 /**
9172  * @return whether or not the cursor is visible (assuming this
... TextView is editable)
9173  *
9174  * @see #setCursorVisible(boolean)
9175  *

```

```
9176 * @attr ref android.R.styleable#TextView_cursorVisible
9177 */
9178 public boolean isCursorVisible() {
9179     // true is the default value
9180     return mEditor == null ? true : mEditor.mCursorVisible;
9181 }
9182
9183 private boolean canMarquee() {
9184     int width = mRight - mLeft - getCompoundPaddingLeft() -
... getCompoundPaddingRight();
9185     return width > 0 && (mLayout.getLineWidth(0) > width
9186         || (mMarqueeFadeMode != MARQUEE_FADE_NORMAL &&
... mSavedMarqueeModeLayout != null
9187         && mSavedMarqueeModeLayout.getLineWidth(0) >
... width));
9188 }
9189
9190 private void startMarquee() {
9191     // Do not ellipsize EditText
9192     if (getKeyListener() != null) return;
9193
9194     if (compressText(getWidth() - getCompoundPaddingLeft() -
... getCompoundPaddingRight())) {
9195         return;
9196     }
9197
9198     if ((mMarquee == null || mMarquee.isStopped()) && (isFocused()
... || isSelected())
9199         && getLineCount() == 1 && canMarquee()) {
9200
9201         if (mMarqueeFadeMode == MARQUEE_FADE_SWITCH_SHOW_ELLIPSIS) {
9202             mMarqueeFadeMode = MARQUEE_FADE_SWITCH_SHOW_FADE;
9203             final Layout tmp = mLayout;
9204             mLayout = mSavedMarqueeModeLayout;
9205             mSavedMarqueeModeLayout = tmp;
9206             setHorizontalFadingEdgeEnabled(true);
9207             requestLayout();
9208             invalidate();
9209         }
9210
9211         if (mMarquee == null) mMarquee = new Marquee(this);
9212         mMarquee.start(mMarqueeRepeatLimit);
9213     }
9214 }
9215
9216 private void stopMarquee() {
9217     if (mMarquee != null && !mMarquee.isStopped()) {
9218         mMarquee.stop();
9219     }
9220
```

```
9221     if (mMarqueeFadeMode == MARQUEE_FADE_SWITCH_SHOW_FADE) {
9222         mMarqueeFadeMode = MARQUEE_FADE_SWITCH_SHOW_ELLIPSIS;
9223         final Layout tmp = mSavedMarqueeModeLayout;
9224         mSavedMarqueeModeLayout = mLayout;
9225         mLayout = tmp;
9226         setHorizontalFadingEdgeEnabled(false);
9227         requestLayout();
9228         invalidate();
9229     }
9230 }
9231
9232 private void startStopMarquee(boolean start) {
9233     if (mEllipsize == TextUtils.TruncateAt.MARQUEE) {
9234         if (start) {
9235             startMarquee();
9236         } else {
9237             stopMarquee();
9238         }
9239     }
9240 }
9241
9242 /**
9243  * This method is called when the text is changed, in case any
... subclasses
9244  * would like to know.
9245  *
9246  * Within <code>text</code>, the <code>lengthAfter</code> characters
9247  * beginning at <code>start</code> have just replaced old text that
... had
9248  * length <code>lengthBefore</code>. It is an error to attempt to
... make
9249  * changes to <code>text</code> from this callback.
9250  *
9251  * @param text The text the TextView is displaying
9252  * @param start The offset of the start of the range of the text
... that was
9253  * modified
9254  * @param lengthBefore The length of the former text that has been
... replaced
9255  * @param lengthAfter The length of the replacement modified text
9256  */
9257     protected void onTextChanged(CharSequence text, int start, int
... lengthBefore, int lengthAfter) {
9258         // intentionally empty, template pattern method can be
... overridden by subclasses
9259     }
9260
9261     /**
9262     * This method is called when the selection has changed, in case any
9263     * subclasses would like to know.
```



```
9264 *
9265 * @param selStart The new selection start location.
9266 * @param selEnd The new selection end location.
9267 */
9268 protected void onSelectionChanged(int selStart, int selEnd) {
9269
9270     ... sendAccessibilityEvent(AccessibilityEvent.
9271     ... TYPE_VIEW_TEXT_SELECTION_CHANGED);
9272 }
9273
9274 /**
9275 * Adds a TextWatcher to the list of those whose methods are called
9276 * whenever this TextView's text changes.
9277 * <p>
9278 * In 1.0, the {@link TextWatcher#afterTextChanged} method was
9279 * erroneously
9280 * not called after {@link #setText} calls. Now, doing {@link
9281 * #setText}
9282 * if there are any text changed listeners forces the buffer type to
9283 * Editable if it would not otherwise be and does call this method.
9284 */
9285 public void addTextChangedListener(TextWatcher watcher) {
9286     if (mListeners == null) {
9287         mListeners = new ArrayList<TextWatcher>();
9288     }
9289     mListeners.add(watcher);
9290 }
9291
9292 /**
9293 * Removes the specified TextWatcher from the list of those whose
9294 * methods are called
9295 * whenever this TextView's text changes.
9296 */
9297 public void removeTextChangedListener(TextWatcher watcher) {
9298     if (mListeners != null) {
9299         int i = mListeners.indexOf(watcher);
9300
9301         if (i >= 0) {
9302             mListeners.remove(i);
9303         }
9304     }
9305 }
9306
9307 private void sendBeforeTextChanged(CharSequence text, int start, int
9308 ... before, int after) {
9309     if (mListeners != null) {
9310         final ArrayList<TextWatcher> list = mListeners;
9311         final int count = list.size();
9312         for (int i = 0; i < count; i++) {
```

```
9309 list.get(i).beforeTextChanged(text, start, before,
... after);
9310     }
9311     }
9312
9313     // The spans that are inside or intersect the modified region no
... longer make sense
9314     removeIntersectingNonAdjacentSpans(start, start + before,
... SpellCheckSpan.class);
9315     removeIntersectingNonAdjacentSpans(start, start + before,
... SuggestionSpan.class);
9316     }
9317
9318     // Removes all spans that are inside or actually overlap the
... start..end range
9319     private <T> void removeIntersectingNonAdjacentSpans(int start, int
... end, Class<T> type) {
9320         if (!(mText instanceof Editable)) return;
9321         Editable text = (Editable) mText;
9322
9323         T[] spans = text.getSpans(start, end, type);
9324         final int length = spans.length;
9325         for (int i = 0; i < length; i++) {
9326             final int spanStart = text.getSpanStart(spans[i]);
9327             final int spanEnd = text.getSpanEnd(spans[i]);
9328             if (spanEnd == start || spanStart == end) break;
9329             text.removeSpan(spans[i]);
9330         }
9331     }
9332
9333     void removeAdjacentSuggestionSpans(final int pos) {
9334         if (!(mText instanceof Editable)) return;
9335         final Editable text = (Editable) mText;
9336
9337         final SuggestionSpan[] spans = text.getSpans(pos, pos,
... SuggestionSpan.class);
9338         final int length = spans.length;
9339         for (int i = 0; i < length; i++) {
9340             final int spanStart = text.getSpanStart(spans[i]);
9341             final int spanEnd = text.getSpanEnd(spans[i]);
9342             if (spanEnd == pos || spanStart == pos) {
9343                 if (SpellChecker.haveWordBoundariesChanged(text, pos,
... pos, spanStart, spanEnd)) {
9344                     text.removeSpan(spans[i]);
9345                 }
9346             }
9347         }
9348     }
9349
9350     /**
```

```
9351 * Not private so it can be called from an inner class without going
9352 * through a thunk.
9353 */
9354 void sendOnTextChanged(CharSequence text, int start, int before, int
... after) {
9355     if (mListeners != null) {
9356         final ArrayList<TextWatcher> list = mListeners;
9357         final int count = list.size();
9358         for (int i = 0; i < count; i++) {
9359             list.get(i).onTextChanged(text, start, before, after);
9360         }
9361     }
9362
9363     if (mEditor != null) mEditor.sendOnTextChanged(start, after);
9364 }
9365
9366 /**
9367 * Not private so it can be called from an inner class without going
9368 * through a thunk.
9369 */
9370 void sendAfterTextChanged(Editable text) {
9371     if (mListeners != null) {
9372         final ArrayList<TextWatcher> list = mListeners;
9373         final int count = list.size();
9374         for (int i = 0; i < count; i++) {
9375             list.get(i).afterTextChanged(text);
9376         }
9377     }
9378
9379     // Always notify AutoFillManager - it will return right away if
... autofill is disabled.
9380     notifyAutoFillManagerAfterTextChangedIfNeeded();
9381
9382     hideErrorIfUnchanged();
9383 }
9384
9385 private void notifyAutoFillManagerAfterTextChangedIfNeeded() {
9386     // It is important to not check whether the view is important
... for autofill
9387     // since the user can trigger autofill manually on not important
... views.
9388     if (!isAutofillable()) {
9389         return;
9390     }
9391     final AutoFillManager afm =
... mContext.getSystemService(AutoFillManager.class);
9392     if (afm != null) {
9393         if (DEBUG_AUTOFILL) {
9394             Log.v(LOG_TAG, "sendAfterTextChanged(): notify AFM for
... text=" + mText);
```

```
9395     }
9396         afm.notifyValueChanged(TextView.this);
9397     }
9398 }
9399
9400 private boolean isAutofillable() {
9401     // It is important to not check whether the view is important
... for autofill
9402     // since the user can trigger autofill manually on not important
... views.
9403     return getAutofillType() != AUTOFILL_TYPE_NONE;
9404 }
9405
9406 void updateAfterEdit() {
9407     invalidate();
9408     int curs = getSelectionStart();
9409
9410     if (curs >= 0 || (mGravity & Gravity.VERTICAL_GRAVITY_MASK) ==
... Gravity.BOTTOM) {
9411         registerForPreDraw();
9412     }
9413
9414     checkForResize();
9415
9416     if (curs >= 0) {
9417         mHighlightPathBogus = true;
9418         if (mEditor != null) mEditor.makeBlink();
9419         bringPointIntoView(curs);
9420     }
9421 }
9422
9423 /**
9424  * Not private so it can be called from an inner class without going
9425  * through a thunk.
9426  */
9427 void handleTextChanged(CharSequence buffer, int start, int before,
... int after) {
9428     sLastCutCopyOrTextChangedTime = 0;
9429
9430     final Editor.InputMethodState ims = mEditor == null ? null :
... mEditor.mInputMethodState;
9431     if (ims == null || ims.mBatchEditNesting == 0) {
9432         updateAfterEdit();
9433     }
9434     if (ims != null) {
9435         ims.mContentChanged = true;
9436         if (ims.mChangedStart < 0) {
9437             ims.mChangedStart = start;
9438             ims.mChangedEnd = start + before;
9439         } else {
```

```
9440         ims.mChangedStart = Math.min(ims.mChangedStart, start);
9441         ims.mChangedEnd = Math.max(ims.mChangedEnd, start +
... before - ims.mChangedDelta);
9442     }
9443     ims.mChangedDelta += after - before;
9444 }
9445 resetErrorChangedFlag();
9446 sendOnTextChanged(buffer, start, before, after);
9447 onTextChanged(buffer, start, before, after);
9448 }
9449
9450 /**
9451  * Not private so it can be called from an inner class without going
9452  * through a thunk.
9453  */
9454 void spanChange(Spanned buf, Object what, int oldStart, int
... newStart, int oldEnd, int newEnd) {
9455     // XXX Make the start and end move together if this ends up
9456     // spending too much time invalidating.
9457
9458     boolean selChanged = false;
9459     int newSelStart = -1, newSelEnd = -1;
9460
9461     final Editor.InputMethodState ims = mEditor == null ? null :
... mEditor.mInputMethodState;
9462
9463     if (what == Selection.SELECTION_END) {
9464         selChanged = true;
9465         newSelEnd = newStart;
9466
9467         if (oldStart >= 0 || newStart >= 0) {
9468             invalidateCursor(Selection.getSelectionStart(buf),
... oldStart, newStart);
9469             checkForResize();
9470             registerForPreDraw();
9471             if (mEditor != null) mEditor.makeBlink();
9472         }
9473     }
9474
9475     if (what == Selection.SELECTION_START) {
9476         selChanged = true;
9477         newSelStart = newStart;
9478
9479         if (oldStart >= 0 || newStart >= 0) {
9480             int end = Selection.getSelectionEnd(buf);
9481             invalidateCursor(end, oldStart, newStart);
9482         }
9483     }
9484
9485     if (selChanged) {
```

```
9486 mHighlightPathBogus = true;
9487 if (mEditor != null && !isFocused()) mEditor.mSelectionMoved
... = true;
9488
9489 if ((buf.getSpanFlags(what) & Spanned.SPAN_INTERMEDIATE) ==
... 0) {
9490     if (newSelStart < 0) {
9491         newSelStart = Selection.getSelectionStart(buf);
9492     }
9493     if (newSelEnd < 0) {
9494         newSelEnd = Selection.getSelectionEnd(buf);
9495     }
9496
9497     if (mEditor != null) {
9498         mEditor.refreshTextActionMode();
9499         if (!hasSelection()
9500             && mEditor.getTextActionMode() == null &&
... hasTransientState()) {
9501             // User generated selection has been removed.
9502             setHasTransientState(false);
9503         }
9504     }
9505     onSelectionChanged(newSelStart, newSelEnd);
9506 }
9507 }
9508
9509 if (what instanceof UpdateAppearance || what instanceof
... ParagraphStyle
9510     || what instanceof CharacterStyle) {
9511     if (ims == null || ims.mBatchEditNesting == 0) {
9512         invalidate();
9513         mHighlightPathBogus = true;
9514         checkForResize();
9515     } else {
9516         ims.mContentChanged = true;
9517     }
9518     if (mEditor != null) {
9519         if (oldStart >= 0)
... mEditor.invalidateTextDisplayList(mLayout, oldStart, oldEnd);
9520         if (newStart >= 0)
... mEditor.invalidateTextDisplayList(mLayout, newStart, newEnd);
9521         mEditor.invalidateHandlesAndActionMode();
9522     }
9523 }
9524
9525 if (MetaKeyListener.isMetaTracker(buf, what)) {
9526     mHighlightPathBogus = true;
9527     if (ims != null &&
... MetaKeyListener.isSelectingMetaTracker(buf, what)) {
9528         ims.mSelectionModeChanged = true;
```

```
9529     }
9530
9531     if (Selection.getSelectionStart(buf) >= 0) {
9532         if (ims == null || ims.mBatchEditNesting == 0) {
9533             invalidateCursor();
9534         } else {
9535             ims.mCursorChanged = true;
9536         }
9537     }
9538 }
9539
9540 if (what instanceof ParcelableSpan) {
9541     // If this is a span that can be sent to a remote process,
9542     // the current extract editor would be interested in it.
9543     if (ims != null && ims.mExtractedTextRequest != null) {
9544         if (ims.mBatchEditNesting != 0) {
9545             if (oldStart >= 0) {
9546                 if (ims.mChangedStart > oldStart) {
9547                     ims.mChangedStart = oldStart;
9548                 }
9549                 if (ims.mChangedStart > oldEnd) {
9550                     ims.mChangedStart = oldEnd;
9551                 }
9552             }
9553             if (newStart >= 0) {
9554                 if (ims.mChangedStart > newStart) {
9555                     ims.mChangedStart = newStart;
9556                 }
9557                 if (ims.mChangedStart > newEnd) {
9558                     ims.mChangedStart = newEnd;
9559                 }
9560             }
9561         } else {
9562             if (DEBUG_EXTRACT) {
9563                 Log.v(LOG_TAG, "Span change outside of batch: "
9564                     + oldStart + "-" + oldEnd + ", "
9565                     + newStart + "-" + newEnd + " " + what);
9566             }
9567             ims.mContentChanged = true;
9568         }
9569     }
9570 }
9571
9572 if (mEditor != null && mEditor.mSpellChecker != null && newStart
9573 < 0
9574     && what instanceof SpellCheckSpan) {
9575     mEditor.mSpellChecker.onSpellCheckSpanRemoved((SpellCheckSpan) what);
9576 }
```

```
9577
9578     @Override
9579     protected void onFocusChanged(boolean focused, int direction, Rect
... previouslyFocusedRect) {
9580         if (isTemporarilyDetached()) {
9581             // If we are temporarily in the detach state, then do
... nothing.
9582             super.onFocusChanged(focused, direction,
... previouslyFocusedRect);
9583             return;
9584         }
9585
9586         if (mEditor != null) mEditor.onFocusChanged(focused, direction);
9587
9588         if (focused) {
9589             if (mText instanceof Spannable) {
9590                 Spannable sp = (Spannable) mText;
9591                 MetaKeyListener.resetMetaState(sp);
9592             }
9593         }
9594
9595         startStopMarquee(focused);
9596
9597         if (mTransformation != null) {
9598             mTransformation.onFocusChanged(this, mText, focused,
... direction, previouslyFocusedRect);
9599         }
9600
9601         super.onFocusChanged(focused, direction, previouslyFocusedRect);
9602     }
9603
9604     @Override
9605     public void onWindowFocusChanged(boolean hasWindowFocus) {
9606         super.onWindowFocusChanged(hasWindowFocus);
9607
9608         if (mEditor != null)
... mEditor.onWindowFocusChanged(hasWindowFocus);
9609
9610         startStopMarquee(hasWindowFocus);
9611     }
9612
9613     @Override
9614     protected void onVisibilityChanged(View changedView, int visibility)
... {
9615         super.onVisibilityChanged(changedView, visibility);
9616         if (mEditor != null && visibility != VISIBLE) {
9617             mEditor.hideCursorAndSpanControllers();
9618             stopTextActionMode();
9619         }
9620     }
```



```
9621
9622     /**
9623     * Use {@link BaseInputConnection#removeComposingSpans
9624     * BaseInputConnection.removeComposingSpans()} to remove any IME
... composing
9625     * state from this text view.
9626     */
9627     public void clearComposingText() {
9628         if (mText instanceof Spannable) {
9629             BaseInputConnection.removeComposingSpans((Spannable) mText);
9630         }
9631     }
9632
9633     @Override
9634     public void setSelected(boolean selected) {
9635         boolean wasSelected = isSelected();
9636
9637         super.setSelected(selected);
9638
9639         if (selected != wasSelected && mEllipsize ==
... TextUtils.TruncateAt.MARQUEE) {
9640             if (selected) {
9641                 startMarquee();
9642             } else {
9643                 stopMarquee();
9644             }
9645         }
9646     }
9647
9648     @Override
9649     public boolean onTouchEvent(MotionEvent event) {
9650         final int action = event.getActionMasked();
9651         if (mEditor != null) {
9652             mEditor.onTouchEvent(event);
9653
9654             if (mEditor.mSelectionModifierCursorController != null
9655                 &&
... mEditor.mSelectionModifierCursorController.isDragAcceleratorActive()) {
9656                 return true;
9657             }
9658         }
9659
9660         final boolean superResult = super.onTouchEvent(event);
9661
9662         /**
9663         * Don't handle the release after a long press, because it will
... move the selection away from
9664         * whatever the menu action was trying to affect. If the long
... press should have triggered an
9665         * insertion action mode, we can now actually show it.
```

```
9666 */
9667     if (mEditor != null && mEditor.mDiscardNextActionUp && action ==
... MotionEvent.ACTION_UP) {
9668         mEditor.mDiscardNextActionUp = false;
9669
9670         if (mEditor.mIsInsertionActionModeStartPending) {
9671             mEditor.startInsertionActionMode();
9672             mEditor.mIsInsertionActionModeStartPending = false;
9673         }
9674         return superResult;
9675     }
9676
9677     final boolean touchIsFinished = (action ==
... MotionEvent.ACTION_UP)
9678         && (mEditor == null || !mEditor.mIgnoreActionUpEvent) &&
... isFocused());
9679
9680     if ((mMovement != null || onCheckIsTextEditor()) && isEnabled()
9681         && mText instanceof Spannable && mLayout != null) {
9682         boolean handled = false;
9683
9684         if (mMovement != null) {
9685             handled |= mMovement.onTouchEvent(this, (Spannable)
... mText, event);
9686         }
9687
9688         final boolean textIsSelectable = isTextSelectable();
9689         if (touchIsFinished && mLinksClickable && mAutoLinkMask != 0
... && textIsSelectable) {
9690             // The LinkMovementMethod which should handle taps on
... links has not been installed
9691             // on non editable text that support text selection.
9692             // We reproduce its behavior here to open links for
... these.
9693             ClickableSpan[] links = ((Spannable)
... mText).getSpans(getSelectionStart(),
9694                 getSelectionEnd(), ClickableSpan.class);
9695
9696             if (links.length > 0) {
9697                 links[0].onClick(this);
9698                 handled = true;
9699             }
9700         }
9701
9702         if (touchIsFinished && (isTextEditable() ||
... textIsSelectable)) {
9703             // Show the IME, except when selecting in read-only
... text.
9704             final InputMethodManager imm =
... InputMethodManager.peekInstance();
```

```
9705         viewClicked(imm);
9706         if (isTextEditable() && mEditor.mShowSoftInputOnFocus &&
...     imm != null) {
9707             imm.showSoftInput(this, 0);
9708         }
9709
9710         // The above condition ensures that the mEditor is not
...     null
9711         mEditor.onTouchUpEvent(event);
9712
9713         handled = true;
9714     }
9715
9716     if (handled) {
9717         return true;
9718     }
9719 }
9720
9721     return superResult;
9722 }
9723
9724 @Override
9725 public boolean onGenericMotionEvent(MotionEvent event) {
9726     if (mMovement != null && mText instanceof Spannable && mLayout
... != null) {
9727         try {
9728             if (mMovement.onGenericMotionEvent(this, (Spannable)
... mText, event)) {
9729                 return true;
9730             }
9731         } catch (AbstractMethodError ex) {
9732             // onGenericMotionEvent was added to the MovementMethod
... interface in API 12.
9733             // Ignore its absence in case third party applications
... implemented the
9734             // interface directly.
9735         }
9736     }
9737     return super.onGenericMotionEvent(event);
9738 }
9739
9740 @Override
9741 protected void onCreateContextMenu(ContextMenu menu) {
9742     if (mEditor != null) {
9743         mEditor.onCreateContextMenu(menu);
9744     }
9745 }
9746
9747 @Override
9748 public boolean showContextMenu() {
```

```
9749     if (mEditor != null) {
9750         mEditor.setContextMenuAnchor(Float.NaN, Float.NaN);
9751     }
9752     return super.showContextMenu();
9753 }
9754
9755 @Override
9756 public boolean showContextMenu(float x, float y) {
9757     if (mEditor != null) {
9758         mEditor.setContextMenuAnchor(x, y);
9759     }
9760     return super.showContextMenu(x, y);
9761 }
9762
9763 /**
9764  * @return True iff this TextView contains a text that can be
... edited, or if this is
9765  * a selectable TextView.
9766  */
9767 boolean isTextEditable() {
9768     return mText instanceof Editable && onCheckIsTextEditor() &&
... isEnabled();
9769 }
9770
9771 /**
9772  * Returns true, only while processing a touch gesture, if the
... initial
9773  * touch down event caused focus to move to the text view and as a
... result
9774  * its selection changed. Only valid while processing the touch
... gesture
9775  * of interest, in an editable text view.
9776  */
9777 public boolean didTouchFocusSelect() {
9778     return mEditor != null && mEditor.mTouchFocusSelected;
9779 }
9780
9781 @Override
9782 public void cancelLongPress() {
9783     super.cancelLongPress();
9784     if (mEditor != null) mEditor.mIgnoreActionUpEvent = true;
9785 }
9786
9787 @Override
9788 public boolean onTrackballEvent(MotionEvent event) {
9789     if (mMovement != null && mText instanceof Spannable && mLayout
... != null) {
9790         if (mMovement.onTrackballEvent(this, (Spannable) mText,
... event)) {
9791             return true;
```

```
9792     }
9793     }
9794
9795     return super.onTrackballEvent(event);
9796 }
9797
9798 /**
9799  * Sets the Scroller used for producing a scrolling animation
9800  *
9801  * @param s A Scroller instance
9802  */
9803 public void setScroller(Scroller s) {
9804     mScroller = s;
9805 }
9806
9807 @Override
9808 protected float getLeftFadingEdgeStrength() {
9809     if (isMarqueeFadeEnabled() && mMarquee != null &&
9810     ... !mMarquee.isStopped()) {
9811         final Marquee marquee = mMarquee;
9812         if (marquee.shouldDrawLeftFade()) {
9813             return
9814     ... getHorizontalFadingEdgeStrength(marquee.getScroll(), 0.0f);
9815         } else {
9816             return 0.0f;
9817         }
9818     } else if (getLineCount() == 1) {
9819         final float lineLeft = getLayout().getLineLeft(0);
9820         if (lineLeft > mScrollX) return 0.0f;
9821         return getHorizontalFadingEdgeStrength(mScrollX, lineLeft);
9822     }
9823     return super.getLeftFadingEdgeStrength();
9824 }
9825
9826 @Override
9827 protected float getRightFadingEdgeStrength() {
9828     if (isMarqueeFadeEnabled() && mMarquee != null &&
9829     ... !mMarquee.isStopped()) {
9830         final Marquee marquee = mMarquee;
9831         return
9832     ... getHorizontalFadingEdgeStrength(marquee.getMaxFadeScroll(),
9833     ... marquee.getScroll());
9834     } else if (getLineCount() == 1) {
9835         final float rightEdge = mScrollX +
9836     ... (getWidth() - getCompoundPaddingLeft() -
9837     ... getCompoundPaddingRight());
9838         final float lineRight = getLayout().getLineRight(0);
9839         if (lineRight < rightEdge) return 0.0f;
9840         return getHorizontalFadingEdgeStrength(rightEdge,
9841     ... lineRight);
```

```
9835     }
9836     return super.getRightFadingEdgeStrength();
9837 }
9838
9839 /**
9840  * Calculates the fading edge strength as the ratio of the distance
... between two
9841  * horizontal positions to {@link
... View#getHorizontalFadingEdgeLength()}. Uses the absolute
9842  * value for the distance calculation.
9843  *
9844  * @param position1 A horizontal position.
9845  * @param position2 A horizontal position.
9846  * @return Fading edge strength between [0.0f, 1.0f].
9847  */
9848 @FloatRange(from = 0.0, to = 1.0)
9849 private float getHorizontalFadingEdgeStrength(float position1, float
... position2) {
9850     final int horizontalFadingEdgeLength =
... getHorizontalFadingEdgeLength();
9851     if (horizontalFadingEdgeLength == 0) return 0.0f;
9852     final float diff = Math.abs(position1 - position2);
9853     if (diff > horizontalFadingEdgeLength) return 1.0f;
9854     return diff / horizontalFadingEdgeLength;
9855 }
9856
9857 private boolean isMarqueeFadeEnabled() {
9858     return mEllipsize == TextUtils.TruncateAt.MARQUEE
9859         && mMarqueeFadeMode !=
... MARQUEE_FADE_SWITCH_SHOW_ELLIPSIS;
9860 }
9861
9862 @Override
9863 protected int computeHorizontalScrollRange() {
9864     if (mLayout != null) {
9865         return mSingleLine && (mGravity &
... Gravity.HORIZONTAL_GRAVITY_MASK) == Gravity.LEFT
9866             ? (int) mLayout.getLineWidth(0) :
... mLayout.getWidth();
9867     }
9868
9869     return super.computeHorizontalScrollRange();
9870 }
9871
9872 @Override
9873 protected int computeVerticalScrollRange() {
9874     if (mLayout != null) {
9875         return mLayout.getHeight();
9876     }
9877     return super.computeVerticalScrollRange();
```

```
9878     }
9879
9880     @Override
9881     protected int computeVerticalScrollExtent() {
9882         return getHeight() - getCompoundPaddingTop() -
... getCompoundPaddingBottom();
9883     }
9884
9885     @Override
9886     public void findViewsWithText(ArrayList<View> outViews, CharSequence
... searched, int flags) {
9887         super.findViewsWithText(outViews, searched, flags);
9888         if (!outViews.contains(this) && (flags & FIND_VIEWS_WITH_TEXT)
... != 0
9889             && !TextUtils.isEmpty(searched) &&
... !TextUtils.isEmpty(mText)) {
9890             String searchedLowerCase =
... searched.toString().toLowerCase();
9891             String textLowerCase = mText.toString().toLowerCase();
9892             if (textLowerCase.contains(searchedLowerCase)) {
9893                 outViews.add(this);
9894             }
9895         }
9896     }
9897
9898     /**
9899     * Type of the text buffer that defines the characteristics of the
... text such as static,
9900     * styleable, or editable.
9901     */
9902     public enum BufferType {
9903         NORMAL, SPANNABLE, EDITABLE
9904     }
9905
9906     /**
9907     * Returns the TextView_textColor attribute from the TypedArray, if
... set, or
9908     * the TextAppearance_textColor from the TextView_textAppearance
... attribute,
9909     * if TextView_textColor was not set directly.
9910     *
9911     * @removed
9912     */
9913     public static ColorStateList getTextColors(Context context,
... TypedArray attrs) {
9914         if (attrs == null) {
9915             // Preserve behavior prior to removal of this API.
9916             throw new NullPointerException();
9917         }
9918
```

```
9919 // It's not safe to use this method from apps. The parameter
... 'attrs'
9920 // must have been obtained using the TextView filter array which
... is not
9921 // available to the SDK. As such, we grab a default TypedArray
... with the
9922 // right filter instead here.
9923 final TypedArray a =
... context.obtainStyledAttributes(R.styleable.TextView);
9924 ColorStateList colors =
... a.getColorStateList(R.styleable.TextView_textColor);
9925 if (colors == null) {
9926     final int ap =
... a.getResourceId(R.styleable.TextView_textAppearance, 0);
9927     if (ap != 0) {
9928         final TypedArray appearance =
... context.obtainStyledAttributes(
9929             ap, R.styleable.TextAppearance);
9930         colors =
... appearance.getColorStateList(R.styleable.TextAppearance_textColor);
9931         appearance.recycle();
9932     }
9933 }
9934 a.recycle();
9935
9936 return colors;
9937 }
9938
9939 /**
9940  * Returns the default color from the TextView_textColor attribute
... from the
9941  * AttributeSet, if set, or the default color from the
9942  * TextAppearance_textColor from the TextView_textAppearance
... attribute, if
9943  * TextView_textColor was not set directly.
9944  *
9945  * @removed
9946  */
9947 public static int getTextColor(Context context, TypedArray attrs,
... int def) {
9948     final ColorStateList colors = getTextColor(context, attrs);
9949     if (colors == null) {
9950         return def;
9951     } else {
9952         return colors.getDefaultColor();
9953     }
9954 }
9955
9956 @Override
9957 public boolean onKeyShortcut(int keyCode, KeyEvent event) {
```



```
9958     if (event.hasModifiers(KeyEvent.META_CTRL_ON)) {
9959         // Handle Ctrl-only shortcuts.
9960         switch (keyCode) {
9961             case KeyEvent.KEYCODE_A:
9962                 if (canSelectText()) {
9963                     return onTextContextMenuItem(ID_SELECT_ALL);
9964                 }
9965                 break;
9966             case KeyEvent.KEYCODE_Z:
9967                 if (canUndo()) {
9968                     return onTextContextMenuItem(ID_UNDO);
9969                 }
9970                 break;
9971             case KeyEvent.KEYCODE_X:
9972                 if (canCut()) {
9973                     return onTextContextMenuItem(ID_CUT);
9974                 }
9975                 break;
9976             case KeyEvent.KEYCODE_C:
9977                 if (canCopy()) {
9978                     return onTextContextMenuItem(ID_COPY);
9979                 }
9980                 break;
9981             case KeyEvent.KEYCODE_V:
9982                 if (canPaste()) {
9983                     return onTextContextMenuItem(ID_PASTE);
9984                 }
9985                 break;
9986         }
9987     } else if (event.hasModifiers(KeyEvent.META_CTRL_ON |
... KeyEvent.META_SHIFT_ON)) {
9988         // Handle Ctrl-Shift shortcuts.
9989         switch (keyCode) {
9990             case KeyEvent.KEYCODE_Z:
9991                 if (canRedo()) {
9992                     return onTextContextMenuItem(ID_REDO);
9993                 }
9994                 break;
9995             case KeyEvent.KEYCODE_V:
9996                 if (canPaste()) {
9997                     return
... onTextContextMenuItem(ID_PASTE_AS_PLAIN_TEXT);
9998                 }
9999         }
10000     }
10001     return super.onKeyShortcut(keyCode, event);
10002 }
10003
10004 /**
10005  * Unlike {@link #textCanBeSelected()}, this method is based on the
```

```
10005... <i>current</i> state of the
10006     * TextView. {@link #textCanBeSelected()} has to be true (this is
... one of the conditions to have
10007     * a selection controller (see {@link
... Editor#prepareCursorControllers()}), but this is not
10008     * sufficient.
10009     */
10010     boolean canSelectText() {
10011         return mText.length() != 0 && mEditor != null &&
... mEditor.hasSelectionController();
10012     }
10013
10014     /**
10015     * Test based on the <i>intrinsic</i> characteristics of the
... TextView.
10016     * The text must be spannable and the movement method must allow for
... arbitrary selection.
10017     *
10018     * See also {@link #canSelectText()}.
10019     */
10020     boolean textCanBeSelected() {
10021         // prepareCursorController() relies on this method.
10022         // If you change this condition, make sure
... prepareCursorController is called anywhere
10023         // the value of this condition might be changed.
10024         if (mMovement == null || !mMovement.canSelectArbitrarily())
... return false;
10025         return isTextEditable()
10026             || (isTextSelectable() && mText instanceof Spannable &&
... isEnabled());
10027     }
10028
10029     private Locale getTextServicesLocale(boolean allowNullLocale) {
10030         // Start fetching the text services locale asynchronously.
10031         updateTextServicesLocaleAsync();
10032         // If !allowNullLocale and there is no cached text services
... locale, just return the default
10033         // locale.
10034         return (mCurrentSpellCheckerLocaleCache == null &&
... !allowNullLocale) ? Locale.getDefault()
10035             : mCurrentSpellCheckerLocaleCache;
10036     }
10037
10038     /**
10039     * This is a temporary method. Future versions may support
... multi-locale text.
10040     * Caveat: This method may not return the latest text services
... locale, but this should be
10041     * acceptable and it's more important to make this method
... asynchronous.
```

```
10042 *
10043 * @return The locale that should be used for a word iterator
10044 * in this TextView, based on the current spell checker settings,
10045 * the current IME's locale, or the system default locale.
10046 * Please note that a word iterator in this TextView is different
... from another word iterator
10047 * used by SpellChecker.java of TextView. This method should be used
... for the former.
10048 * @hide
10049 */
10050 // TODO: Support multi-locale
10051 // TODO: Update the text services locale immediately after the
... keyboard locale is switched
10052 // by catching intent of keyboard switch event
10053 public Locale getTextServicesLocale() {
10054     return getTextServicesLocale(false /* allowNullLocale */);
10055 }
10056
10057 /**
10058 * @return {@code true} if this TextView is specialized for showing
... and interacting with the
10059 * extracted text in a full-screen input method.
10060 * @hide
10061 */
10062 public boolean isInExtractedMode() {
10063     return false;
10064 }
10065
10066 /**
10067 * @return {@code true} if this widget supports auto-sizing text and
... has been configured to
10068 * auto-size.
10069 */
10070 private boolean isAutoSizeEnabled() {
10071     return supportsAutoSizeText() && mAutoSizeTextType !=
... AUTO_SIZE_TEXT_TYPE_NONE;
10072 }
10073
10074 /**
10075 * @return {@code true} if this TextView supports auto-sizing text
... to fit within its container.
10076 * @hide
10077 */
10078 protected boolean supportsAutoSizeText() {
10079     return true;
10080 }
10081
10082 /**
10083 * This is a temporary method. Future versions may support
... multi-locale text.
```

```
10084 * Caveat: This method may not return the latest spell checker
... locale, but this should be
10085 * acceptable and it's more important to make this method
... asynchronous.
10086 *
10087 * @return The locale that should be used for a spell checker in
... this TextView,
10088 * based on the current spell checker settings, the current IME's
... locale, or the system default
10089 * locale.
10090 * @hide
10091 */
10092 public Locale getSpellCheckerLocale() {
10093     return getTextServicesLocale(true /* allowNullLocale */);
10094 }
10095
10096 private void updateTextServicesLocaleAsync() {
10097     // AsyncTask.execute() uses a serial executor which means we
... don't have
10098     // to lock around updateTextServicesLocaleLocked() to prevent it
... from
10099     // being executed n times in parallel.
10100     AsyncTask.execute(new Runnable() {
10101         @Override
10102         public void run() {
10103             updateTextServicesLocaleLocked();
10104         }
10105     });
10106 }
10107
10108 private void updateTextServicesLocaleLocked() {
10109     final TextServicesManager textServicesManager =
... (TextServicesManager)
10110
... mContext.getSystemService(Context.TEXT_SERVICES_MANAGER_SERVICE);
10111     final SpellCheckerSubtype subtype =
... textServicesManager.getCurrentSpellCheckerSubtype(true);
10112     final Locale locale;
10113     if (subtype != null) {
10114         locale = subtype.getLocaleObject();
10115     } else {
10116         locale = null;
10117     }
10118     mCurrentSpellCheckerLocaleCache = locale;
10119 }
10120
10121 void onLocaleChanged() {
10122     mEditor.onLocaleChanged();
10123 }
10124
```

```
10125     /**
10126     * This method is used by the ArrowKeyMovementMethod to jump from
... one word to the other.
10127     * Made available to achieve a consistent behavior.
10128     * @hide
10129     */
10130     public WordIterator getWordIterator() {
10131         if (mEditor != null) {
10132             return mEditor.getWordIterator();
10133         } else {
10134             return null;
10135         }
10136     }
10137
10138     /** @hide */
10139     @Override
10140     public void onPopulateAccessibilityEventInternal(AccessibilityEvent
... event) {
10141         super.onPopulateAccessibilityEventInternal(event);
10142
10143         final CharSequence text = getTextForAccessibility();
10144         if (!TextUtils.isEmpty(text)) {
10145             event.getText().add(text);
10146         }
10147     }
10148
10149     @Override
10150     public CharSequence getAccessibilityClassName() {
10151         return TextView.class.getName();
10152     }
10153
10154     @Override
10155     public void onProvideStructure(ViewStructure structure) {
10156         super.onProvideStructure(structure);
10157         onProvideAutoStructureForAssistOrAutofill(structure, false);
10158     }
10159
10160     @Override
10161     public void onProvideAutofillStructure(ViewStructure structure, int
... flags) {
10162         super.onProvideAutofillStructure(structure, flags);
10163         onProvideAutoStructureForAssistOrAutofill(structure, true);
10164     }
10165
10166     private void onProvideAutoStructureForAssistOrAutofill(ViewStructure
... structure,
10167         boolean forAutofill) {
10168         final boolean isPassword = hasPasswordTransformationMethod()
10169             || isPasswordInputType(getInputType());
10170         if (forAutofill) {
```

```
10171     structure.setDataIsSensitive(!mTextFromResource);
10172     }
10173
10174     if (!isPassword || forAutofill) {
10175         if (mLayout == null) {
10176             assumeLayout();
10177         }
10178         Layout layout = mLayout;
10179         final int lineCount = layout.getLineCount();
10180         if (lineCount <= 1) {
10181             // Simple case: this is a single line.
10182             final CharSequence text = getText();
10183             if (forAutofill) {
10184                 structure.setText(text);
10185             } else {
10186                 structure.setText(text, getSelectionStart(),
10187 ... getSelectionEnd());
10188             }
10189         } else {
10190             // Complex case: multi-line, could be scrolled or within
10191 ... a scroll container
10192             // so some lines are not visible.
10193             final int[] tmpCords = new int[2];
10194             getLocationInWindow(tmpCords);
10195             final int topWindowLocation = tmpCords[1];
10196             View root = this;
10197             ViewParent viewParent = getParent();
10198             while (viewParent instanceof View) {
10199                 root = (View) viewParent;
10200                 viewParent = root.getParent();
10201             }
10202             final int windowHeight = root.getHeight();
10203             final int topLine;
10204             final int bottomLine;
10205             if (topWindowLocation >= 0) {
10206                 // The top of the view is fully within its window;
10207 ... start text at line 0.
10208                 topLine = getLineAtCoordinateUnclamped(0);
10209                 bottomLine =
10210 ... getLineAtCoordinateUnclamped(windowHeight - 1);
10211             } else {
10212                 // The top of hte window has scrolled off the top of
10213 ... the window; figure out
10214                 // the starting line for this.
10215                 topLine =
10216 ... getLineAtCoordinateUnclamped(-topWindowLocation);
10217                 bottomLine =
10218 ... getLineAtCoordinateUnclamped(windowHeight - 1 - topWindowLocation);
10219             }
10220             // We want to return some contextual lines above/below
```

```

10213... the lines that are
10214         // actually visible.
10215         int expandedTopLine = topLine - (bottomLine - topLine) /
... 2;
10216         if (expandedTopLine < 0) {
10217             expandedTopLine = 0;
10218         }
10219         int expandedBottomLine = bottomLine + (bottomLine -
... topLine) / 2;
10220         if (expandedBottomLine >= lineCount) {
10221             expandedBottomLine = lineCount - 1;
10222         }
10223
10224         // Convert lines into character offsets.
10225         int expandedTopChar =
... layout.getLineStart(expandedTopLine);
10226         int expandedBottomChar =
... layout.getLineEnd(expandedBottomLine);
10227
10228         // Take into account selection -- if there is a
... selection, we need to expand
10229         // the text we are returning to include that selection.
10230         final int selStart = getSelectionStart();
10231         final int selEnd = getSelectionEnd();
10232         if (selStart < selEnd) {
10233             if (selStart < expandedTopChar) {
10234                 expandedTopChar = selStart;
10235             }
10236             if (selEnd > expandedBottomChar) {
10237                 expandedBottomChar = selEnd;
10238             }
10239         }
10240
10241         // Get the text and trim it to the range we are
... reporting.
10242         CharSequence text = getText();
10243         if (expandedTopChar > 0 || expandedBottomChar <
... text.length()) {
10244             text = text.subSequence(expandedTopChar,
... expandedBottomChar);
10245         }
10246
10247         if (forAutofill) {
10248             structure.setText(text);
10249         } else {
10250             structure.setText(text, selStart - expandedTopChar,
... selEnd - expandedTopChar);
10251
10252         final int[] lineOffsets = new int[bottomLine -
... topLine + 1];

```

```
10253         final int[] lineBaselines = new int[bottomLine -
... topLine + 1];
10254         final int baselineOffset = getBaselineOffset();
10255         for (int i = topLine; i <= bottomLine; i++) {
10256             lineOffsets[i - topLine] =
... layout.getLineStart(i);
10257             lineBaselines[i - topLine] =
... layout.getLineBaseline(i) + baselineOffset;
10258         }
10259         structure.setTextLines(lineOffsets, lineBaselines);
10260     }
10261 }
10262
10263     if (!forAutofill) {
10264         // Extract style information that applies to the
... TextView as a whole.
10265         int style = 0;
10266         int typefaceStyle = getTypefaceStyle();
10267         if ((typefaceStyle & Typeface.BOLD) != 0) {
10268             style |= AssistStructure.ViewNode.TEXT_STYLE_BOLD;
10269         }
10270         if ((typefaceStyle & Typeface.ITALIC) != 0) {
10271             style |= AssistStructure.ViewNode.TEXT_STYLE_ITALIC;
10272         }
10273
10274         // Global styles can also be set via
... TextView.setPaintFlags().
10275         int paintFlags = mTextPaint.getFlags();
10276         if ((paintFlags & Paint.FAKE_BOLD_TEXT_FLAG) != 0) {
10277             style |= AssistStructure.ViewNode.TEXT_STYLE_BOLD;
10278         }
10279         if ((paintFlags & Paint.UNDERLINE_TEXT_FLAG) != 0) {
10280             style |=
... AssistStructure.ViewNode.TEXT_STYLE_UNDERLINE;
10281         }
10282         if ((paintFlags & Paint.STRIKE_THRU_TEXT_FLAG) != 0) {
10283             style |=
... AssistStructure.ViewNode.TEXT_STYLE_STRIKE_THRU;
10284         }
10285
10286         // TextView does not have its own text background color.
... A background is either part
10287         // of the View (and can be any drawable) or a
... BackgroundColorSpan inside the text.
10288         structure.setTextStyle(getTextSize(),
... getCurrentTextColor(),
10289         AssistStructure.ViewNode.TEXT_COLOR_UNDEFINED /*
... bgColor */, style);
10290     }
10291 }
```



```
10292     structure.setHint(getHint());
10293     structure.setInputType(getInputType());
10294 }
10295
10296     boolean canRequestAutofill() {
10297         if (!isAutofillable()) {
10298             return false;
10299         }
10300         final AutofillManager afm =
... mContext.getSystemService(AutofillManager.class);
10301         if (afm != null) {
10302             return afm.isEnabled();
10303         }
10304         return false;
10305     }
10306
10307     private void requestAutofill() {
10308         final AutofillManager afm =
... mContext.getSystemService(AutofillManager.class);
10309         if (afm != null) {
10310             afm.requestAutofill(this);
10311         }
10312     }
10313
10314     @Override
10315     public void autofill(AutofillValue value) {
10316         if (!value.isText() || !isTextEditable()) {
10317             Log.w(LOG_TAG, value + " could not be autofilled into " +
... this);
10318             return;
10319         }
10320
10321         setText(value.getTextValue(), mBufferType, true, 0);
10322     }
10323
10324     @Override
10325     public @AutofillType int getAutofillType() {
10326         return isTextEditable() ? AUTOFILL_TYPE_TEXT :
... AUTOFILL_TYPE_NONE;
10327     }
10328
10329     @Override
10330     @Nullable
10331     public AutofillValue getAutofillValue() {
10332         return isTextEditable() ? AutofillValue.forText(getText()) :
... null;
10333     }
10334
10335     /** @hide */
10336     @Override
```

```
10337 public void
... onInitializeAccessibilityEventInternal(AccessibilityEvent event) {
10338     super.onInitializeAccessibilityEventInternal(event);
10339
10340     final boolean isPassword = hasPasswordTransformationMethod();
10341     event.setPassword(isPassword);
10342
10343     if (event.getEventType() ==
... AccessibilityEvent.TYPE_VIEW_TEXT_SELECTION_CHANGED) {
10344         event.setFromIndex(Selection.getSelectionStart(mText));
10345         event.setToIndex(Selection.getSelectionEnd(mText));
10346         event.setItemCount(mText.length());
10347     }
10348 }
10349
10350 /** @hide */
10351 @Override
10352 public void
... onInitializeAccessibilityNodeInfoInternal(AccessibilityNodeInfo info) {
10353     super.onInitializeAccessibilityNodeInfoInternal(info);
10354
10355     final boolean isPassword = hasPasswordTransformationMethod();
10356     info.setPassword(isPassword);
10357     info.setText(getTextForAccessibility());
10358     info.setHintText(mHint);
10359     info.setShowingHintText(isShowingHint());
10360
10361     if (mBufferType == BufferType.EDITABLE) {
10362         info.setEditable(true);
10363         if (isEnabled()) {
10364
... info.addAction(AccessibilityNodeInfo.AccessibilityAction.ACTION_SET_TEXT
... );
10365     }
10366 }
10367
10368     if (mEditor != null) {
10369         info.setInputType(mEditor.mInputType);
10370
10371         if (mEditor.mError != null) {
10372             info.setContentInvalid(true);
10373             info.setError(mEditor.mError);
10374         }
10375     }
10376
10377     if (!TextUtils.isEmpty(mText)) {
10378
... info.addAction(AccessibilityNodeInfo.ACTION_NEXT_AT_MOVEMENT_GRANULARITY
... );
10379
```

```

10379... info.addAction(AccessibilityNodeInfo.
... ACTION_PREVIOUS_AT_MOVEMENT_GRANULARITY);
10380
... info.setMovementGranularities(AccessibilityNodeInfo.
... MOVEMENT_GRANULARITY_CHARACTER
10381         | AccessibilityNodeInfo.MOVEMENT_GRANULARITY_WORD
10382         | AccessibilityNodeInfo.MOVEMENT_GRANULARITY_LINE
10383         |
... AccessibilityNodeInfo.MOVEMENT_GRANULARITY_PARAGRAPH
10384         | AccessibilityNodeInfo.MOVEMENT_GRANULARITY_PAGE);
10385     info.addAction(AccessibilityNodeInfo.ACTION_SET_SELECTION);
10386     info.setAvailableExtraData(
10387
... Arrays.asList(EXTRA_DATA_TEXT_CHARACTER_LOCATION_KEY));
10388     }
10389
10390     if (isFocused()) {
10391         if (canCopy()) {
10392             info.addAction(AccessibilityNodeInfo.ACTION_COPY);
10393         }
10394         if (canPaste()) {
10395             info.addAction(AccessibilityNodeInfo.ACTION_PASTE);
10396         }
10397         if (canCut()) {
10398             info.addAction(AccessibilityNodeInfo.ACTION_CUT);
10399         }
10400         if (canShare()) {
10401             info.addAction(new
... AccessibilityNodeInfo.AccessibilityAction(
10402                 ACCESSIBILITY_ACTION_SHARE,
10403
... getResources().getString(com.android.internal.R.string.share));
10404         }
10405         if (canProcessText()) { // also implies mEditor is not
... null.
10406
... mEditor.mProcessTextIntentActionsHandler.
... onInitializeAccessibilityNodeInfo(info);
10407     }
10408 }
10409
10410 // Check for known input filter types.
10411 final int numFilters = mFilters.length;
10412 for (int i = 0; i < numFilters; i++) {
10413     final InputFilter filter = mFilters[i];
10414     if (filter instanceof InputFilter.LengthFilter) {
10415         info.setMaxTextLength(((InputFilter.LengthFilter)
... filter).getMax());
10416     }
10417 }

```

```
10418
10419     if (!isSingleLine()) {
10420         info.setMultiLine(true);
10421     }
10422 }
10423
10424 @Override
10425 public void addExtraDataToAccessibilityNodeInfo(
10426     AccessibilityNodeInfo info, String extraDataKey, Bundle
... arguments) {
10427     // The only extra data we support requires arguments.
10428     if (arguments == null) {
10429         return;
10430     }
10431     if (extraDataKey.equals(EXTRA_DATA_TEXT_CHARACTER_LOCATION_KEY))
... {
10432         int positionInfoStartIndex = arguments.getInt(
10433             EXTRA_DATA_TEXT_CHARACTER_LOCATION_ARG_START_INDEX,
... -1);
10434         int positionInfoLength = arguments.getInt(
10435             EXTRA_DATA_TEXT_CHARACTER_LOCATION_ARG_LENGTH, -1);
10436         if ((positionInfoLength <= 0) || (positionInfoStartIndex <
... 0)
10437             || (positionInfoStartIndex >= mText.length())) {
10438             Log.e(LOG_TAG, "Invalid arguments for accessibility
... character locations");
10439             return;
10440         }
10441         RectF[] boundingRects = new RectF[positionInfoLength];
10442         final CursorAnchorInfo.Builder builder = new
... CursorAnchorInfo.Builder();
10443         populateCharacterBounds(builder, positionInfoStartIndex,
10444             positionInfoStartIndex + positionInfoLength,
10445             viewportToContentHorizontalOffset(),
... viewportToContentVerticalOffset());
10446         CursorAnchorInfo cursorAnchorInfo =
... builder.setMatrix(null).build();
10447         for (int i = 0; i < positionInfoLength; i++) {
10448             int flags =
... cursorAnchorInfo.getCharacterBoundsFlags(positionInfoStartIndex + i);
10449             if ((flags & FLAG_HAS_VISIBLE_REGION) ==
... FLAG_HAS_VISIBLE_REGION) {
10450                 RectF bounds = cursorAnchorInfo
10451                     .getCharacterBounds(positionInfoStartIndex +
... i);
10452                 if (bounds != null) {
10453                     mapRectFromViewToScreenCoords(bounds, true);
10454                     boundingRects[i] = bounds;
10455                 }
10456             }
... }
```

```
10457     }
10458     info.getExtras().putParcelableArray(extraDataKey,
... boundingRects);
10459     }
10460 }
10461
10462 /**
10463  * Populate requested character bounds in a {@link
... CursorAnchorInfo.Builder}
10464  *
10465  * @param builder The builder to populate
10466  * @param startIndex The starting character index to populate
10467  * @param endIndex The ending character index to populate
10468  * @param viewportToContentHorizontalOffset The horizontal offset
... from the viewport to the
10469  * content
10470  * @param viewportToContentVerticalOffset The vertical offset from
... the viewport to the content
10471  * @hide
10472  */
10473 public void populateCharacterBounds(CursorAnchorInfo.Builder
... builder,
10474     int startIndex, int endIndex, float
... viewportToContentHorizontalOffset,
10475     float viewportToContentVerticalOffset) {
10476     final int minLine = mLayout.getLineForOffset(startIndex);
10477     final int maxLine = mLayout.getLineForOffset(endIndex - 1);
10478     for (int line = minLine; line <= maxLine; ++line) {
10479         final int lineStart = mLayout.getLineStart(line);
10480         final int lineEnd = mLayout.getLineEnd(line);
10481         final int offsetStart = Math.max(lineStart, startIndex);
10482         final int offsetEnd = Math.min(lineEnd, endIndex);
10483         final boolean ltrLine =
10484             mLayout.getParagraphDirection(line) ==
... Layout.DIR_LEFT_TO_RIGHT;
10485         final float[] widths = new float[offsetEnd - offsetStart];
10486         mLayout.getPaint().getTextWidths(mText, offsetStart,
... offsetEnd, widths);
10487         final float top = mLayout.getLineTop(line);
10488         final float bottom = mLayout.getLineBottom(line);
10489         for (int offset = offsetStart; offset < offsetEnd; ++offset)
... {
10490             final float charWidth = widths[offset - offsetStart];
10491             final boolean isRtl = mLayout.isRtlCharAt(offset);
10492             final float primary =
... mLayout.getPrimaryHorizontal(offset);
10493             final float secondary =
... mLayout.getSecondaryHorizontal(offset);
10494             // TODO: This doesn't work perfectly for text with
... custom styles and
```

```

10495 // TAB chars.
10496 final float left;
10497 final float right;
10498 if (ltrLine) {
10499     if (isRtl) {
10500         left = secondary - charWidth;
10501         right = secondary;
10502     } else {
10503         left = primary;
10504         right = primary + charWidth;
10505     }
10506 } else {
10507     if (!isRtl) {
10508         left = secondary;
10509         right = secondary + charWidth;
10510     } else {
10511         left = primary - charWidth;
10512         right = primary;
10513     }
10514 }
10515 // TODO: Check top-right and bottom-left as well.
10516 final float localLeft = left +
... viewportToContentHorizontalOffset;
10517 final float localRight = right +
... viewportToContentHorizontalOffset;
10518 final float localTop = top +
... viewportToContentVerticalOffset;
10519 final float localBottom = bottom +
... viewportToContentVerticalOffset;
10520 final boolean isTopLeftVisible =
... isPositionVisible(localLeft, localTop);
10521 final boolean isBottomRightVisible =
... isPositionVisible(localRight, localBottom);
10522 int characterBoundsFlags = 0;
10523 if (isTopLeftVisible || isBottomRightVisible) {
10524     characterBoundsFlags |= FLAG_HAS_VISIBLE_REGION;
10525 }
10526 if (!isTopLeftVisible || !isBottomRightVisible) {
10527     characterBoundsFlags |=
... CursorAnchorInfo.FLAG_HAS_INVISIBLE_REGION;
10528 }
10529 if (isRtl) {
10530     characterBoundsFlags |=
... CursorAnchorInfo.FLAG_IS_RTL;
10531 }
10532 // Here offset is the index in Java chars.
10533 builder.addCharacterBounds(offset, localLeft, localTop,
... localRight,
10534                             localBottom, characterBoundsFlags);
10535 }
10536

```

```
10537     }
10538 }
10539
10540 /**
10541  * @hide
10542  */
10543 public boolean isPositionVisible(final float positionX, final float
... positionY) {
10544     synchronized (TEMP_POSITION) {
10545         final float[] position = TEMP_POSITION;
10546         position[0] = positionX;
10547         position[1] = positionY;
10548         View view = this;
10549
10550         while (view != null) {
10551             if (view != this) {
10552                 // Local scroll is already taken into account in
... positionX/Y
10553                 position[0] -= view.getScrollX();
10554                 position[1] -= view.getScrollY();
10555             }
10556
10557             if (position[0] < 0 || position[1] < 0 || position[0] >
... view.getWidth()
10558                 || position[1] > view.getHeight()) {
10559                 return false;
10560             }
10561
10562             if (!view.getMatrix().isIdentity()) {
10563                 view.getMatrix().mapPoints(position);
10564             }
10565
10566             position[0] += view.getLeft();
10567             position[1] += view.getTop();
10568
10569             final ViewParent parent = view.getParent();
10570             if (parent instanceof View) {
10571                 view = (View) parent;
10572             } else {
10573                 // We've reached the ViewRoot, stop iterating
10574                 view = null;
10575             }
10576         }
10577     }
10578
10579     // We've been able to walk up the view hierarchy and the
... position was never clipped
10580     return true;
10581 }
10582
```

```
10583     /**
10584     * Performs an accessibility action after it has been offered to the
10585     * delegate.
10586     *
10587     * @hide
10588     */
10589     @Override
10590     public boolean performAccessibilityActionInternal(int action, Bundle
... arguments) {
10591         if (mEditor != null
10592             &&
... mEditor.mProcessTextIntentActionsHandler.performAccessibilityAction(
... action)) {
10593             return true;
10594         }
10595         switch (action) {
10596             case AccessibilityNodeInfo.ACTION_CLICK: {
10597                 return performAccessibilityActionClick(arguments);
10598             }
10599             case AccessibilityNodeInfo.ACTION_COPY: {
10600                 if (isFocused() && canCopy()) {
10601                     if (onTextContextMenuItem(ID_COPY)) {
10602                         return true;
10603                     }
10604                 }
10605             } return false;
10606             case AccessibilityNodeInfo.ACTION_PASTE: {
10607                 if (isFocused() && canPaste()) {
10608                     if (onTextContextMenuItem(ID_PASTE)) {
10609                         return true;
10610                     }
10611                 }
10612             } return false;
10613             case AccessibilityNodeInfo.ACTION_CUT: {
10614                 if (isFocused() && canCut()) {
10615                     if (onTextContextMenuItem(ID_CUT)) {
10616                         return true;
10617                     }
10618                 }
10619             } return false;
10620             case AccessibilityNodeInfo.ACTION_SET_SELECTION: {
10621                 ensureIterableTextForAccessibilitySelectable();
10622                 CharSequence text = getIterableTextForAccessibility();
10623                 if (text == null) {
10624                     return false;
10625                 }
10626                 final int start = (arguments != null) ?
... arguments.getInt(
10627
... AccessibilityNodeInfo.ACTION_ARGUMENT_SELECTION_START_INT, -1) : -1;
```



```
10628         final int end = (arguments != null) ? arguments.getInt(
10629
10630     ... AccessibilityNodeInfo.ACTION_ARGUMENT_SELECTION_END_INT, -1) : -1;
10631         if ((getSelectionStart() != start || getSelectionEnd()
10632     ... != end)) {
10633             // No arguments clears the selection.
10634             if (start == end && end == -1) {
10635                 Selection.removeSelection((Spannable) text);
10636                 return true;
10637             }
10638             if (start >= 0 && start <= end && end <=
10639     ... text.length()) {
10640                 Selection.setSelection((Spannable) text, start,
10641     ... end);
10642                 // Make sure selection mode is engaged.
10643                 if (mEditor != null) {
10644                     mEditor.startSelectionModeAsync(false);
10645                 }
10646                 return true;
10647             }
10648         }
10649     } return false;
10650     case
10651     ... AccessibilityNodeInfo.ACTION_NEXT_AT_MOVEMENT_GRANULARITY:
10652     case
10653     ... AccessibilityNodeInfo.ACTION_PREVIOUS_AT_MOVEMENT_GRANULARITY: {
10654         ensureIterableTextForAccessibilitySelectable();
10655         return super.performAccessibilityActionInternal(action,
10656     ... arguments);
10657     }
10658     case ACCESSIBILITY_ACTION_SHARE: {
10659         if (isFocused() && canShare()) {
10660             if (onTextContextMenuItem(ID_SHARE)) {
10661                 return true;
10662             }
10663         }
10664     } return false;
10665     case AccessibilityNodeInfo.ACTION_SET_TEXT: {
10666         if (!isEnabled() || (mBufferType !=
10667     ... BufferType.EDITABLE)) {
10668             return false;
10669         }
10670         CharSequence text = (arguments != null) ?
10671     ... arguments.getCharSequence(
10672     ... AccessibilityNodeInfo.ACTION_ARGUMENT_SET_TEXT_CHARSEQUENCE) : null;
10673         setText(text);
10674         if (mText != null) {
10675             int updatedTextLength = mText.length();
```

```
10667         if (updatedTextLength > 0) {
10668             Selection.setSelection((Spannable) mText,
... updatedTextLength);
10669         }
10670     }
10671     } return true;
10672     default: {
10673         return super.performAccessibilityActionInternal(action,
... arguments);
10674     }
10675 }
10676 }
10677
10678 private boolean performAccessibilityActionClick(Bundle arguments) {
10679     boolean handled = false;
10680
10681     if (!isEnabled()) {
10682         return false;
10683     }
10684
10685     if (isClickable() || isLongClickable()) {
10686         // Simulate View.onTouchEvent for an ACTION_UP event
10687         if (isFocusable() && !isFocused()) {
10688             requestFocus();
10689         }
10690
10691         performClick();
10692         handled = true;
10693     }
10694
10695     // Show the IME, except when selecting in read-only text.
10696     if ((mMovement != null || onCheckIsTextEditor()) &&
... hasSpannableText() && mLayout != null
10697         && (isTextEditable() || isTextSelectable()) &&
... isFocused()) {
10698         final InputMethodManager imm =
... InputMethodManager.peekInstance();
10699         viewClicked(imm);
10700         if (!isTextSelectable() && mEditor.mShowSoftInputOnFocus &&
... imm != null) {
10701             handled |= imm.showSoftInput(this, 0);
10702         }
10703     }
10704
10705     return handled;
10706 }
10707
10708 private boolean hasSpannableText() {
10709     return mText != null && mText instanceof Spannable;
10710 }
```

```
10711
10712     /** @hide */
10713     @Override
10714     public void sendAccessibilityEventInternal(int eventType) {
10715         if (eventType ==
... AccessibilityEvent.TYPE_VIEW_ACCESSIBILITY_FOCUSED && mEditor != null) {
10716
... mEditor.mProcessTextIntentActionsHandler.initializeAccessibilityActions(
... );
10717     }
10718
10719     // Do not send scroll events since first they are not
... interesting for
10720     // accessibility and second such events a generated too
... frequently.
10721     // For details see the implementation of bringTextIntoView().
10722     if (eventType == AccessibilityEvent.TYPE_VIEW_SCROLLED) {
10723         return;
10724     }
10725     super.sendAccessibilityEventInternal(eventType);
10726 }
10727
10728 /**
10729  * Returns the text that should be exposed to accessibility
... services.
10730  * <p>
10731  * This approximates what is displayed visually. If the user has
... specified
10732  * that accessibility services should speak passwords, this method
... will
10733  * bypass any password transformation method and return unobscured
... text.
10734  *
10735  * @return the text that should be exposed to accessibility
... services, may
10736  *         be {@code null} if no text is set
10737  */
10738 @Nullable
10739 private CharSequence getTextForAccessibility() {
10740     // If the text is empty, we must be showing the hint text.
10741     if (TextUtils.isEmpty(mText)) {
10742         return mHint;
10743     }
10744
10745     // Otherwise, return whatever text is being displayed.
10746     return mTransformed;
10747 }
10748
10749 void sendAccessibilityEventTypeViewTextChanged(CharSequence
... beforeText,
```

```
10750         int fromIndex, int removedCount, int addedCount) {
10751             AccessibilityEvent event =
10752             ... AccessibilityEvent.obtain(AccessibilityEvent.TYPE_VIEW_TEXT_CHANGED);
10753                 event.setFromIndex(fromIndex);
10754                 event.setRemovedCount(removedCount);
10755                 event.setAddedCount(addedCount);
10756                 event.setBeforeText(beforeText);
10757                 sendAccessibilityEventUnchecked(event);
10758             }
10759
10760             /**
10761             * Returns whether this text view is a current input method target.
10762             The
10763             * default implementation just checks with {@link
10764             InputMethodManager}.
10765             * @return True if the TextView is a current input method target;
10766             false otherwise.
10767             */
10768             public boolean isInputMethodTarget() {
10769                 InputMethodManager imm = InputMethodManager.peekInstance();
10770                 return imm != null && imm.isActive(this);
10771             }
10772
10773             static final int ID_SELECT_ALL = android.R.id.selectAll;
10774             static final int ID_UNDO = android.R.id.undo;
10775             static final int ID_REDO = android.R.id.redo;
10776             static final int ID_CUT = android.R.id.cut;
10777             static final int ID_COPY = android.R.id.copy;
10778             static final int ID_PASTE = android.R.id.paste;
10779             static final int ID_SHARE = android.R.id.shareText;
10780             static final int ID_PASTE_AS_PLAIN_TEXT =
10781             ... android.R.id.pasteAsPlainText;
10782             static final int ID_REPLACE = android.R.id.replaceText;
10783             static final int ID_ASSIST = android.R.id.textAssist;
10784             static final int ID_AUTOFILL = android.R.id.autofill;
10785
10786             /**
10787             * Called when a context menu option for the text view is selected.
10788             Currently
10789             * this will be one of {@link android.R.id#selectAll}, {@link
10790             android.R.id#cut},
10791             * {@link android.R.id#copy}, {@link android.R.id#paste} or {@link
10792             android.R.id#shareText}.
10793             *
10794             * @return true if the context menu item action was performed.
10795             */
10796             public boolean onTextContextMenuItem(int id) {
10797                 int min = 0;
10798                 int max = mText.length();
```

```
10792
10793     if (isFocused()) {
10794         final int selStart = getSelectionStart();
10795         final int selEnd = getSelectionEnd();
10796
10797         min = Math.max(0, Math.min(selStart, selEnd));
10798         max = Math.max(0, Math.max(selStart, selEnd));
10799     }
10800
10801     switch (id) {
10802         case ID_SELECT_ALL:
10803             final boolean hadSelection = hasSelection();
10804             selectAllText();
10805             if (mEditor != null && hadSelection) {
10806                 mEditor.invalidateActionModeAsync();
10807             }
10808             return true;
10809
10810         case ID_UNDO:
10811             if (mEditor != null) {
10812                 mEditor.undo();
10813             }
10814             return true; // Returns true even if nothing was
... undone.
10815
10816         case ID_REDO:
10817             if (mEditor != null) {
10818                 mEditor.redo();
10819             }
10820             return true; // Returns true even if nothing was
... undone.
10821
10822         case ID_PASTE:
10823             paste(min, max, true /* withFormatting */);
10824             return true;
10825
10826         case ID_PASTE_AS_PLAIN_TEXT:
10827             paste(min, max, false /* withFormatting */);
10828             return true;
10829
10830         case ID_CUT:
10831             setPrimaryClip(ClipData.newPlainText(null,
... getTransformedText(min, max)));
10832             deleteText_internal(min, max);
10833             return true;
10834
10835         case ID_COPY:
10836             setPrimaryClip(ClipData.newPlainText(null,
... getTransformedText(min, max)));
10837             stopTextActionMode();
```

```
10838         return true;
10839
10840         case ID_REPLACE:
10841             if (mEditor != null) {
10842                 mEditor.replace();
10843             }
10844             return true;
10845
10846         case ID_SHARE:
10847             shareSelectedText();
10848             return true;
10849
10850         case ID_AUTOFILL:
10851             requestAutofill();
10852             stopTextActionMode();
10853             return true;
10854     }
10855     return false;
10856 }
10857
10858 CharSequence getTransformedText(int start, int end) {
10859     return removeSuggestionSpans(mTransformed.subSequence(start,
10860 ... end));
10861 }
10862
10863 @Override
10864 public boolean performLongClick() {
10865     boolean handled = false;
10866
10867     if (mEditor != null) {
10868         mEditor.mIsBeingLongClicked = true;
10869     }
10870
10871     if (super.performLongClick()) {
10872         handled = true;
10873     }
10874
10875     if (mEditor != null) {
10876         handled |= mEditor.performLongClick(handled);
10877         mEditor.mIsBeingLongClicked = false;
10878     }
10879
10880     if (handled) {
10881         performHapticFeedback(HapticFeedbackConstants.LONG_PRESS);
10882         if (mEditor != null) mEditor.mDiscardNextActionUp = true;
10883     } else {
10884         MetricsLogger.action(
10885             mContext,
10886             MetricsEvent.TEXT_LONGPRESS,
10887             TextViewMetrics.SUBTYPE_LONG_PRESS_OTHER);
10888     }
```

```
10887     }
10888
10889     return handled;
10890 }
10891
10892 @Override
10893 protected void onScrollChanged(int horiz, int vert, int oldHoriz,
... int oldVert) {
10894     super.onScrollChanged(horiz, vert, oldHoriz, oldVert);
10895     if (mEditor != null) {
10896         mEditor.onScrollChanged();
10897     }
10898 }
10899
10900 /**
10901  * Return whether or not suggestions are enabled on this TextView.
... The suggestions are generated
10902  * by the IME or by the spell checker as the user types. This is
... done by adding
10903  * {@link SuggestionSpan}s to the text.
10904  *
10905  * When suggestions are enabled (default), this list of suggestions
... will be displayed when the
10906  * user asks for them on these parts of the text. This value depends
... on the inputType of this
10907  * TextView.
10908  *
10909  * The class of the input type must be {@link
... InputType#TYPE_CLASS_TEXT}.
10910  *
10911  * In addition, the type variation must be one of
10912  * {@link InputType#TYPE_TEXT_VARIATION_NORMAL},
10913  * {@link InputType#TYPE_TEXT_VARIATION_EMAIL_SUBJECT},
10914  * {@link InputType#TYPE_TEXT_VARIATION_LONG_MESSAGE},
10915  * {@link InputType#TYPE_TEXT_VARIATION_SHORT_MESSAGE} or
10916  * {@link InputType#TYPE_TEXT_VARIATION_WEB_EDIT_TEXT}.
10917  *
10918  * And finally, the {@link InputType#TYPE_TEXT_FLAG_NO_SUGGESTIONS}
... flag must not be set.
10919  *
10920  * @return true if the suggestions popup window is enabled, based on
... the inputType.
10921  */
10922 public boolean isSuggestionsEnabled() {
10923     if (mEditor == null) return false;
10924     if ((mEditor.mInputType & InputType.TYPE_MASK_CLASS) !=
... InputType.TYPE_CLASS_TEXT) {
10925         return false;
10926     }
10927     if ((mEditor.mInputType &
```

```
10927... InputType.TYPE_TEXT_FLAG_NO_SUGGESTIONS) > 0) return false;
10928
10929         final int variation = mEditor.mInputType &
... EditorInfo.TYPE_MASK_VARIATION;
10930         return (variation == EditorInfo.TYPE_TEXT_VARIATION_NORMAL
10931             || variation ==
... EditorInfo.TYPE_TEXT_VARIATION_EMAIL_SUBJECT
10932             || variation ==
... EditorInfo.TYPE_TEXT_VARIATION_LONG_MESSAGE
10933             || variation ==
... EditorInfo.TYPE_TEXT_VARIATION_SHORT_MESSAGE
10934             || variation ==
... EditorInfo.TYPE_TEXT_VARIATION_WEB_EDIT_TEXT);
10935     }
10936
10937     /**
10938     * If provided, this ActionMode.Callback will be used to create the
... ActionMode when text
10939     * selection is initiated in this View.
10940     *
10941     * <p>The standard implementation populates the menu with a subset
... of Select All, Cut, Copy,
10942     * Paste, Replace and Share actions, depending on what this View
... supports.
10943     *
10944     * <p>A custom implementation can add new entries in the default
... menu in its
10945     * {@link
... android.view.ActionMode.Callback#onPrepareActionMode(ActionMode,
... android.view.Menu)}
10946     * method. The default actions can also be removed from the menu
... using
10947     * {@link android.view.Menu#removeItem(int)} and passing {@link
... android.R.id#selectAll},
10948     * {@link android.R.id#cut}, {@link android.R.id#copy}, {@link
... android.R.id#paste},
10949     * {@link android.R.id#replaceText} or {@link
... android.R.id#shareText} ids as parameters.
10950     *
10951     * <p>Returning false from
10952     * {@link
... android.view.ActionMode.Callback#createActionMode(ActionMode,
... android.view.Menu)}
10953     * will prevent the action mode from being started.
10954     *
10955     * <p>Action click events should be handled by the custom
... implementation of
10956     * {@link
... android.view.ActionMode.Callback#onActionItemClicked(ActionMode,
10957     * android.view.MenuItem)}.
```



```
10958 *
10959 * <p>Note that text selection mode is not started when a TextView
... receives focus and the
10960 * {@link android.R.attr#selectAllOnFocus} flag has been set. The
... content is highlighted in
10961 * that case, to allow for quick replacement.
10962 */
10963 public void setCustomSelectionModeCallback(ActionMode.Callback
... actionModeCallback) {
10964     createEditorIfNeeded();
10965     mEditor.mCustomSelectionModeCallback = actionModeCallback;
10966 }
10967
10968 /**
10969 * Retrieves the value set in {@link
... #setCustomSelectionModeCallback}. Default is null.
10970 *
10971 * @return The current custom selection callback.
10972 */
10973 public ActionMode.Callback getCustomSelectionModeCallback() {
10974     return mEditor == null ? null :
... mEditor.mCustomSelectionModeCallback;
10975 }
10976
10977 /**
10978 * If provided, this ActionMode.Callback will be used to create the
... ActionMode when text
10979 * insertion is initiated in this View.
10980 * The standard implementation populates the menu with a subset of
... Select All,
10981 * Paste and Replace actions, depending on what this View supports.
10982 *
10983 * <p>A custom implementation can add new entries in the default
... menu in its
10984 * {@link
... android.view.ActionMode.Callback#onPrepareActionMode(android.view.
... ActionMode,
10985 * android.view.Menu)} method. The default actions can also be
... removed from the menu using
10986 * {@link android.view.Menu#removeItem(int)} and passing {@link
... android.R.id#selectAll},
10987 * {@link android.R.id#paste} or {@link android.R.id#replaceText}
... ids as parameters.</p>
10988 *
10989 * <p>Returning false from
10990 * {@link
... android.view.ActionMode.Callback#createActionMode(android.view.
... ActionMode,
10991 * android.view.Menu)} will prevent the action mode from being
... started.</p>
```

```
10992 *
10993 * <p>Action click events should be handled by the custom
... implementation of
10994 * {@link
... android.view.ActionMode.Callback#onActionItemClicked(android.view.
... ActionMode,
10995 * android.view.MenuItem)}.</p>
10996 *
10997 * <p>Note that text insertion mode is not started when a TextView
... receives focus and the
10998 * {@link android.R.attr#selectAllOnFocus} flag has been set.</p>
10999 */
11000 public void setCustomInsertionActionModeCallback(ActionMode.Callback
... actionModeCallback) {
11001     createEditorIfNeeded();
11002     mEditor.mCustomInsertionActionModeCallback = actionModeCallback;
11003 }
11004
11005 /**
11006 * Retrieves the value set in {@link
... #setCustomInsertionActionModeCallback}. Default is null.
11007 *
11008 * @return The current custom insertion callback.
11009 */
11010 public ActionMode.Callback getCustomInsertionActionModeCallback() {
11011     return mEditor == null ? null :
... mEditor.mCustomInsertionActionModeCallback;
11012 }
11013
11014 /**
11015 * Sets the {@link TextClassifier} for this TextView.
11016 */
11017 public void setTextClassifier(@Nullable TextClassifier
... textClassifier) {
11018     mTextClassifier = textClassifier;
11019 }
11020
11021 /**
11022 * Returns the {@link TextClassifier} used by this TextView.
11023 * If no TextClassifier has been set, this TextView uses the default
... set by the
11024 * {@link TextClassificationManager}.
11025 */
11026 @NonNull
11027 public TextClassifier getTextClassifier() {
11028     if (mTextClassifier == null) {
11029         TextClassificationManager tcm =
11030 ... mContext.getSystemService(TextClassificationManager.class);
11031         if (tcm != null) {
```

```
11032         mTextClassifier = tcm.getTextClassifier();
11033     } else {
11034         mTextClassifier = TextClassifier.NO_OP;
11035     }
11036 }
11037 return mTextClassifier;
11038 }
11039
11040 /**
11041  * @hide
11042  */
11043 protected void stopTextActionMode() {
11044     if (mEditor != null) {
11045         mEditor.stopTextActionMode();
11046     }
11047 }
11048
11049 boolean canUndo() {
11050     return mEditor != null && mEditor.canUndo();
11051 }
11052
11053 boolean canRedo() {
11054     return mEditor != null && mEditor.canRedo();
11055 }
11056
11057 boolean canCut() {
11058     if (hasPasswordTransformationMethod()) {
11059         return false;
11060     }
11061
11062     if (mText.length() > 0 && hasSelection() && mText instanceof
... Editable && mEditor != null
11063         && mEditor.mKeyListener != null) {
11064         return true;
11065     }
11066
11067     return false;
11068 }
11069
11070 boolean canCopy() {
11071     if (hasPasswordTransformationMethod()) {
11072         return false;
11073     }
11074
11075     if (mText.length() > 0 && hasSelection() && mEditor != null) {
11076         return true;
11077     }
11078
11079     return false;
11080 }
```

```
11081
11082     boolean canShare() {
11083         if (!getContext().canStartActivityForResult() ||
... !isDeviceProvisioned()) {
11084             return false;
11085         }
11086         return canCopy();
11087     }
11088
11089     boolean isDeviceProvisioned() {
11090         if (mDeviceProvisionedState == DEVICE_PROVISIONED_UNKNOWN) {
11091             mDeviceProvisionedState = Settings.Global.getInt(
11092                 mContext.getContentResolver(),
... Settings.Global.DEVICE_PROVISIONED, 0) != 0
11093                 ? DEVICE_PROVISIONED_YES
11094                 : DEVICE_PROVISIONED_NO;
11095         }
11096         return mDeviceProvisionedState == DEVICE_PROVISIONED_YES;
11097     }
11098
11099     boolean canPaste() {
11100         return (mText instanceof Editable
11101             && mEditor != null && mEditor.mKeyListener != null
11102             && getSelectionStart() >= 0
11103             && getSelectionEnd() >= 0
11104             && ((ClipboardManager)
... getContext().getSystemService(Context.CLIPBOARD_SERVICE))
11105                 .hasPrimaryClip());
11106     }
11107
11108     boolean canPasteAsPlainText() {
11109         if (!canPaste()) {
11110             return false;
11111         }
11112
11113         final ClipData clipData =
11114             ((ClipboardManager)
... getContext().getSystemService(Context.CLIPBOARD_SERVICE))
11115                 .getPrimaryClip();
11116         final ClipDescription description = clipData.getDescription();
11117         final boolean isPlainType =
... description.hasMimeType(ClipDescription.MIMETYPE_TEXT_PLAIN);
11118         final CharSequence text = clipData.getItemAt(0).getText();
11119         if (isPlainType && (text instanceof Spanned)) {
11120             Spanned spanned = (Spanned) text;
11121             if (TextUtils.hasStyleSpan(spanned)) {
11122                 return true;
11123             }
11124         }
11125         return
```

```
11125... description.hasMimeType(ClipDescription.MIMETYPE_TEXT_HTML);
11126     }
11127
11128     boolean canProcessText() {
11129         if (getId() == View.NO_ID) {
11130             return false;
11131         }
11132         return canShare();
11133     }
11134
11135     boolean canSelectAllText() {
11136         return canSelectText() && !hasPasswordTransformationMethod()
11137             && !(getSelectionStart() == 0 && getSelectionEnd() ==
11138 ... mText.length());
11139     }
11140
11141     boolean selectAllText() {
11142         final int length = mText.length();
11143         Selection.setSelection((Spannable) mText, 0, length);
11144         return length > 0;
11145     }
11146
11147     void replaceSelectionWithText(CharSequence text) {
11148         ((Editable) mText).replace(getSelectionStart(),
11149 ... getSelectionEnd(), text);
11150     }
11151
11152     /**
11153     * Paste clipboard content between min and max positions.
11154     */
11155     private void paste(int min, int max, boolean withFormatting) {
11156         ClipboardManager clipboard =
11157             (ClipboardManager)
11158 ... getContext().getSystemService(Context.CLIPBOARD_SERVICE);
11159         ClipData clip = clipboard.getPrimaryClip();
11160         if (clip != null) {
11161             boolean didFirst = false;
11162             for (int i = 0; i < clip.getItemCount(); i++) {
11163                 final CharSequence paste;
11164                 if (withFormatting) {
11165                     paste =
11166 ... clip.getItemAt(i).coerceToStyledText(getContext());
11167                 } else {
11168                     // Get an item as text and remove all spans by
11169 ... toString().
11170                 }
11171                 final CharSequence text =
11172 ... clip.getItemAt(i).coerceToText(getContext());
11173                 paste = (text instanceof Spanned) ? text.toString()
11174 ... : text;
11175             }
11176         }
11177     }
11178 }
```

```
11168         if (paste != null) {
11169             if (!didFirst) {
11170                 Selection.setSelection((Spannable) mText, max);
11171                 ((Editable) mText).replace(min, max, paste);
11172                 didFirst = true;
11173             } else {
11174                 ((Editable) mText).insert(getSelectionEnd(),
... "\n");
11175                 ((Editable) mText).insert(getSelectionEnd(),
... paste);
11176             }
11177         }
11178     }
11179     sLastCutCopyOrTextChangedTime = 0;
11180 }
11181 }
11182
11183 private void shareSelectedText() {
11184     String selectedText = getSelectedText();
11185     if (selectedText != null && !selectedText.isEmpty()) {
11186         Intent sharingIntent = new
... Intent(android.content.Intent.ACTION_SEND);
11187         sharingIntent.setType("text/plain");
11188
... sharingIntent.removeExtra(android.content.Intent.EXTRA_TEXT);
11189         sharingIntent.putExtra(android.content.Intent.EXTRA_TEXT,
... selectedText);
11190
... getContext().startActivity(Intent.createChooser(sharingIntent, null));
11191         Selection.setSelection((Spannable) mText,
... getSelectionEnd());
11192     }
11193 }
11194
11195 private void setPrimaryClip(ClipData clip) {
11196     ClipboardManager clipboard =
11197         (ClipboardManager)
... getContext().getSystemService(Context.CLIPBOARD_SERVICE);
11198     clipboard.setPrimaryClip(clip);
11199     sLastCutCopyOrTextChangedTime = SystemClock.uptimeMillis();
11200 }
11201
11202 /**
11203     * Get the character offset closest to the specified absolute
... position. A typical use case is to
11204     * pass the result of {@link MotionEvent#getX()} and {@link
... MotionEvent#getY()} to this method.
11205     *
11206     * @param x The horizontal absolute position of a point on screen
11207     * @param y The vertical absolute position of a point on screen
```

```
11208 * @return the character offset for the character whose position is
... closest to the specified
11209 * position. Returns -1 if there is no layout.
11210 */
11211 public int getOffsetForPosition(float x, float y) {
11212     if (getLayout() == null) return -1;
11213     final int line = getLineAtCoordinate(y);
11214     final int offset = getOffsetAtCoordinate(line, x);
11215     return offset;
11216 }
11217
11218 float convertToLocalHorizontalCoordinate(float x) {
11219     x -= getTotalPaddingLeft();
11220     // Clamp the position to inside of the view.
11221     x = Math.max(0.0f, x);
11222     x = Math.min(getWidth() - getTotalPaddingRight() - 1, x);
11223     x += getScrollX();
11224     return x;
11225 }
11226
11227 int getLineAtCoordinate(float y) {
11228     y -= getTotalPaddingTop();
11229     // Clamp the position to inside of the view.
11230     y = Math.max(0.0f, y);
11231     y = Math.min(getHeight() - getTotalPaddingBottom() - 1, y);
11232     y += getScrollY();
11233     return getLayout().getLineForVertical((int) y);
11234 }
11235
11236 int getLineAtCoordinateUnclamped(float y) {
11237     y -= getTotalPaddingTop();
11238     y += getScrollY();
11239     return getLayout().getLineForVertical((int) y);
11240 }
11241
11242 int getOffsetAtCoordinate(int line, float x) {
11243     x = convertToLocalHorizontalCoordinate(x);
11244     return getLayout().getOffsetForHorizontal(line, x);
11245 }
11246
11247 @Override
11248 public boolean onDragEvent(DragEvent event) {
11249     switch (event.getAction()) {
11250         case DragEvent.ACTION_DRAG_STARTED:
11251             return mEditor != null &&
... mEditor.hasInsertionController();
11252
11253         case DragEvent.ACTION_DRAG_ENTERED:
11254             TextView.this.requestFocus();
11255             return true;
```

```
11256
11257     case DragEvent.ACTION_DRAG_LOCATION:
11258         if (mText instanceof Spannable) {
11259             final int offset =
... getOffsetForPosition(event.getX(), event.getY());
11260                 Selection.setSelection((Spannable) mText, offset);
11261         }
11262         return true;
11263
11264     case DragEvent.ACTION_DROP:
11265         if (mEditor != null) mEditor.onDrop(event);
11266         return true;
11267
11268     case DragEvent.ACTION_DRAG_ENDED:
11269     case DragEvent.ACTION_DRAG_EXITED:
11270     default:
11271         return true;
11272     }
11273 }
11274
11275 boolean isInBatchEditMode() {
11276     if (mEditor == null) return false;
11277     final Editor.InputMethodState ims = mEditor.mInputMethodState;
11278     if (ims != null) {
11279         return ims.mBatchEditNesting > 0;
11280     }
11281     return mEditor.mInBatchEditControllers;
11282 }
11283
11284 @Override
11285 public void onRtlPropertiesChanged(int layoutDirection) {
11286     super.onRtlPropertiesChanged(layoutDirection);
11287
11288     final TextDirectionHeuristic newTextDir =
... getTextDirectionHeuristic();
11289     if (mTextDir != newTextDir) {
11290         mTextDir = newTextDir;
11291         if (mLayout != null) {
11292             checkForRelayout();
11293         }
11294     }
11295 }
11296
11297 /**
11298  * @hide
11299  */
11300 protected TextDirectionHeuristic getTextDirectionHeuristic() {
11301     if (hasPasswordTransformationMethod()) {
11302         // passwords fields should be LTR
11303         return TextDirectionHeuristics.LTR;
```



```
11304 }
11305
11306     if (mEditor != null
11307         && (mEditor.mInputType & EditorInfo.TYPE_MASK_CLASS)
11308         == EditorInfo.TYPE_CLASS_PHONE) {
11309         // Phone numbers must be in the direction of the locale's
... digits. Most locales have LTR
11310         // digits, but some locales, such as those written in the
... Adlam or N'Ko scripts, have
11311         // RTL digits.
11312         final DecimalFormatSymbols symbols =
... DecimalFormatSymbols.getInstance(getTextLocale());
11313         final String zero = symbols.getDigitStrings()[0];
11314         // In case the zero digit is multi-codepoint, just use the
... first codepoint to determine
11315         // direction.
11316         final int firstCodepoint = zero.codePointAt(0);
11317         final byte digitDirection =
... Character.getDirectionality(firstCodepoint);
11318         if (digitDirection == Character.DIRECTIONALITY_RIGHT_TO_LEFT
11319             || digitDirection ==
... Character.DIRECTIONALITY_RIGHT_TO_LEFT_ARABIC) {
11320             return TextDirectionHeuristics.RTL;
11321         } else {
11322             return TextDirectionHeuristics.LTR;
11323         }
11324     }
11325
11326     // Always need to resolve layout direction first
11327     final boolean defaultIsRtl = (getLayoutDirection() ==
... LAYOUT_DIRECTION_RTL);
11328
11329     // Now, we can select the heuristic
11330     switch (getTextDirection()) {
11331     default:
11332     case TEXT_DIRECTION_FIRST_STRONG:
11333     return (defaultIsRtl ?
... TextDirectionHeuristics.FIRSTSTRONG_RTL :
11334         TextDirectionHeuristics.FIRSTSTRONG_LTR);
11335     case TEXT_DIRECTION_ANY_RTL:
11336     return TextDirectionHeuristics.ANYRTL_LTR;
11337     case TEXT_DIRECTION_LTR:
11338     return TextDirectionHeuristics.LTR;
11339     case TEXT_DIRECTION_RTL:
11340     return TextDirectionHeuristics.RTL;
11341     case TEXT_DIRECTION_LOCALE:
11342     return TextDirectionHeuristics.LOCALE;
11343     case TEXT_DIRECTION_FIRST_STRONG_LTR:
11344     return TextDirectionHeuristics.FIRSTSTRONG_LTR;
11345     case TEXT_DIRECTION_FIRST_STRONG_RTL:
```

```
11346         return TextDirectionHeuristics.FIRSTSTRONG_RTL;
11347     }
11348 }
11349
11350 /**
11351  * @hide
11352  */
11353 @Override
11354 public void onResolveDrawables(int layoutDirection) {
11355     // No need to resolve twice
11356     if (mLastLayoutDirection == layoutDirection) {
11357         return;
11358     }
11359     mLastLayoutDirection = layoutDirection;
11360
11361     // Resolve drawables
11362     if (mDrawables != null) {
11363         if (mDrawables.resolveWithLayoutDirection(layoutDirection))
11364     {
11365         prepareDrawableForDisplay(mDrawables.mShowing[Drawables.LEFT]);
11366         prepareDrawableForDisplay(mDrawables.mShowing[Drawables.RIGHT]);
11367         applyCompoundDrawableTint();
11368     }
11369 }
11370
11371 /**
11372  * Prepares a drawable for display by propagating layout direction
11373  * and
11374  * drawable state.
11375  * @param dr the drawable to prepare
11376  */
11377 private void prepareDrawableForDisplay(@Nullable Drawable dr) {
11378     if (dr == null) {
11379         return;
11380     }
11381
11382     dr.setLayoutDirection(getLayoutDirection());
11383
11384     if (dr.isStateful()) {
11385         dr.setState(getDrawableState());
11386         dr.jumpToCurrentState();
11387     }
11388 }
11389
11390 /**
11391  * @hide
```

```
11392 */
11393     protected void resetResolvedDrawables() {
11394         super.resetResolvedDrawables();
11395         mLastLayoutDirection = -1;
11396     }
11397
11398     /**
11399     * @hide
11400     */
11401     protected void viewClicked(InputMethodManager imm) {
11402         if (imm != null) {
11403             imm.viewClicked(this);
11404         }
11405     }
11406
11407     /**
11408     * Deletes the range of text [start, end[.
11409     * @hide
11410     */
11411     protected void deleteText_internal(int start, int end) {
11412         ((Editable) mText).delete(start, end);
11413     }
11414
11415     /**
11416     * Replaces the range of text [start, end[ by replacement text
11417     * @hide
11418     */
11419     protected void replaceText_internal(int start, int end, CharSequence
11420     ... text) {
11421         ((Editable) mText).replace(start, end, text);
11422     }
11423
11424     /**
11425     * Sets a span on the specified range of text
11426     * @hide
11427     */
11428     protected void setSpan_internal(Object span, int start, int end, int
11429     ... flags) {
11430         ((Editable) mText).setSpan(span, start, end, flags);
11431     }
11432
11433     /**
11434     * Moves the cursor to the specified offset position in text
11435     * @hide
11436     */
11437     protected void setCursorPosition_internal(int start, int end) {
11438         Selection.setSelection(((Editable) mText), start, end);
11439     }
11440
11441     /**
```

```
11440 * An Editor should be created as soon as any of the
... editable-specific fields (grouped
11441 * inside the Editor object) is assigned to a non-default value.
11442 * This method will create the Editor if needed.
11443 *
11444 * A standard TextView (as well as buttons, checkboxes...) should
... not qualify and hence will
11445 * have a null Editor, unlike an EditText. Inconsistent in-between
... states will have an
11446 * Editor for backward compatibility, as soon as one of these fields
... is assigned.
11447 *
11448 * Also note that for performance reasons, the mEditor is created
... when needed, but not
11449 * reset when no more edit-specific fields are needed.
11450 */
11451 private void createEditorIfNeeded() {
11452     if (mEditor == null) {
11453         mEditor = new Editor(this);
11454     }
11455 }
11456
11457 /**
11458  * @hide
11459  */
11460 @Override
11461 public CharSequence getIterableTextForAccessibility() {
11462     return mText;
11463 }
11464
11465 private void ensureIterableTextForAccessibilitySelectable() {
11466     if (!(mText instanceof Spannable)) {
11467         setText(mText, BufferType.SPANNABLE);
11468     }
11469 }
11470
11471 /**
11472  * @hide
11473  */
11474 @Override
11475 public TextSegmentIterator getIteratorForGranularity(int
... granularity) {
11476     switch (granularity) {
11477         case AccessibilityNodeInfo.MOVEMENT_GRANULARITY_LINE: {
11478             Spannable text = (Spannable)
... getIterableTextForAccessibility();
11479             if (!TextUtils.isEmpty(text) && getLayout() != null) {
11480                 AccessibilityIterators.LineTextSegmentIterator
... iterator =
11481
```

```
11481... AccessibilityIterators.LineTextSegmentIterator.getInstance();
11482         iterator.initialize(text, getLayout());
11483         return iterator;
11484     }
11485     } break;
11486     case AccessibilityNodeInfo.MOVEMENT_GRANULARITY_PAGE: {
11487         Spannable text = (Spannable)
... getIterableTextForAccessibility();
11488         if (!TextUtils.isEmpty(text) && getLayout() != null) {
11489             AccessibilityIterators.PageTextSegmentIterator
... iterator =
11490         AccessibilityIterators.PageTextSegmentIterator.getInstance();
11491             iterator.initialize(this);
11492             return iterator;
11493         }
11494     } break;
11495 }
11496 return super.getIteratorForGranularity(granularity);
11497 }
11498
11499 /**
11500  * @hide
11501  */
11502 @Override
11503 public int getAccessibilitySelectionStart() {
11504     return getSelectionStart();
11505 }
11506
11507 /**
11508  * @hide
11509  */
11510 public boolean isAccessibilitySelectionExtendable() {
11511     return true;
11512 }
11513
11514 /**
11515  * @hide
11516  */
11517 @Override
11518 public int getAccessibilitySelectionEnd() {
11519     return getSelectionEnd();
11520 }
11521
11522 /**
11523  * @hide
11524  */
11525 @Override
11526 public void setAccessibilitySelection(int start, int end) {
11527     if (getAccessibilitySelectionStart() == start
```

```
11528         && getAccessibilitySelectionEnd() == end) {
11529             return;
11530         }
11531         CharSequence text = getIterableTextForAccessibility();
11532         if (Math.min(start, end) >= 0 && Math.max(start, end) <=
... text.length()) {
11533             Selection.setSelection((Spannable) text, start, end);
11534         } else {
11535             Selection.removeSelection((Spannable) text);
11536         }
11537         // Hide all selection controllers used for adjusting selection
11538         // since we are doing so explicitly by other means and these
11539         // controllers interact with how selection behaves.
11540         if (mEditor != null) {
11541             mEditor.hideCursorAndSpanControllers();
11542             mEditor.stopTextActionMode();
11543         }
11544     }
11545
11546     /** @hide */
11547     @Override
11548     protected void encodeProperties(@NonNull ViewHierarchyEncoder
... stream) {
11549         super.encodeProperties(stream);
11550
11551         TruncateAt ellipsize = getEllipsize();
11552         stream.addProperty("text:ellipsize", ellipsize == null ? null :
... ellipsize.name());
11553         stream.addProperty("text:textSize", getTextSize());
11554         stream.addProperty("text:scaledTextSize", getScaledTextSize());
11555         stream.addProperty("text:typefaceStyle", getTypefaceStyle());
11556         stream.addProperty("text:selectionStart", getSelectionStart());
11557         stream.addProperty("text:selectionEnd", getSelectionEnd());
11558         stream.addProperty("text:curTextColor", mCurTextColor);
11559         stream.addProperty("text:text", mText == null ? null :
... mText.toString());
11560         stream.addProperty("text:gravity", mGravity);
11561     }
11562
11563     /**
11564     * User interface state that is stored by TextView for implementing
11565     * {@link View#onSaveInstanceState}.
11566     */
11567     public static class SavedState extends BaseSavedState {
11568         int selStart = -1;
11569         int selEnd = -1;
11570         CharSequence text;
11571         boolean frozenWithFocus;
11572         CharSequence error;
11573         ParcelableParcel editorState; // Optional state from Editor.
```

```
11574
11575     SavedState(Parcelable superState) {
11576         super(superState);
11577     }
11578
11579     @Override
11580     public void writeToParcel(Parcel out, int flags) {
11581         super.writeToParcel(out, flags);
11582         out.writeInt(selStart);
11583         out.writeInt(selEnd);
11584         out.writeInt(frozenWithFocus ? 1 : 0);
11585         TextUtils.writeToParcel(text, out, flags);
11586
11587         if (error == null) {
11588             out.writeInt(0);
11589         } else {
11590             out.writeInt(1);
11591             TextUtils.writeToParcel(error, out, flags);
11592         }
11593
11594         if (editorState == null) {
11595             out.writeInt(0);
11596         } else {
11597             out.writeInt(1);
11598             editorState.writeToParcel(out, flags);
11599         }
11600     }
11601
11602     @Override
11603     public String toString() {
11604         String str = "TextView.SavedState{"
11605             + Integer.toHexString(System.identityHashCode(this))
11606             + " start=" + selStart + " end=" + selEnd;
11607         if (text != null) {
11608             str += " text=" + text;
11609         }
11610         return str + "}";
11611     }
11612
11613     @SuppressWarnings("hiding")
11614     public static final Parcelable.Creator<SavedState> CREATOR =
11615         new Parcelable.Creator<SavedState>() {
11616             public SavedState createFromParcel(Parcel in) {
11617                 return new SavedState(in);
11618             }
11619
11620             public SavedState[] newArray(int size) {
11621                 return new SavedState[size];
11622             }
11623         };

```

```
11624
11625     private SavedState(Parcel in) {
11626         super(in);
11627         selStart = in.readInt();
11628         selEnd = in.readInt();
11629         frozenWithFocus = (in.readInt() != 0);
11630         text = TextUtils.CHAR_SEQUENCE_CREATOR.createFromParcel(in);
11631
11632         if (in.readInt() != 0) {
11633             error =
... TextUtils.CHAR_SEQUENCE_CREATOR.createFromParcel(in);
11634         }
11635
11636         if (in.readInt() != 0) {
11637             editorState =
... ParcelableParcel.CREATOR.createFromParcel(in);
11638         }
11639     }
11640 }
11641
11642     private static class CharWrapper implements CharSequence, GetChars,
... GraphicsOperations {
11643         private char[] mChars;
11644         private int mStart, mLength;
11645
11646         public CharWrapper(char[] chars, int start, int len) {
11647             mChars = chars;
11648             mStart = start;
11649             mLength = len;
11650         }
11651
11652         /* package */ void set(char[] chars, int start, int len) {
11653             mChars = chars;
11654             mStart = start;
11655             mLength = len;
11656         }
11657
11658         public int length() {
11659             return mLength;
11660         }
11661
11662         public char charAt(int off) {
11663             return mChars[off + mStart];
11664         }
11665
11666         @Override
11667         public String toString() {
11668             return new String(mChars, mStart, mLength);
11669         }
11670
```



```
11671 public CharSequence subSequence(int start, int end) {
11672     if (start < 0 || end < 0 || start > mLength || end >
... mLength) {
11673         throw new IndexOutOfBoundsException(start + ", " + end);
11674     }
11675
11676     return new String(mChars, start + mStart, end - start);
11677 }
11678
11679 public void getChars(int start, int end, char[] buf, int off) {
11680     if (start < 0 || end < 0 || start > mLength || end >
... mLength) {
11681         throw new IndexOutOfBoundsException(start + ", " + end);
11682     }
11683
11684     System.arraycopy(mChars, start + mStart, buf, off, end -
... start);
11685 }
11686
11687 @Override
11688 public void drawText(BaseCanvas c, int start, int end,
11689                     float x, float y, Paint p) {
11690     c.drawText(mChars, start + mStart, end - start, x, y, p);
11691 }
11692
11693 @Override
11694 public void drawTextRun(BaseCanvas c, int start, int end,
11695                        int contextStart, int contextEnd, float x, float y,
... boolean isRtl, Paint p) {
11696     int count = end - start;
11697     int contextCount = contextEnd - contextStart;
11698     c.drawTextRun(mChars, start + mStart, count, contextStart +
... mStart,
11699                  contextCount, x, y, isRtl, p);
11700 }
11701
11702 public float measureText(int start, int end, Paint p) {
11703     return p.measureText(mChars, start + mStart, end - start);
11704 }
11705
11706 public int getTextWidths(int start, int end, float[] widths,
... Paint p) {
11707     return p.getTextWidths(mChars, start + mStart, end - start,
... widths);
11708 }
11709
11710 public float getTextRunAdvances(int start, int end, int
... contextStart,
11711                                int contextEnd, boolean isRtl, float[] advances, int
... advancesIndex,
```

```
11712         Paint p) {
11713             int count = end - start;
11714             int contextCount = contextEnd - contextStart;
11715             return p.getTextRunAdvances(mChars, start + mStart, count,
11716                 contextStart + mStart, contextCount, isRtl,
11717         ... advances,
11718                 advancesIndex);
11719         }
11720     public int getTextRunCursor(int contextStart, int contextEnd,
11721     ... int dir,
11722         int offset, int cursorOpt, Paint p) {
11723         int contextCount = contextEnd - contextStart;
11724         return p.getTextRunCursor(mChars, contextStart + mStart,
11725             contextCount, dir, offset + mStart, cursorOpt);
11726     }
11727
11728     private static final class Marquee {
11729         // TODO: Add an option to configure this
11730         private static final float MARQUEE_DELTA_MAX = 0.07f;
11731         private static final int MARQUEE_DELAY = 1200;
11732         private static final int MARQUEE_DP_PER_SECOND = 30;
11733
11734         private static final byte MARQUEE_STOPPED = 0x0;
11735         private static final byte MARQUEE_STARTING = 0x1;
11736         private static final byte MARQUEE_RUNNING = 0x2;
11737
11738         private final WeakReference<TextView> mView;
11739         private final Choreographer mChoreographer;
11740
11741         private byte mStatus = MARQUEE_STOPPED;
11742         private final float mPixelsPerSecond;
11743         private float mMaxScroll;
11744         private float mMaxFadeScroll;
11745         private float mGhostStart;
11746         private float mGhostOffset;
11747         private float mFadeStop;
11748         private int mRepeatLimit;
11749
11750         private float mScroll;
11751         private long mLastAnimationMs;
11752
11753         Marquee(TextView v) {
11754             final float density =
11755     ... v.getContext().getResources().getDisplayMetrics().density;
11756             mPixelsPerSecond = MARQUEE_DP_PER_SECOND * density;
11757             mView = new WeakReference<TextView>(v);
11758             mChoreographer = Choreographer.getInstance();
11759         }
11760     }
```

```
11759
11760     private Choreographer.FrameCallback mTickCallback = new
... Choreographer.FrameCallback() {
11761         @Override
11762         public void doFrame(long frameTimeNanos) {
11763             tick();
11764         }
11765     };
11766
11767     private Choreographer.FrameCallback mStartCallback = new
... Choreographer.FrameCallback() {
11768         @Override
11769         public void doFrame(long frameTimeNanos) {
11770             mStatus = MARQUEE_RUNNING;
11771             mLastAnimationMs = mChoreographer.getFrameTime();
11772             tick();
11773         }
11774     };
11775
11776     private Choreographer.FrameCallback mRestartCallback = new
... Choreographer.FrameCallback() {
11777         @Override
11778         public void doFrame(long frameTimeNanos) {
11779             if (mStatus == MARQUEE_RUNNING) {
11780                 if (mRepeatLimit >= 0) {
11781                     mRepeatLimit--;
11782                 }
11783                 start(mRepeatLimit);
11784             }
11785         }
11786     };
11787
11788     void tick() {
11789         if (mStatus != MARQUEE_RUNNING) {
11790             return;
11791         }
11792
11793         mChoreographer.removeFrameCallback(mTickCallback);
11794
11795         final TextView textView = mView.get();
11796         if (textView != null && (textView.isFocused() ||
... textView.isSelected())) {
11797             long currentMs = mChoreographer.getFrameTime();
11798             long deltaMs = currentMs - mLastAnimationMs;
11799             mLastAnimationMs = currentMs;
11800             float deltaPx = deltaMs / 1000f * mPixelsPerSecond;
11801             mScroll += deltaPx;
11802             if (mScroll > mMaxScroll) {
11803                 mScroll = mMaxScroll;
11804
```

```
11804... mChoreographer.postFrameCallbackDelayed(mRestartCallback,
... MARQUEE_DELAY);
11805         } else {
11806             mChoreographer.postFrameCallback(mTickCallback);
11807         }
11808         textView.invalidate();
11809     }
11810 }
11811
11812 void stop() {
11813     mStatus = MARQUEE_STOPPED;
11814     mChoreographer.removeFrameCallback(mStartCallback);
11815     mChoreographer.removeFrameCallback(mRestartCallback);
11816     mChoreographer.removeFrameCallback(mTickCallback);
11817     resetScroll();
11818 }
11819
11820 private void resetScroll() {
11821     mScroll = 0.0f;
11822     final TextView textView = mView.get();
11823     if (textView != null) textView.invalidate();
11824 }
11825
11826 void start(int repeatLimit) {
11827     if (repeatLimit == 0) {
11828         stop();
11829         return;
11830     }
11831     mRepeatLimit = repeatLimit;
11832     final TextView textView = mView.get();
11833     if (textView != null && textView.mLayout != null) {
11834         mStatus = MARQUEE_STARTING;
11835         mScroll = 0.0f;
11836         final int textWidth = textView.getWidth() -
... textView.getCompoundPaddingLeft()
11837             - textView.getCompoundPaddingRight();
11838         final float lineWidth =
... textView.mLayout.getLineWidth(0);
11839         final float gap = textWidth / 3.0f;
11840         mGhostStart = lineWidth - textWidth + gap;
11841         mMaxScroll = mGhostStart + textWidth;
11842         mGhostOffset = lineWidth + gap;
11843         mFadeStop = lineWidth + textWidth / 6.0f;
11844         mMaxFadeScroll = mGhostStart + lineWidth + lineWidth;
11845
11846         textView.invalidate();
11847         mChoreographer.postFrameCallback(mStartCallback);
11848     }
11849 }
11850
```

```
11851 float getGhostOffset() {
11852     return mGhostOffset;
11853 }
11854
11855 float getScroll() {
11856     return mScroll;
11857 }
11858
11859 float getMaxFadeScroll() {
11860     return mMaxFadeScroll;
11861 }
11862
11863 boolean shouldDrawLeftFade() {
11864     return mScroll <= mFadeStop;
11865 }
11866
11867 boolean shouldDrawGhost() {
11868     return mStatus == MARQUEE_RUNNING && mScroll > mGhostStart;
11869 }
11870
11871 boolean isRunning() {
11872     return mStatus == MARQUEE_RUNNING;
11873 }
11874
11875 boolean isStopped() {
11876     return mStatus == MARQUEE_STOPPED;
11877 }
11878 }
11879
11880 private class ChangeWatcher implements TextWatcher, SpanWatcher {
11881
11882     private CharSequence mBeforeText;
11883
11884     public void beforeTextChanged(CharSequence buffer, int start,
11885                                     int before, int after) {
11886         if (DEBUG_EXTRACT) {
11887             Log.v(LOG_TAG, "beforeTextChanged start=" + start
11888                 + " before=" + before + " after=" + after + ": "
11889 + buffer);
11889         }
11890
11891         if (AccessibilityManager.getInstance(mContext).isEnabled()
11892             && !isPasswordInputType(getInputType()) &&
11893             !hasPasswordTransformationMethod()) {
11894             mBeforeText = buffer.toString();
11895         }
11896         TextView.this.sendBeforeTextChanged(buffer, start, before,
11897         after);
11897     }
11898 }
```

```
11898
11899     public void onTextChanged(CharSequence buffer, int start, int
... before, int after) {
11900         if (DEBUG_EXTRACT) {
11901             Log.v(LOG_TAG, "onTextChanged start=" + start
11902                 + " before=" + before + " after=" + after + ": "
... + buffer);
11903         }
11904         TextView.this.handleTextChanged(buffer, start, before,
... after);
11905
11906         if (AccessibilityManager.getInstance(mContext).isEnabled()
11907             && (isFocused() || isSelected() && isShown())) {
11908             sendAccessibilityEventTypeViewTextChanged(mBeforeText,
... start, before, after);
11909             mBeforeText = null;
11910         }
11911     }
11912
11913     public void afterTextChanged(Editable buffer) {
11914         if (DEBUG_EXTRACT) {
11915             Log.v(LOG_TAG, "afterTextChanged: " + buffer);
11916         }
11917         TextView.this.sendAfterTextChanged(buffer);
11918
11919         if (MetaKeyListener.getMetaState(buffer,
... MetaKeyListener.META_SELECTING) != 0) {
11920             MetaKeyListener.stopSelecting(TextView.this, buffer);
11921         }
11922     }
11923
11924     public void onSpanChanged(Spannable buf, Object what, int s, int
... e, int st, int en) {
11925         if (DEBUG_EXTRACT) {
11926             Log.v(LOG_TAG, "onSpanChanged s=" + s + " e=" + e
11927                 + " st=" + st + " en=" + en + " what=" + what +
... ": " + buf);
11928         }
11929         TextView.this.spanChange(buf, what, s, st, e, en);
11930     }
11931
11932     public void onSpanAdded(Spannable buf, Object what, int s, int
... e) {
11933         if (DEBUG_EXTRACT) {
11934             Log.v(LOG_TAG, "onSpanAdded s=" + s + " e=" + e + "
... what=" + what + ": " + buf);
11935         }
11936         TextView.this.spanChange(buf, what, -1, s, -1, e);
11937     }
11938
```

```
11939 public void onSpanRemoved(Spannable buf, Object what, int s, int
... e) {
11940     if (DEBUG_EXTRACT) {
11941         Log.v(LOG_TAG, "onSpanRemoved s=" + s + " e=" + e + "
... what=" + what + ": " + buf);
11942     }
11943     TextView.this.spanChange(buf, what, s, -1, e, -1);
11944 }
11945 }
11946 }
11947
```

EXHIBIT 7


```
1 /*
2  * Copyright (C) 2007 The Android Open Source Project
3  *
4  * Licensed under the Apache License, Version 2.0 (the "License");
5  * you may not use this file except in compliance with the License.
6  * You may obtain a copy of the License at
7  *
8  *     http://www.apache.org/licenses/LICENSE-2.0
9  *
10 * Unless required by applicable law or agreed to in writing, software
11 * distributed under the License is distributed on an "AS IS" BASIS,
12 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
13 * See the License for the specific language governing permissions and
14 * limitations under the License.
15 */
16
17 package android.text.util;
18
19 import android.annotation.IntDef;
20 import android.annotation.NonNull;
21 import android.annotation.Nullable;
22 import android.telephony.PhoneNumberUtils;
23 import android.text.Spannable;
24 import android.text.SpannableString;
25 import android.text.Spanned;
26 import android.text.method.LinkMovementMethod;
27 import android.text.method.MovementMethod;
28 import android.text.style.URLSpan;
29 import android.util.Patterns;
30 import android.webkit.WebView;
31 import android.widget.TextView;
32
33 import com.android.i18n.phonenumbers.PhoneNumberMatch;
34 import com.android.i18n.phonenumbers.PhoneNumberUtil;
35 import com.android.i18n.phonenumbers.PhoneNumberUtil.Leniency;
36
37 import libcore.util.EmptyArray;
38
39 import java.io.UnsupportedEncodingException;
40 import java.lang.annotation.Retention;
41 import java.lang.annotation.RetentionPolicy;
42 import java.net.URLEncoder;
43 import java.util.ArrayList;
44 import java.util.Collections;
45 import java.util.Comparator;
46 import java.util.Locale;
47 import java.util.regex.Matcher;
48 import java.util.regex.Pattern;
49
50 /**
51  * Linkify take a piece of text and a regular expression and turns all of the
52  * regex matches in the text into clickable links. This is particularly
53  * useful for matching things like email addresses, web URLs, etc. and making
54  * them actionable.
55  *
56  * Alone with the pattern that is to be matched, a URL scheme prefix is also
57  * required. Any pattern match that does not begin with the supplied scheme
58  * will have the scheme prepended to the matched text when the clickable URL
59  * is created. For instance, if you are matching web URLs you would supply
```

```

60 * the scheme <code>http://</code>. If the pattern matches example.com, which
61 * does not have a URL scheme prefix, the supplied scheme will be prepended to
62 * create <code>http://example.com</code> when the clickable URL link is
63 * created.
64 */
65
66 public class Linkify {
67     /**
68      * Bit field indicating that web URLs should be matched in methods that
69      * take an options mask
70      */
71     public static final int WEB_URLS = 0x01;
72
73     /**
74      * Bit field indicating that email addresses should be matched in methods
75      * that take an options mask
76      */
77     public static final int EMAIL_ADDRESSES = 0x02;
78
79     /**
80      * Bit field indicating that phone numbers should be matched in methods that
81      * take an options mask
82      */
83     public static final int PHONE_NUMBERS = 0x04;
84
85     /**
86      * Bit field indicating that street addresses should be matched in methods that
87      * take an options mask. Note that this uses the
88      * {@link android.webkit.WebView#findAddress(String) findAddress()} method in
89      * {@link android.webkit.WebView} for finding addresses, which has various
90      * limitations.
91      */
92     public static final int MAP_ADDRESSES = 0x08;
93
94     /**
95      * Bit mask indicating that all available patterns should be matched in
96      * methods that take an options mask
97      */
98     public static final int ALL = WEB_URLS | EMAIL_ADDRESSES | PHONE_NUMBERS |
... MAP_ADDRESSES;
99
100     /**
101      * Don't treat anything with fewer than this many digits as a
102      * phone number.
103      */
104     private static final int PHONE_NUMBER_MINIMUM_DIGITS = 5;
105
106     /** @hide */
107     @IntDef(flag = true, value = { WEB_URLS, EMAIL_ADDRESSES, PHONE_NUMBERS,
... MAP_ADDRESSES, ALL })
108     @Retention(RetentionPolicy.SOURCE)
109     public @interface LinkifyMask {}
110
111     /**
112      * Filters out web URL matches that occur after an at-sign (@). This is
113      * to prevent turning the domain name in an email address into a web link.
114      */
115     public static final MatchFilter sUrlMatchFilter = new MatchFilter() {
116         public final boolean acceptMatch(CharSequence s, int start, int end) {

```

```
117     if (start == 0) {
118         return true;
119     }
120
121     if (s.charAt(start - 1) == '@') {
122         return false;
123     }
124
125     return true;
126 }
127 };
128
129 /**
130  * Filters out URL matches that don't have enough digits to be a
131  * phone number.
132  */
133 public static final MatchFilter sPhoneNumberMatchFilter = new MatchFilter() {
134     public final boolean acceptMatch(CharSequence s, int start, int end) {
135         int digitCount = 0;
136
137         for (int i = start; i < end; i++) {
138             if (Character.isDigit(s.charAt(i))) {
139                 digitCount++;
140                 if (digitCount >= PHONE_NUMBER_MINIMUM_DIGITS) {
141                     return true;
142                 }
143             }
144         }
145         return false;
146     }
147 };
148
149 /**
150  * Transforms matched phone number text into something suitable
151  * to be used in a tel: URL. It does this by removing everything
152  * but the digits and plus signs. For instance:
153  * &apos;+1 (919) 555-1212&apos;
154  * becomes &apos;+19195551212&apos;
155  */
156 public static final TransformFilter sPhoneNumberTransformFilter = new
... TransformFilter() {
157     public final String transformUrl(final Matcher match, String url) {
158         return Patterns.digitsAndPlusOnly(match);
159     }
160 };
161
162 /**
163  * MatchFilter enables client code to have more control over
164  * what is allowed to match and become a link, and what is not.
165  *
166  * For example: when matching web URLs you would like things like
167  * http://www.example.com to match, as well as just example.com itself.
168  * However, you would not want to match against the domain in
169  * support@example.com. So, when matching against a web URL pattern you
170  * might also include a MatchFilter that disallows the match if it is
171  * immediately preceded by an at-sign (@).
172  */
173 public interface MatchFilter {
174     /**
```

```

175 * Examines the character span matched by the pattern and determines
176 * if the match should be turned into an actionable link.
177 *
178 * @param s      The body of text against which the pattern
179 *              was matched
180 * @param start  The index of the first character in s that was
181 *              matched by the pattern - inclusive
182 * @param end    The index of the last character in s that was
183 *              matched - exclusive
184 *
185 * @return      Whether this match should be turned into a link
186 */
187 boolean acceptMatch(CharSequence s, int start, int end);
188 }
189
190 /**
191 * TransformFilter enables client code to have more control over
192 * how matched patterns are represented as URLs.
193 *
194 * For example: when converting a phone number such as (919) 555-1212
195 * into a tel: URL the parentheses, white space, and hyphen need to be
196 * removed to produce tel:9195551212.
197 */
198 public interface TransformFilter {
199     /**
200      * Examines the matched text and either passes it through or uses the
201      * data in the Matcher state to produce a replacement.
202      *
203      * @param match  The regex matcher state that found this URL text
204      * @param url    The text that was matched
205      *
206      * @return      The transformed form of the URL
207      */
208     String transformUrl(final Matcher match, String url);
209 }
210
211 /**
212 * Scans the text of the provided Spannable and turns all occurrences
213 * of the link types indicated in the mask into clickable links.
214 * If the mask is nonzero, it also removes any existing URLSpans
215 * attached to the Spannable, to avoid problems if you call it
216 * repeatedly on the same text.
217 *
218 * @param text Spannable whose text is to be marked-up with links
219 * @param mask Mask to define which kinds of links will be searched.
220 *
221 * @return True if at least one link is found and applied.
222 */
223 public static final boolean addLinks(@NonNull Spannable text, @LinkifyMask int
... mask) {
224     if (mask == 0) {
225         return false;
226     }
227
228     URLSpan[] old = text.getSpans(0, text.length(), URLSpan.class);
229
230     for (int i = old.length - 1; i >= 0; i--) {
231         text.removeSpan(old[i]);
232     }

```

```
233     ArrayList<LinkSpec> links = new ArrayList<LinkSpec>();
234
235
236     if ((mask & WEB_URLS) != 0) {
237         gatherLinks(links, text, Patterns.AUTOLINK_WEB_URL,
238             new String[] { "http://", "https://", "rtsp://" },
239             sUrlMatchFilter, null);
240     }
241
242     if ((mask & EMAIL_ADDRESSES) != 0) {
243         gatherLinks(links, text, Patterns.AUTOLINK_EMAIL_ADDRESS,
244             new String[] { "mailto:" },
245             null, null);
246     }
247
248     if ((mask & PHONE_NUMBERS) != 0) {
249         gatherTelLinks(links, text);
250     }
251
252     if ((mask & MAP_ADDRESSES) != 0) {
253         gatherMapLinks(links, text);
254     }
255
256     pruneOverlaps(links);
257
258     if (links.size() == 0) {
259         return false;
260     }
261
262     for (LinkSpec link: links) {
263         applyLink(link.url, link.start, link.end, text);
264     }
265
266     return true;
267 }
268
269 /**
270  * Scans the text of the provided TextView and turns all occurrences of
271  * the link types indicated in the mask into clickable links. If matches
272  * are found the movement method for the TextView is set to
273  * LinkMovementMethod.
274  *
275  * @param text TextView whose text is to be marked-up with links
276  * @param mask Mask to define which kinds of links will be searched.
277  *
278  * @return True if at least one link is found and applied.
279  */
280 public static final boolean addLinks(@NonNull TextView text, @LinkifyMask int mask)
... {
281     if (mask == 0) {
282         return false;
283     }
284
285     CharSequence t = text.getText();
286
287     if (t instanceof Spannable) {
288         if (addLinks((Spannable) t, mask)) {
289             addLinkMovementMethod(text);
290             return true;

```

```
291     }
292
293     return false;
294 } else {
295     SpannableString s = SpannableString.valueOf(t);
296
297     if (addLinks(s, mask)) {
298         addLinkMovementMethod(text);
299         text.setText(s);
300
301         return true;
302     }
303
304     return false;
305 }
306 }
307
308 private static final void addLinkMovementMethod(@NonNull TextView t) {
309     MovementMethod m = t.getMovementMethod();
310
311     if ((m == null) || !(m instanceof LinkMovementMethod)) {
312         if (t.getLinksClickable()) {
313             t.setMovementMethod(LinkMovementMethod.getInstance());
314         }
315     }
316 }
317
318 /**
319  * Applies a regex to the text of a TextView turning the matches into
320  * links. If links are found then UrlSpans are applied to the link
321  * text match areas, and the movement method for the text is changed
322  * to LinkMovementMethod.
323  *
324  * @param text      TextView whose text is to be marked-up with links
325  * @param pattern    Regex pattern to be used for finding links
326  * @param scheme     URL scheme string (eg <code>http://</code>) to be
327  *                  prepended to the links that do not start with this scheme.
328  */
329 public static final void addLinks(@NonNull TextView text, @NonNull Pattern pattern,
330     @Nullable String scheme) {
331     addLinks(text, pattern, scheme, null, null, null);
332 }
333
334 /**
335  * Applies a regex to the text of a TextView turning the matches into
336  * links. If links are found then UrlSpans are applied to the link
337  * text match areas, and the movement method for the text is changed
338  * to LinkMovementMethod.
339  *
340  * @param text      TextView whose text is to be marked-up with links
341  * @param pattern    Regex pattern to be used for finding links
342  * @param scheme     URL scheme string (eg <code>http://</code>) to be
343  *                  prepended to the links that do not start with this scheme.
344  * @param matchFilter The filter that is used to allow the client code
345  *                   additional control over which pattern matches are
346  *                   to be converted into links.
347  */
348 public static final void addLinks(@NonNull TextView text, @NonNull Pattern pattern,
349     @Nullable String scheme, @Nullable MatchFilter matchFilter,
```

```

350     @Nullable TransformFilter transformFilter) {
351         addLinks(text, pattern, scheme, null, matchFilter, transformFilter);
352     }
353
354     /**
355     * Applies a regex to the text of a TextView turning the matches into
356     * links. If links are found then UrlSpans are applied to the link
357     * text match areas, and the movement method for the text is changed
358     * to LinkMovementMethod.
359     *
360     * @param text TextView whose text is to be marked-up with links.
361     * @param pattern Regex pattern to be used for finding links.
362     * @param defaultScheme The default scheme to be prepended to links if the link
... does not
363     * start with one of the <code>schemes</code> given.
364     * @param schemes Array of schemes (eg <code>http://</code>) to check if the link
... found
365     * contains a scheme. Passing a null or empty value means prepend
... defaultScheme
366     * to all links.
367     * @param matchFilter The filter that is used to allow the client code additional
... control
368     * over which pattern matches are to be converted into links.
369     * @param transformFilter Filter to allow the client code to update the link
... found.
370     */
371     public static final void addLinks(@NonNull TextView text, @NonNull Pattern pattern,
372         @Nullable String defaultScheme, @Nullable String[] schemes,
373         @Nullable MatchFilter matchFilter, @Nullable TransformFilter
... transformFilter) {
374         SpannableString spannable = SpannableString.valueOf(text.getText());
375
376         boolean linksAdded = addLinks(spannable, pattern, defaultScheme, schemes,
... matchFilter,
377             transformFilter);
378         if (linksAdded) {
379             text.setText(spannable);
380             addLinkMovementMethod(text);
381         }
382     }
383
384     /**
385     * Applies a regex to a Spannable turning the matches into
386     * links.
387     *
388     * @param text Spannable whose text is to be marked-up with links
389     * @param pattern Regex pattern to be used for finding links
390     * @param scheme URL scheme string (eg <code>http://</code>) to be
391     * prepended to the links that do not start with this scheme.
392     */
393     public static final boolean addLinks(@NonNull Spannable text, @NonNull Pattern
... pattern,
394         @Nullable String scheme) {
395         return addLinks(text, pattern, scheme, null, null, null);
396     }
397
398     /**
399     * Applies a regex to a Spannable turning the matches into
400     * links.

```



```

401 *
402 * @param spannable Spannable whose text is to be marked-up with links
403 * @param pattern Regex pattern to be used for finding links
404 * @param scheme URL scheme string (eg <code>http://</code>) to be
405 * prepended to the links that do not start with this scheme.
406 * @param matchFilter The filter that is used to allow the client code
407 * additional control over which pattern matches are
408 * to be converted into links.
409 * @param transformFilter Filter to allow the client code to update the link found.
410 *
411 * @return True if at least one link is found and applied.
412 */
413 public static final boolean addLinks(@NonNull Spannable spannable, @NonNull Pattern
... pattern,
414     @Nullable String scheme, @Nullable MatchFilter matchFilter,
415     @Nullable TransformFilter transformFilter) {
416     return addLinks(spannable, pattern, scheme, null, matchFilter,
417         transformFilter);
418 }
419
420 /**
421 * Applies a regex to a Spannable turning the matches into links.
422 *
423 * @param spannable Spannable whose text is to be marked-up with links.
424 * @param pattern Regex pattern to be used for finding links.
425 * @param defaultScheme The default scheme to be prepended to links if the link
... does not
426 * start with one of the <code>schemes</code> given.
427 * @param schemes Array of schemes (eg <code>http://</code>) to check if the link
... found
428 * contains a scheme. Passing a null or empty value means prepend
... defaultScheme
429 * to all links.
430 * @param matchFilter The filter that is used to allow the client code additional
... control
431 * over which pattern matches are to be converted into links.
432 * @param transformFilter Filter to allow the client code to update the link found.
433 *
434 * @return True if at least one link is found and applied.
435 */
436 public static final boolean addLinks(@NonNull Spannable spannable, @NonNull Pattern
... pattern,
437     @Nullable String defaultScheme, @Nullable String[] schemes,
438     @Nullable MatchFilter matchFilter, @Nullable TransformFilter
... transformFilter) {
439     final String[] schemesCopy;
440     if (defaultScheme == null) defaultScheme = "";
441     if (schemes == null || schemes.length < 1) {
442         schemes = EmptyArray.STRING;
443     }
444
445     schemesCopy = new String[schemes.length + 1];
446     schemesCopy[0] = defaultScheme.toLowerCase(Locale.ROOT);
447     for (int index = 0; index < schemes.length; index++) {
448         String scheme = schemes[index];
449         schemesCopy[index + 1] = (scheme == null) ? "" :
... scheme.toLowerCase(Locale.ROOT);
450     }
451

```



```
452     boolean hasMatches = false;
453     Matcher m = pattern.matcher(spannable);
454
455     while (m.find()) {
456         int start = m.start();
457         int end = m.end();
458         boolean allowed = true;
459
460         if (matchFilter != null) {
461             allowed = matchFilter.acceptMatch(spannable, start, end);
462         }
463
464         if (allowed) {
465             String url = makeUrl(m.group(0), schemesCopy, m, transformFilter);
466
467             applyLink(url, start, end, spannable);
468             hasMatches = true;
469         }
470     }
471
472     return hasMatches;
473 }
474
475 private static final void applyLink(String url, int start, int end, Spannable text)
476 {
477     URLSpan span = new URLSpan(url);
478     text.setSpan(span, start, end, Spanned.SPAN_EXCLUSIVE_EXCLUSIVE);
479 }
480
481 private static final String makeUrl(@NonNull String url, @NonNull String[]
482 prefixes,
483     Matcher matcher, @Nullable TransformFilter filter) {
484     if (filter != null) {
485         url = filter.transformUrl(matcher, url);
486     }
487
488     boolean hasPrefix = false;
489
490     for (int i = 0; i < prefixes.length; i++) {
491         if (url.regionMatches(true, 0, prefixes[i], 0, prefixes[i].length())) {
492             hasPrefix = true;
493
494             // Fix capitalization if necessary
495             if (!url.regionMatches(false, 0, prefixes[i], 0, prefixes[i].length()))
496             {
497                 url = prefixes[i] + url.substring(prefixes[i].length());
498             }
499
500             break;
501         }
502     }
503
504     if (!hasPrefix && prefixes.length > 0) {
505         url = prefixes[0] + url;
506     }
507
508     return url;
509 }
```

```
508
509     private static final void gatherLinks(ArrayList<LinkSpec> links,
510         Spannable s, Pattern pattern, String[] schemes,
511         MatchFilter matchFilter, TransformFilter transformFilter) {
512         Matcher m = pattern.matcher(s);
513
514         while (m.find()) {
515             int start = m.start();
516             int end = m.end();
517
518             if (matchFilter == null || matchFilter.acceptMatch(s, start, end)) {
519                 LinkSpec spec = new LinkSpec();
520                 String url = makeUrl(m.group(0), schemes, m, transformFilter);
521
522                 spec.url = url;
523                 spec.start = start;
524                 spec.end = end;
525
526                 links.add(spec);
527             }
528         }
529     }
530
531     private static final void gatherTelLinks(ArrayList<LinkSpec> links, Spannable s) {
532         PhoneNumberUtil phoneUtil = PhoneNumberUtil.getInstance();
533         Iterable<PhoneNumberMatch> matches = phoneUtil.findNumbers(s.toString(),
534             Locale.getDefault().getCountry(), Leniency.POSSIBLE, Long.MAX_VALUE);
535         for (PhoneNumberMatch match : matches) {
536             LinkSpec spec = new LinkSpec();
537             spec.url = "tel:" + PhoneNumberUtils.normalizeNumber(match.rawString());
538             spec.start = match.start();
539             spec.end = match.end();
540             links.add(spec);
541         }
542     }
543
544     private static final void gatherMapLinks(ArrayList<LinkSpec> links, Spannable s) {
545         String string = s.toString();
546         String address;
547         int base = 0;
548
549         try {
550             while ((address = WebView.findAddress(string)) != null) {
551                 int start = string.indexOf(address);
552
553                 if (start < 0) {
554                     break;
555                 }
556
557                 LinkSpec spec = new LinkSpec();
558                 int length = address.length();
559                 int end = start + length;
560
561                 spec.start = base + start;
562                 spec.end = base + end;
563                 string = string.substring(end);
564                 base += end;
565
566                 String encodedAddress = null;
```

```
567         try {
568             encodedAddress = URLEncoder.encode(address, "UTF-8");
569         } catch (UnsupportedEncodingException e) {
570             continue;
571         }
572     }
573
574     spec.url = "geo:0,0?q=" + encodedAddress;
575     links.add(spec);
576 }
577 } catch (UnsupportedOperationException e) {
578     // findAddress may fail with an unsupported exception on platforms without
... a WebView.
579     // In this case, we will not append anything to the links variable: it
... would have died
580     // in WebView.findAddress.
581     return;
582 }
583 }
584
585 private static final void pruneOverlaps(ArrayList<LinkSpec> links) {
586     Comparator<LinkSpec> c = new Comparator<LinkSpec>() {
587         public final int compare(LinkSpec a, LinkSpec b) {
588             if (a.start < b.start) {
589                 return -1;
590             }
591
592             if (a.start > b.start) {
593                 return 1;
594             }
595
596             if (a.end < b.end) {
597                 return 1;
598             }
599
600             if (a.end > b.end) {
601                 return -1;
602             }
603
604             return 0;
605         }
606     };
607
608     Collections.sort(links, c);
609
610     int len = links.size();
611     int i = 0;
612
613     while (i < len - 1) {
614         LinkSpec a = links.get(i);
615         LinkSpec b = links.get(i + 1);
616         int remove = -1;
617
618         if ((a.start <= b.start) && (a.end > b.start)) {
619             if (b.end <= a.end) {
620                 remove = i + 1;
621             } else if ((a.end - a.start) > (b.end - b.start)) {
622                 remove = i + 1;
623             } else if ((a.end - a.start) < (b.end - b.start)) {
```

```
624         remove = 1;
625     }
626
627     if (remove != -1) {
628         links.remove(remove);
629         len--;
630         continue;
631     }
632
633     }
634
635     i++;
636 }
637 }
638 }
639
640 class LinkSpec {
641     String url;
642     int start;
643     int end;
644 }
645
```

EXHIBIT 8

Linkify

The Developer Preview for Android 11 is now available; [test it out and share your feedback](#).

```
public class Linkify
extends Object
```

[java.lang.Object](#)

↳ [android.text.util.Linkify](#)

Linkify take a piece of text and a regular expression and turns all of the regex matches in the text into clickable links. This is particularly useful for matching things like email addresses, web URLs, etc. and making them actionable. Along with the pattern that is to be matched, a URL scheme prefix is also required. Any pattern match that does not begin with the supplied scheme will have the scheme prepended to the matched text when the clickable URL is created. For instance, if you are matching web URLs you would supply the scheme `http://`. If the pattern matches `example.com`, which does not have a URL scheme prefix, the supplied scheme will be prepended to create `http://example.com` when the clickable URL link is created.

Note: When using [MAP_ADDRESSES](#) or [ALL](#) to match street addresses on API level [Build.VERSION_CODES.O_MR1](#) and earlier, methods in this class may throw [AndroidRuntimeException](#) or other exceptions if the device's WebView implementation is currently being updated, because [WebView.findAddress\(String\)](#) is required to match street addresses.

See also:

[Linkify.MatchFilter](#)

[Linkify.TransformFilter](#)

Summary

Nested classes	
interface	<p>Linkify.MatchFilter</p> <p>MatchFilter enables client code to have more control over what is allowed to match and become a link, and what is not.</p>
interface	<p>Linkify.TransformFilter</p> <p>TransformFilter enables client code to have more control over how matched patterns are represented as URLs.</p>

Constants	
int	<p>ALL</p> <p>Bit mask indicating that all available patterns should be matched in methods that take an options mask</p> <p>Note:</p> <p>MAP_ADDRESSES is deprecated.</p>
int	<p>EMAIL_ADDRESSES</p> <p>Bit field indicating that email addresses should be matched in methods that take an options mask</p>
int	<p>MAP_ADDRESSES</p> <p><i>This constant was deprecated in API level 28. use TextClassifier.generateLinks(TextLinks.Request) instead and avoid it even when targeting API levels where no alternative is available.</i></p>
	<p>PHONE_NUMBERS</p>

int	Bit field indicating that phone numbers should be matched in methods that take an options mask
int	WEB_URLS Bit field indicating that web URLs should be matched in methods that take an options mask

Public methods

static final boolean	addLinks(<u>Spannable</u> text, int mask, <u>Function</u><<u>String</u>, <u>URLSpan</u>> <u>urlSpanFactory</u>) Scans the text of the provided Spannable and turns all occurrences of the link types indicated in the mask into clickable links.
static final void	addLinks(<u>TextView</u> text, <u>Pattern</u> pattern, <u>String</u> scheme, <u>Linkify.MatchFilter</u> matchFilter, <u>Linkify.TransformFilter</u> transformFilter) Applies a regex to the text of a TextView turning the matches into links.
static final void	addLinks(<u>TextView</u> text, <u>Pattern</u> pattern, <u>String</u> defaultScheme, <u>String</u>[] schemes, <u>Linkify.MatchFilter</u> matchFilter, <u>Linkify.TransformFilter</u> transformFilter) Applies a regex to the text of a TextView turning the matches into links.
static final boolean	addLinks(<u>Spannable</u> spannable, <u>Pattern</u> pattern, <u>String</u> defaultScheme, <u>String</u>[] schemes, <u>Linkify.MatchFilter</u> matchFilter, <u>Linkify.TransformFilter</u> transformFilter) Applies a regex to a Spannable turning the matches into links.
static final boolean	addLinks(<u>Spannable</u> text, <u>Pattern</u> pattern, <u>String</u> scheme) Applies a regex to a Spannable turning the matches into links.
static final boolean	addLinks(<u>Spannable</u> text, int mask) Scans the text of the provided Spannable and turns all occurrences of the link types indicated in the mask into clickable links.
static final void	addLinks(<u>TextView</u> text, <u>Pattern</u> pattern, <u>String</u> scheme) Applies a regex to the text of a TextView turning the matches into links.
static final	addLinks(<u>Spannable</u> spannable, <u>Pattern</u> pattern, <u>String</u> defaultScheme, <u>String</u>[] schemes, <u>Linkify.MatchFilter</u> matchFilter, <u>Linkify.TransformFilter</u> transformFilter, <u>Function</u><<u>String</u>, <u>URLSpan</u>>

boolean	urlSpanFactory) Applies a regex to a Spannable turning the matches into links.
static final boolean	addLinks(Spannable spannable, Pattern pattern, String scheme, Linkify.MatchFilter matchFilter, Linkify.TransformFilter transformFilter) Applies a regex to a Spannable turning the matches into links.
static final boolean	addLinks(TextView text, int mask) Scans the text of the provided TextView and turns all occurrences of the link types indicated in the mask into clickable links.

Constants

ALL

Added in [API level 1](#)

```
public static final int ALL
```

Bit mask indicating that all available patterns should be matched in methods that take an options mask

Note:

[MAP_ADDRESSES](#) is deprecated. Use

[TextClassifier.generateLinks\(TextLinks.Request\)](#) instead and avoid it even when targeting API levels where no alternative is available.

Constant Value: 15 (0x0000000f)

EMAIL_ADDRESSES

Added in [API level 1](#)

```
public static final int EMAIL_ADDRESSES
```

Bit field indicating that email addresses should be matched in methods that take an options mask

Constant Value: 2 (0x00000002)

MAP_ADDRESSES

```
public static final int MAP_ADDRESSES
```

This constant was deprecated in API level 28.

USE [TextClassifier.generateLinks\(TextLinks.Request\)](#) instead and avoid it even when targeting API levels where no alternative is available.

Bit field indicating that street addresses should be matched in methods that take an options mask. Note that this should be avoided, as it uses the [WebView.findAddress\(String\)](#) method, which has various limitations and has been deprecated: see the documentation for [WebView.findAddress\(String\)](#) for more information.

Constant Value: 8 (0x00000008)

PHONE_NUMBERS

Added in [API level 1](#)

```
public static final int PHONE_NUMBERS
```

Bit field indicating that phone numbers should be matched in methods that

take an options mask

Constant Value: 4 (0x00000004)

WEB_URLS

Added in [API level 1](#)

```
public static final int WEB_URLS
```

Bit field indicating that web URLs should be matched in methods that take an options mask

Constant Value: 1 (0x00000001)

Fields

sPhoneNumberMatchFilter

Added in [API level 1](#)

```
public static final Linkify.MatchFilter sPhoneNumberMatchFilter
```

Filters out URL matches that don't have enough digits to be a phone number.

sPhoneNumberTransformFilter

Added in [API level 1](#)

```
public static final Linkify.TransformFilter sPhoneNumberTransformFilter
```

Transforms matched phone number text into something suitable to be used in a tel: URL. It does this by removing everything but the digits and plus signs. For instance: '+1 (919) 555-1212' becomes '+19195551212'

sUrlMatchFilter

Added in [API level 1](#)

```
public static final Linkify.MatchFilter sUrlMatchFilter
```

Filters out web URL matches that occur after an at-sign (@). This is to prevent turning the domain name in an email address into a web link.

Public constructors

Linkify

```
public Linkify ()
```

Public methods

addLinks

```
public static final boolean addLinks (Spannable text,  
int mask,  
Function<String, URLSpan> urlSpanFactory)
```

Scans the text of the provided Spannable and turns all occurrences of the link types indicated in the mask into clickable links. If the mask is nonzero, it also removes any existing URLSpans attached to the Spannable, to avoid

problems if you call it repeatedly on the same text.

Parameters	
text	Spannable: Spannable whose text is to be marked-up with links This value must never be <code>null</code> .
mask	int: mask to define which kinds of links will be searched Value is either 0 or a combination of WEB_URLS , EMAIL_ADDRESSES , PHONE_NUMBERS , MAP_ADDRESSES , and ALL
urlSpanFactory	Function: function used to create URLSpans This value may be <code>null</code> .

Returns	
boolean	True if at least one link is found and applied.

addLinks

```
public static final void addLinks (TextView text,
    Pattern pattern,
    String scheme,
    Linkify.MatchFilter matchFilter,
    Linkify.TransformFilter transformFilter)
```

Applies a regex to the text of a `TextView` turning the matches into links. If links are found then `UrlSpans` are applied to the link text match areas, and the movement method for the text is changed to `LinkMovementMethod`.

Parameters	
text	TextView: <code>TextView</code> whose text is to be marked-up with links This value must never be <code>null</code> .
pattern	Pattern: Regex pattern to be used for finding links This value must never be <code>null</code> .
	String: URL scheme string (eg <code>http://</code>) to be prepended to

scheme	the links that do not start with this scheme. This value may be null .
matchFilter	Linkify.MatchFilter : The filter that is used to allow the client code additional control over which pattern matches are to be converted into links. This value may be null .
transformFilter	Linkify.TransformFilter : This value may be null .

addLinks

```
public static final void addLinks (TextView text,
    Pattern pattern,
    String defaultScheme,
    String[] schemes,
    Linkify.MatchFilter matchFilter,
    Linkify.TransformFilter transformFilter)
```

Applies a regex to the text of a `TextView` turning the matches into links. If links are found then `UrlSpans` are applied to the link text match areas, and the movement method for the text is changed to `LinkMovementMethod`.

Parameters	
text	TextView : <code>TextView</code> whose text is to be marked-up with links. This value must never be null .
pattern	Pattern : Regex pattern to be used for finding links. This value must never be null .
defaultScheme	String : The default scheme to be prepended to links if the link does not start with one of the schemes given. This value may be null .
schemes	String : Array of schemes (eg <code>http://</code>) to check if the link found contains a scheme. Passing a null or empty value means prepend <code>defaultScheme</code> to all links. This value may be null .
matchFilter	Linkify.MatchFilter : The filter that is used to allow the client code additional control over which pattern matches are to be

	converted into links. This value may be <code>null</code> .
transformFilter	Linkify.TransformFilter : Filter to allow the client code to update the link found. This value may be <code>null</code> .

addLinks

```
public static final boolean addLinks (Spannable spannable,
                                     Pattern pattern,
                                     String defaultScheme,
                                     String\[\] schemes,
                                     Linkify.MatchFilter matchFilter,
                                     Linkify.TransformFilter transformFilter)
```

Applies a regex to a `Spannable` turning the matches into links.

Parameters	
spannable	Spannable : <code>Spannable</code> whose text is to be marked-up with links. This value must never be <code>null</code> .
pattern	Pattern : Regex pattern to be used for finding links. This value must never be <code>null</code> .
defaultScheme	String : The default scheme to be prepended to links if the link does not start with one of the <code>schemes</code> given. This value may be <code>null</code> .
schemes	String : Array of schemes (eg <code>http://</code>) to check if the link found contains a scheme. Passing a null or empty value means prepend <code>defaultScheme</code> to all links. This value may be <code>null</code> .
matchFilter	Linkify.MatchFilter : The filter that is used to allow the client code additional control over which pattern matches are to be converted into links. This value may be <code>null</code> .
transformFilter	Linkify.TransformFilter : Filter to allow the client code to update the link found. This value may be <code>null</code> .
Returns	

boolean	True if at least one link is found and applied.
----------------	---

See also:

[addLinks\(Spannable, Pattern, String, String\[\], MatchFilter, TransformFilter, Function\)](#)

addLinks

```
public static final boolean addLinks (Spannable text,
                                     Pattern pattern,
                                     String scheme)
```

Applies a regex to a Spannable turning the matches into links.

Parameters	
text	Spannable: Spannable whose text is to be marked-up with links This value must never be <code>null</code> .
pattern	Pattern: Regex pattern to be used for finding links This value must never be <code>null</code> .
scheme	String: URL scheme string (eg <code>http://</code>) to be prepended to the links that do not start with this scheme. This value may be <code>null</code> .

Returns	
boolean	

See also:

[addLinks\(Spannable, Pattern, String, String\[\], MatchFilter, TransformFilter, Function\)](#)

addLinks

```
public static final boolean addLinks (Spannable text,
                                     int mask)
```

Scans the text of the provided [Spannable](#) and turns all occurrences of the link types indicated in the mask into clickable links. If the mask is nonzero, it also removes any existing [URLSpans](#) attached to the [Spannable](#), to avoid problems if you call it repeatedly on the same text.

Returns

boolean	True if at least one link is found and applied.
----------------	---

See also:

[addLinks\(\[Spannable\]\(#\), \[int\]\(#\), \[Function\]\(#\)\)](#)

addLinks

```
public static final void addLinks (TextView text,
                                   Pattern pattern,
                                   String scheme)
```

Applies a regex to the text of a [TextView](#) turning the matches into links. If links are found then [UrlSpans](#) are applied to the link text match areas, and the movement method for the text is changed to [LinkMovementMethod](#).

Parameters

text	TextView: TextView whose text is to be marked-up with links This value must never be <code>null</code> .
-------------	---

pattern	Pattern: Regex pattern to be used for finding links This value must never be <code>null</code> .
scheme	String: URL scheme string (eg <code>http://</code>) to be prepended to the links that do not start with this scheme. This value may be <code>null</code> .

addLinks

```
public static final boolean addLinks (Spannable spannable,
                                     Pattern pattern,
                                     String defaultScheme,
                                     String\[\] schemes,
                                     Linkify.MatchFilter matchFilter,
                                     Linkify.TransformFilter transformFilter,
                                     Function<String, URLSpan> urlSpanFactory)
```

Applies a regex to a `Spannable` turning the matches into links.

Parameters	
spannable	Spannable: spannable whose text is to be marked-up with links. This value must never be <code>null</code> .
pattern	Pattern: regex pattern to be used for finding links. This value must never be <code>null</code> .
defaultScheme	String: the default scheme to be prepended to links if the link does not start with one of the <code>schemes</code> given. This value may be <code>null</code> .
schemes	String: array of schemes (eg <code>http://</code>) to check if the link found contains a scheme. Passing a null or empty value means prepend <code>defaultScheme</code> to all links. This value may be <code>null</code> .
matchFilter	Linkify.MatchFilter: the filter that is used to allow the client code additional control over which pattern matches are to be converted into links. This value may be <code>null</code> .
transformFilter	Linkify.TransformFilter: filter to allow the client code to update the link found. This value may be <code>null</code> .

urlSpanFactory	Function: function used to create URLSpan s This value may be null .
-----------------------	--

Returns

boolean	True if at least one link is found and applied.
----------------	---

addLinks

```
public static final boolean addLinks (Spannable spannable,
                                     Pattern pattern,
                                     String scheme,
                                     Linkify.MatchFilter matchFilter,
                                     Linkify.TransformFilter transformFilter)
```

Applies a regex to a Spannable turning the matches into links.

Parameters

spannable	Spannable: Spannable whose text is to be marked-up with links This value must never be null .
pattern	Pattern: Regex pattern to be used for finding links This value must never be null .
scheme	String: URL scheme string (eg <code>http://</code>) to be prepended to the links that do not start with this scheme. This value may be null .
matchFilter	Linkify.MatchFilter: The filter that is used to allow the client code additional control over which pattern matches are to be converted into links. This value may be null .
transformFilter	Linkify.TransformFilter: Filter to allow the client code to update the link found. This value may be null .

Returns

boolean	True if at least one link is found and applied.
----------------	---

See also:

[addLinks\(Spannable, Pattern, String, String\[\], MatchFilter, TransformFilter, Function\)](#)

addLinks

```
public static final boolean addLinks (TextView text,  
                                     int mask)
```

Scans the text of the provided `TextView` and turns all occurrences of the link types indicated in the mask into clickable links. If matches are found the movement method for the `TextView` is set to `LinkMovementMethod`.

Returns	
<code>boolean</code>	True if at least one link is found and applied.

See also:

[addLinks\(Spannable, int, Function\)](#)

EXHIBIT 9

Intent

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels)

[Kotlin](/reference/kotlin/android/content/Intent) | **Java**

```
public class Intent
extends Object implements Parcelable, Cloneable
(/reference/java/lang/Cloneable)
```

[java.lang.Object](/reference/java/lang/Object)

↳ [android.content.Intent](#)

Known direct subclasses

[LabeledIntent](/reference/android/content/pm/LabeledIntent)

[LabeledIntent](/reference/android/content/pm/LabeledIntent)

(/reference/android/content/pm/LabeledIntent)

A special subclass of Intent that can have a custom label/icon associated with it.

An intent is an abstract description of an operation to be performed. It can be used with [Context.startActivity\(Intent\)](/reference/android/content/Context#startActivity(Intent)) (/reference/android/content/Context#startActivity(android.content.Intent)) to launch an [Activity](/reference/android/app/Activity) (/reference/android/app/Activity), [broadcastIntent](/reference/android/content/Context#sendBroadcast(Intent)) (/reference/android/content/Context#sendBroadcast(android.content.Intent)) to send it to any interested [BroadcastReceiver](/reference/android/content/BroadcastReceiver) (/reference/android/content/BroadcastReceiver) components, and [Context.startService\(Intent\)](/reference/android/content/Context#startService(Intent)) (/reference/android/content/Context#startService(android.content.Intent)) or [Context.bindService\(Intent, ServiceConnection, int\)](/reference/android/content/Context#bindService(Intent, ServiceConnection, int)) (/reference/android/content/Context#bindService(android.content.Intent,%20android.content.ServiceConnection,%20int)) to communicate with a background [Service](/reference/android/app/Service) (/reference/android/app/Service).

An Intent provides a facility for performing late runtime binding between the code in different applications. Its most significant use is in the launching of activities, where it can be thought of as the glue between activities. It is basically a passive data structure holding an abstract description of an action to be performed.

Developer Guides

For information about how to create and resolve intents, read the [Intents and Intent Filters \(/guide/topics/intents/intents-filters\)](/guide/topics/intents/intents-filters) developer guide.

Intent Structure

The primary pieces of information in an intent are:

- **action** -- The general action to be performed, such as [ACTION_VIEW \(/reference/android/content/Intent#ACTION_VIEW\)](/reference/android/content/Intent#ACTION_VIEW), [ACTION_EDIT \(/reference/android/content/Intent#ACTION_EDIT\)](/reference/android/content/Intent#ACTION_EDIT), [ACTION_MAIN \(/reference/android/content/Intent#ACTION_MAIN\)](/reference/android/content/Intent#ACTION_MAIN), etc.
- **data** -- The data to operate on, such as a person record in the contacts database, expressed as a [Uri \(/reference/android/net/Uri\)](/reference/android/net/Uri).

Some examples of action/data pairs are:

- [ACTION_VIEW \(/reference/android/content/Intent#ACTION_VIEW\)](/reference/android/content/Intent#ACTION_VIEW) **content://contacts/people/1** -- Display information about the person whose identifier is "1".
- [ACTION_DIAL \(/reference/android/content/Intent#ACTION_DIAL\)](/reference/android/content/Intent#ACTION_DIAL) **content://contacts/people/1** -- Display the phone dialer with the person filled in.
- [ACTION_VIEW \(/reference/android/content/Intent#ACTION_VIEW\)](/reference/android/content/Intent#ACTION_VIEW) **tel:123** -- Display the phone dialer with the given number filled in. Note how the VIEW action does what is considered the most reasonable thing for a particular URI.
- [ACTION_DIAL \(/reference/android/content/Intent#ACTION_DIAL\)](/reference/android/content/Intent#ACTION_DIAL) **tel:123** -- Display the phone dialer with the given number filled in.

- **ACTION_EDIT** (/reference/android/content/Intent#ACTION_EDIT) **content://contacts/people/1** -- Edit information about the person whose identifier is "1".
- **ACTION_VIEW** (/reference/android/content/Intent#ACTION_VIEW) **content://contacts/people/** -- Display a list of people, which the user can browse through. This example is a typical top-level entry into the Contacts application, showing you the list of people. Selecting a particular person to view would result in a new intent { **ACTION_VIEW** (/reference/android/content/Intent#ACTION_VIEW) **content://contacts/people/N** } being used to start an activity to display that person.

In addition to these primary attributes, there are a number of secondary attributes that you can also include with an intent:

- **category** -- Gives additional information about the action to execute. For example, **CATEGORY_LAUNCHER** (/reference/android/content/Intent#CATEGORY_LAUNCHER) means it should appear in the Launcher as a top-level application, while **CATEGORY_ALTERNATIVE** (/reference/android/content/Intent#CATEGORY_ALTERNATIVE) means it should be included in a list of alternative actions the user can perform on a piece of data.
- **type** -- Specifies an explicit type (a MIME type) of the intent data. Normally the type is inferred from the data itself. By setting this attribute, you disable that evaluation and force an explicit type.
- **component** -- Specifies an explicit name of a component class to use for the intent. Normally this is determined by looking at the other information in the intent (the action, data/type, and categories) and matching that with a component that can handle it. If this attribute is set then none of the evaluation is performed, and this component is used exactly as is. By specifying this attribute, all of the other Intent attributes become optional.
- **extras** -- This is a **Bundle** (/reference/android/os/Bundle) of any additional information. This can be used to provide extended information to the component. For example, if we have an action to send an e-mail message, we could also include extra pieces of data here to supply a subject, body, etc.

Here are some examples of other operations you can specify as intents using these additional parameters:

- **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) **with category CATEGORY_HOME** (/reference/android/content/Intent#CATEGORY_HOME) -- Launch the home screen.

- **ACTION_GET_CONTENT** (/reference/android/content/Intent#ACTION_GET_CONTENT) **with MIME type vnd.android.cursor.item/phone** (/reference/android/provider/Contacts.Phones#CONTENT_URI) -- Display the list of people's phone numbers, allowing the user to browse through them and pick one and return it to the parent activity.
- **ACTION_GET_CONTENT** (/reference/android/content/Intent#ACTION_GET_CONTENT) **with MIME type */* and category CATEGORY_OPENABLE** (/reference/android/content/Intent#CATEGORY_OPENABLE) -- Display all pickers for data that can be opened with **ContentResolver#openInputStream(Uri)**. (/reference/android/content/ContentResolver#openInputStream(android.net.Uri)), allowing the user to pick one of them and then some data inside of it and returning the resulting URI to the caller. This can be used, for example, in an e-mail application to allow the user to pick some data to include as an attachment.

There are a variety of standard Intent action and category constants defined in the Intent class, but applications can also define their own. These strings use Java-style scoping, to ensure they are unique -- for example, the standard **ACTION_VIEW** (/reference/android/content/Intent#ACTION_VIEW) is called "android.intent.action.VIEW".

Put together, the set of actions, data types, categories, and extra data defines a language for the system allowing for the expression of phrases such as "call john smith's cell". As applications are added to the system, they can extend this language by adding new actions, types, and categories, or they can modify the behavior of existing phrases by supplying their own activities that handle them.

Intent Resolution

There are two primary forms of intents you will use.

- **Explicit Intents** have specified a component (via **setComponent(ComponentName)**. (/reference/android/content/Intent#setComponent(android.content.ComponentName)) or **setClass(Context, Class)**. (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>))), which provides the exact class to be run. Often these will not include any other information, simply being a way for an application to launch various internal activities it has as the user interacts with the application.
- **Implicit Intents** have not specified a component; instead, they must include enough information for the system to determine which of the available components is best to run for that intent.

When using implicit intents, given such an arbitrary intent we need to know what to do with it. This is handled by the process of *Intent resolution*, which maps an Intent to an [Activity](/reference/android/app/Activity), [BroadcastReceiver](/reference/android/content/BroadcastReceiver), or [Service](/reference/android/app/Service) (or sometimes two or more activities/receivers) that can handle it.

The intent resolution mechanism basically revolves around matching an Intent against all of the <intent-filter> descriptions in the installed application packages. (Plus, in the case of broadcasts, any [BroadcastReceiver](/reference/android/content/BroadcastReceiver) objects explicitly registered with [Context#registerReceiver](/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)) (/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)).) More details on this can be found in the documentation on the [IntentFilter](/reference/android/content/IntentFilter) (/reference/android/content/IntentFilter) class.

There are three pieces of information in the Intent that are used for resolution: the action, type, and category. Using this information, a query is done on the [PackageManager](/reference/android/content/pm/PackageManager) (/reference/android/content/pm/PackageManager) for a component that can handle the intent. The appropriate component is determined based on the intent information supplied in the `AndroidManifest.xml` file as follows:

- The **action**, if given, must be listed by the component as one it handles.
- The **type** is retrieved from the Intent's data, if not already supplied in the Intent. Like the action, if a type is included in the intent (either explicitly or implicitly in its data), then this must be listed by the component as one it handles.
- For data that is not a `content: URI` and where no explicit type is included in the Intent, instead the **scheme** of the intent data (such as `http:` or `mailto:`) is considered. Again like the action, if we are matching a scheme it must be listed by the component as one it can handle.
- The **categories**, if supplied, must *all* be listed by the activity as categories it handles. That is, if you include the categories [CATEGORY_LAUNCHER](/reference/android/content/Intent#CATEGORY_LAUNCHER) (/reference/android/content/Intent#CATEGORY_LAUNCHER) and [CATEGORY_ALTERNATIVE](/reference/android/content/Intent#CATEGORY_ALTERNATIVE) (/reference/android/content/Intent#CATEGORY_ALTERNATIVE), then you will only resolve to components with an intent that lists *both* of those categories. Activities will very often need to support the [CATEGORY_DEFAULT](/reference/android/content/Intent#CATEGORY_DEFAULT) (/reference/android/content/Intent#CATEGORY_DEFAULT) so that they can be found by [Context#startActivity](/reference/android/content/Context#startActivity(android.content.Intent)) (/reference/android/content/Context#startActivity(android.content.Intent)).

For example, consider the Note Pad sample application that allows a user to browse through a list of notes data and view details about individual items. Text in italics indicates places where you would replace a name with one specific to your own package.

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.android.notepad">
    <application android:icon="@drawable/app_notes"
        android:label="@string/app_name">

        <provider class=".NotePadProvider"
            android:authorities="com.google.provider.NotePad" />

        <activity class=".NotesList" android:label="@string/title_notes_list">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
            <intent-filter>
                <action android:name="android.intent.action.VIEW" />
                <action android:name="android.intent.action.EDIT" />
                <action android:name="android.intent.action.PICK" />
                <category android:name="android.intent.category.DEFAULT" />
                <data android:mimeType="vnd.android.cursor.dir/vnd.google.note" />
            </intent-filter>
            <intent-filter>
                <action android:name="android.intent.action.GET_CONTENT" />
                <category android:name="android.intent.category.DEFAULT" />
                <data android:mimeType="vnd.android.cursor.item/vnd.google.note" />
            </intent-filter>
        </activity>

        <activity class=".NoteEditor" android:label="@string/title_note">
            <intent-filter android:label="@string/resolve_edit">
                <action android:name="android.intent.action.VIEW" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

```
<action android:name="android.intent.action.EDIT" />
<category android:name="android.intent.category.DEFAULT" />
<data android:mimeType="vnd.android.cursor.item/vnd.google.note" />
</intent-filter>

<intent-filter>
  <action android:name="android.intent.action.INSERT" />
  <category android:name="android.intent.category.DEFAULT" />
  <data android:mimeType="vnd.android.cursor.dir/vnd.google.note" />
</intent-filter>

</activity>

<activity class=".TitleEditor" android:label="@string/title_edit_title"
  android:theme="@android:style/Theme.Dialog">
  <intent-filter android:label="@string/resolve_title">
    <action android:name="com.android.notepad.action.EDIT_TITLE" />
    <category android:name="android.intent.category.DEFAULT" />
    <category android:name="android.intent.category.ALTERNATIVE" />
    <category android:name="android.intent.category.SELECTED_ALTERNATIVE" />
    <data android:mimeType="vnd.android.cursor.item/vnd.google.note" />
  </intent-filter>
</activity>

</application>
</manifest>
```

The first activity, `com.android.notepad.NotesList`, serves as our main entry into the app. It can do three things as described by its three intent templates:

1. `<intent-filter>`
`<action android:name="android.intent.action.MAIN (reference/android/content/Intent#ACTION_MAIN)" />`

```
<category android:name="android.intent.category.LAUNCHER (/reference/android/content/Intent#CATEGORY_LAUNCHER)"
</intent-filter>
```

This provides a top-level entry into the NotePad application: the standard MAIN action is a main entry point (not requiring any other information in the Intent), and the LAUNCHER category says that this entry point should be listed in the application launcher.

```
2. <intent-filter>
  <action android:name="android.intent.action.VIEW (/reference/android/content/Intent#ACTION_VIEW)" />
  <action android:name="android.intent.action.EDIT (/reference/android/content/Intent#ACTION_EDIT)" />
  <action android:name="android.intent.action.PICK (/reference/android/content/Intent#ACTION_PICK)" />
  <category android:name="android.intent.category.DEFAULT (/reference/android/content/Intent#CATEGORY_DEFAULT)" />
  <data android:mimeType="vnd.android.cursor.dir/vnd.google.note" />
</intent-filter>
```

This declares the things that the activity can do on a directory of notes. The type being supported is given with the <type> tag, where `vnd.android.cursor.dir/vnd.google.note` is a URI from which a Cursor of zero or more items (`vnd.android.cursor.dir`) can be retrieved which holds our note pad data (`vnd.google.note`). The activity allows the user to view or edit the directory of data (via the VIEW and EDIT actions), or to pick a particular note and return it to the caller (via the PICK action). Note also the DEFAULT category supplied here: this is *required* for the [Context#startActivity](#) (`/reference/android/content/Context#startActivity(android.content.Intent)`) method to resolve your activity when its component name is not explicitly specified.

```
3. <intent-filter>
  <action android:name="android.intent.action.GET_CONTENT (/reference/android/content/Intent#ACTION_GET_CONTENT)"
  <category android:name="android.intent.category.DEFAULT (/reference/android/content/Intent#CATEGORY_DEFAULT)" />
  <data android:mimeType="vnd.android.cursor.item/vnd.google.note" />
</intent-filter>
```

This filter describes the ability to return to the caller a note selected by the user without needing to know where it came from. The data type `vnd.android.cursor.item/vnd.google.note` is a URI from which a Cursor of exactly one (`vnd.android.cursor.item`) item can be retrieved which contains our note pad data (`vnd.google.note`). The `GET_CONTENT` action is similar to the `PICK` action, where the activity will return to its caller a piece of data selected by the user. Here, however, the caller specifies the type of data they desire instead of the type of data the user will be picking from.

Given these capabilities, the following intents will resolve to the `NotesList` activity:

- **{ action=android.app.action.MAIN }** matches all of the activities that can be used as top-level entry points into an application.
- **{ action=android.app.action.MAIN, category=android.app.category.LAUNCHER }** is the actual intent used by the Launcher to populate its top-level list.
- **{ action=android.intent.action.VIEW data=content://com.google.provider.NotePad/notes }** displays a list of all the notes under "content://com.google.provider.NotePad/notes", which the user can browse through and see the details on.
- **{ action=android.app.action.PICK data=content://com.google.provider.NotePad/notes }** provides a list of the notes under "content://com.google.provider.NotePad/notes", from which the user can pick a note whose data URL is returned back to the caller.
- **{ action=android.app.action.GET_CONTENT type=vnd.android.cursor.item/vnd.google.note }** is similar to the pick action, but allows the caller to specify the kind of data they want back so that the system can find the appropriate activity to pick something of that data type.

The second activity, `com.android.notepad.NoteEditor`, shows the user a single note entry and allows them to edit it. It can do two things as described by its two intent templates:

1.

```
<intent-filter android:label="@string/resolve_edit">
  <action android:name="android.intent.action.VIEW" (/reference/android/content/Intent#ACTION_VIEW)" />
  <action android:name="android.intent.action.EDIT" (/reference/android/content/Intent#ACTION_EDIT)" />
```

```
<category android:name="android.intent.category.DEFAULT (/reference/android/content/Intent#CATEGORY_DEFAULT)" />
<data android:mimeType="vnd.android.cursor.item/vnd.google.note" />
</intent-filter>
```

The first, primary, purpose of this activity is to let the user interact with a single note, as described by the MIME type `vnd.android.cursor.item/vnd.google.note`. The activity can either VIEW a note or allow the user to EDIT it. Again we support the DEFAULT category to allow the activity to be launched without explicitly specifying its component.

```
2. <intent-filter>
    <action android:name="android.intent.action.INSERT (/reference/android/content/Intent#ACTION_INSERT)" />
    <category android:name="android.intent.category.DEFAULT (/reference/android/content/Intent#CATEGORY_DEFAULT)" />
    <data android:mimeType="vnd.android.cursor.dir/vnd.google.note" />
</intent-filter>
```

The secondary use of this activity is to insert a new note entry into an existing directory of notes. This is used when the user creates a new note: the INSERT action is executed on the directory of notes, causing this activity to run and have the user create the new note data which it then adds to the content provider.

Given these capabilities, the following intents will resolve to the NoteEditor activity:

- **{ action=android.intent.action.VIEW data=content://com.google.provider.NotePad/notes/{ID} }** shows the user the content of note **{ID}**.
- **{ action=android.app.action.EDIT data=content://com.google.provider.NotePad/notes/{ID} }** allows the user to edit the content of note **{ID}**.
- **{ action=android.app.action.INSERT data=content://com.google.provider.NotePad/notes }** creates a new, empty note in the notes list at "content://com.google.provider.NotePad/notes" and allows the user to edit it. If they keep their changes, the URI of the newly created note is returned to the caller.

The last activity, `com.android.notepad.TitleEditor`, allows the user to edit the title of a note. This could be implemented as a class that the application directly invokes (by explicitly setting its component in the Intent), but here we show a way you can publish alternative operations on existing data:

```
<intent-filter android:label="@string/resolve_title">
  <action android:name="com.android.notepad.action.EDIT_TITLE" />
  <category android:name="android.intent.category.DEFAULT (/reference/android/content/Intent#CATEGORY_DEFAULT)" />
  <category android:name="android.intent.category.ALTERNATIVE (/reference/android/content/Intent#CATEGORY_ALTERNATIVE)" />
  <category android:name="android.intent.category.SELECTED_ALTERNATIVE (/reference/android/content/Intent#CATEGORY_SELECTED_ALTERNATIVE)" />
  <data android:mimeType="vnd.android.cursor.item/vnd.google.note" />
</intent-filter>
```

In the single intent template here, we have created our own private action called `com.android.notepad.action.EDIT_TITLE` which means to edit the title of a note. It must be invoked on a specific note (data type `vnd.android.cursor.item/vnd.google.note`) like the previous view and edit actions, but here displays and edits the title contained in the note data.

In addition to supporting the default category as usual, our title editor also supports two other standard categories: `ALTERNATIVE` and `SELECTED_ALTERNATIVE`. Implementing these categories allows others to find the special action it provides without directly knowing about it, through the [PackageManager.queryIntentActivityOptions\(ComponentName, Intent\[\], Intent, int\)](#) ([/reference/android/content/pm/PackageManager#queryIntentActivityOptions\(android.content.ComponentName,%20android.content.Intent\[\],%20android.content.Intent,%20int\)](#))

method, or more often to build dynamic menu items with [Menu.addIntentOptions\(int, int, int, ComponentName, Intent\[\], Intent, int, MenuItem\[\]\)](#).

([/reference/android/view/Menu#addIntentOptions\(int,%20int,%20int,%20android.content.ComponentName,%20android.content.Intent\[\],%20android.content.Intent,%20int,%20android.view.MenuItem\[\]\)](#))

. Note that in the intent template here was also supply an explicit name for the template (via `android:label="@string/resolve_title"`) to better control what the user sees when presented with this activity as an alternative action to the data they are viewing.

Given these capabilities, the following intent will resolve to the TitleEditor activity:

- **{ action=com.android.notepad.action.EDIT_TITLE data=content://com.google.provider.NotePad/notes/{ID} }** displays and allows the user to edit the title associated with note **{ID}**.

Standard Activity Actions

These are the current standard actions that Intent defines for launching activities (usually through [Context#startActivity](#) (/reference/android/content/Context#startActivity(android.content.Intent))). The most important, and by far most frequently used, are [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) and [ACTION_EDIT](#) (/reference/android/content/Intent#ACTION_EDIT).

- [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN)
- [ACTION_VIEW](#) (/reference/android/content/Intent#ACTION_VIEW)
- [ACTION_ATTACH_DATA](#) (/reference/android/content/Intent#ACTION_ATTACH_DATA)
- [ACTION_EDIT](#) (/reference/android/content/Intent#ACTION_EDIT)
- [ACTION_PICK](#) (/reference/android/content/Intent#ACTION_PICK)
- [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER)
- [ACTION_GET_CONTENT](#) (/reference/android/content/Intent#ACTION_GET_CONTENT)
- [ACTION_DIAL](#) (/reference/android/content/Intent#ACTION_DIAL)
- [ACTION_CALL](#) (/reference/android/content/Intent#ACTION_CALL)
- [ACTION_SEND](#) (/reference/android/content/Intent#ACTION_SEND)
- [ACTION_SENDTO](#) (/reference/android/content/Intent#ACTION_SENDTO)
- [ACTION_ANSWER](#) (/reference/android/content/Intent#ACTION_ANSWER)

- **ACTION_INSERT** (/reference/android/content/Intent#ACTION_INSERT)
- **ACTION_DELETE** (/reference/android/content/Intent#ACTION_DELETE)
- **ACTION_RUN** (/reference/android/content/Intent#ACTION_RUN)
- **ACTION_SYNC** (/reference/android/content/Intent#ACTION_SYNC)
- **ACTION_PICK_ACTIVITY** (/reference/android/content/Intent#ACTION_PICK_ACTIVITY)
- **ACTION_SEARCH** (/reference/android/content/Intent#ACTION_SEARCH)
- **ACTION_WEB_SEARCH** (/reference/android/content/Intent#ACTION_WEB_SEARCH)
- **ACTION_FACTORY_TEST** (/reference/android/content/Intent#ACTION_FACTORY_TEST)

Standard Broadcast Actions

These are the current standard actions that Intent defines for receiving broadcasts (usually through **Context#registerReceiver** (/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)) or a <receiver> tag in a manifest).

- **ACTION_TIME_TICK** (/reference/android/content/Intent#ACTION_TIME_TICK)
- **ACTION_TIME_CHANGED** (/reference/android/content/Intent#ACTION_TIME_CHANGED)
- **ACTION_TIMEZONE_CHANGED** (/reference/android/content/Intent#ACTION_TIMEZONE_CHANGED)
- **ACTION_BOOT_COMPLETED** (/reference/android/content/Intent#ACTION_BOOT_COMPLETED)
- **ACTION_PACKAGE_ADDED** (/reference/android/content/Intent#ACTION_PACKAGE_ADDED)
- **ACTION_PACKAGE_CHANGED** (/reference/android/content/Intent#ACTION_PACKAGE_CHANGED)
- **ACTION_PACKAGE_REMOVED** (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED)

- **ACTION_PACKAGE_RESTARTED** (/reference/android/content/Intent#ACTION_PACKAGE_RESTARTED)
- **ACTION_PACKAGE_DATA_CLEARED** (/reference/android/content/Intent#ACTION_PACKAGE_DATA_CLEARED)
- **ACTION_PACKAGES_SUSPENDED** (/reference/android/content/Intent#ACTION_PACKAGES_SUSPENDED)
- **ACTION_PACKAGES_UNSPENDED** (/reference/android/content/Intent#ACTION_PACKAGES_UNSPENDED)
- **ACTION_UID_REMOVED** (/reference/android/content/Intent#ACTION_UID_REMOVED)
- **ACTION_BATTERY_CHANGED** (/reference/android/content/Intent#ACTION_BATTERY_CHANGED)
- **ACTION_POWER_CONNECTED** (/reference/android/content/Intent#ACTION_POWER_CONNECTED)
- **ACTION_POWER_DISCONNECTED** (/reference/android/content/Intent#ACTION_POWER_DISCONNECTED)
- **ACTION_SHUTDOWN** (/reference/android/content/Intent#ACTION_SHUTDOWN)

Standard Categories

These are the current standard categories that can be used to further clarify an Intent via **addCategory(String)**.
(/reference/android/content/Intent#addCategory(java.lang.String)).

- **CATEGORY_DEFAULT** (/reference/android/content/Intent#CATEGORY_DEFAULT)
- **CATEGORY_BROWSABLE** (/reference/android/content/Intent#CATEGORY_BROWSABLE)
- **CATEGORY_TAB** (/reference/android/content/Intent#CATEGORY_TAB)
- **CATEGORY_ALTERNATIVE** (/reference/android/content/Intent#CATEGORY_ALTERNATIVE)
- **CATEGORY_SELECTED_ALTERNATIVE** (/reference/android/content/Intent#CATEGORY_SELECTED_ALTERNATIVE)
- **CATEGORY_LAUNCHER** (/reference/android/content/Intent#CATEGORY_LAUNCHER)
- **CATEGORY_INFO** (/reference/android/content/Intent#CATEGORY_INFO)

- **CATEGORY_HOME** (/reference/android/content/Intent#CATEGORY_HOME)
- **CATEGORY_PREFERENCE** (/reference/android/content/Intent#CATEGORY_PREFERENCE)
- **CATEGORY_TEST** (/reference/android/content/Intent#CATEGORY_TEST)
- **CATEGORY_CAR_DOCK** (/reference/android/content/Intent#CATEGORY_CAR_DOCK)
- **CATEGORY_DESK_DOCK** (/reference/android/content/Intent#CATEGORY_DESK_DOCK)
- **CATEGORY_LE_DESK_DOCK** (/reference/android/content/Intent#CATEGORY_LE_DESK_DOCK)
- **CATEGORY_HE_DESK_DOCK** (/reference/android/content/Intent#CATEGORY_HE_DESK_DOCK)
- **CATEGORY_CAR_MODE** (/reference/android/content/Intent#CATEGORY_CAR_MODE)
- **CATEGORY_APP_MARKET** (/reference/android/content/Intent#CATEGORY_APP_MARKET)
- **CATEGORY_VR_HOME** (/reference/android/content/Intent#CATEGORY_VR_HOME)

Standard Extra Data

These are the current standard fields that can be used as extra data via **putExtra(String, Bundle)**.
(/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Bundle)).

- **EXTRA_ALARM_COUNT** (/reference/android/content/Intent#EXTRA_ALARM_COUNT)
- **EXTRA_BCC** (/reference/android/content/Intent#EXTRA_BCC)
- **EXTRA_CC** (/reference/android/content/Intent#EXTRA_CC)
- **EXTRA_CHANGED_COMPONENT_NAME** (/reference/android/content/Intent#EXTRA_CHANGED_COMPONENT_NAME)
- **EXTRA_DATA_REMOVED** (/reference/android/content/Intent#EXTRA_DATA_REMOVED)
- **EXTRA_DOCK_STATE** (/reference/android/content/Intent#EXTRA_DOCK_STATE)

- [EXTRA_DOCK_STATE_HE_DESK](/reference/android/content/Intent#EXTRA_DOCK_STATE_HE_DESK) (/reference/android/content/Intent#EXTRA_DOCK_STATE_HE_DESK)
- [EXTRA_DOCK_STATE_LE_DESK](/reference/android/content/Intent#EXTRA_DOCK_STATE_LE_DESK) (/reference/android/content/Intent#EXTRA_DOCK_STATE_LE_DESK)
- [EXTRA_DOCK_STATE_CAR](/reference/android/content/Intent#EXTRA_DOCK_STATE_CAR) (/reference/android/content/Intent#EXTRA_DOCK_STATE_CAR)
- [EXTRA_DOCK_STATE_DESK](/reference/android/content/Intent#EXTRA_DOCK_STATE_DESK) (/reference/android/content/Intent#EXTRA_DOCK_STATE_DESK)
- [EXTRA_DOCK_STATE_UNDOCKED](/reference/android/content/Intent#EXTRA_DOCK_STATE_UNDOCKED) (/reference/android/content/Intent#EXTRA_DOCK_STATE_UNDOCKED)
- [EXTRA_DONT_KILL_APP](/reference/android/content/Intent#EXTRA_DONT_KILL_APP) (/reference/android/content/Intent#EXTRA_DONT_KILL_APP)
- [EXTRA_EMAIL](/reference/android/content/Intent#EXTRA_EMAIL) (/reference/android/content/Intent#EXTRA_EMAIL)
- [EXTRA_INITIAL_INTENTS](/reference/android/content/Intent#EXTRA_INITIAL_INTENTS) (/reference/android/content/Intent#EXTRA_INITIAL_INTENTS)
- [EXTRA_INTENT](/reference/android/content/Intent#EXTRA_INTENT) (/reference/android/content/Intent#EXTRA_INTENT)
- [EXTRA_KEY_EVENT](/reference/android/content/Intent#EXTRA_KEY_EVENT) (/reference/android/content/Intent#EXTRA_KEY_EVENT)
- [EXTRA_ORIGINATING_URI](/reference/android/content/Intent#EXTRA_ORIGINATING_URI) (/reference/android/content/Intent#EXTRA_ORIGINATING_URI)
- [EXTRA_PHONE_NUMBER](/reference/android/content/Intent#EXTRA_PHONE_NUMBER) (/reference/android/content/Intent#EXTRA_PHONE_NUMBER)
- [EXTRA_REFERRER](/reference/android/content/Intent#EXTRA_REFERRER) (/reference/android/content/Intent#EXTRA_REFERRER)
- [EXTRA_REMOTE_INTENT_TOKEN](/reference/android/content/Intent#EXTRA_REMOTE_INTENT_TOKEN) (/reference/android/content/Intent#EXTRA_REMOTE_INTENT_TOKEN)
- [EXTRA_REPLACING](/reference/android/content/Intent#EXTRA_REPLACING) (/reference/android/content/Intent#EXTRA_REPLACING)
- [EXTRA_SHORTCUT_ICON](/reference/android/content/Intent#EXTRA_SHORTCUT_ICON) (/reference/android/content/Intent#EXTRA_SHORTCUT_ICON)
- [EXTRA_SHORTCUT_ICON_RESOURCE](/reference/android/content/Intent#EXTRA_SHORTCUT_ICON_RESOURCE) (/reference/android/content/Intent#EXTRA_SHORTCUT_ICON_RESOURCE)
- [EXTRA_SHORTCUT_INTENT](/reference/android/content/Intent#EXTRA_SHORTCUT_INTENT) (/reference/android/content/Intent#EXTRA_SHORTCUT_INTENT)
- [EXTRA_STREAM](/reference/android/content/Intent#EXTRA_STREAM) (/reference/android/content/Intent#EXTRA_STREAM)

- **EXTRA_SHORTCUT_NAME** (/reference/android/content/Intent#EXTRA_SHORTCUT_NAME)
- **EXTRA_SUBJECT** (/reference/android/content/Intent#EXTRA_SUBJECT)
- **EXTRA_TEMPLATE** (/reference/android/content/Intent#EXTRA_TEMPLATE)
- **EXTRA_TEXT** (/reference/android/content/Intent#EXTRA_TEXT)
- **EXTRA_TITLE** (/reference/android/content/Intent#EXTRA_TITLE)
- **EXTRA_UID** (/reference/android/content/Intent#EXTRA_UID)

Flags

These are the possible flags that can be used in the Intent via **setFlags(int)** (/reference/android/content/Intent#setFlags(int)) and **addFlags(int)** (/reference/android/content/Intent#addFlags(int)). See **setFlags(int)** (/reference/android/content/Intent#setFlags(int)) for a list of all possible flags.

Summary

Nested classes

- | | |
|--------------|--|
| class | <u>Intent.FilterComparison</u> (/reference/android/content/Intent.FilterComparison)
Wrapper class holding an Intent and implementing comparisons on it for the purpose of filtering. |
| class | <u>Intent.ShortcutIconResource</u> (/reference/android/content/Intent.ShortcutIconResource)
Represents a shortcut/live folder icon resource. |

Constants

String (/reference/java/lang/String)	<u>ACTION_AIRPLANE_MODE_CHANGED</u> (/reference/android/content/Intent#ACTION_AIRPLANE_MODE_CHANGED) Broadcast Action: The user has switched the phone into or out of Airplane Mode.
String (/reference/java/lang/String)	<u>ACTION_ALL_APPS</u> (/reference/android/content/Intent#ACTION_ALL_APPS) Activity Action: List all available applications.
String (/reference/java/lang/String)	<u>ACTION_ANSWER</u> (/reference/android/content/Intent#ACTION_ANSWER) Activity Action: Handle an incoming phone call.
String (/reference/java/lang/String)	<u>ACTION_APPLICATION_PREFERENCES</u> (/reference/android/content/Intent#ACTION_APPLICATION_PREFERENCES) An activity that provides a user interface for adjusting application preferences.
String (/reference/java/lang/String)	<u>ACTION_APPLICATION_RESTRICTIONS_CHANGED</u> (/reference/android/content/Intent#ACTION_APPLICATION_RESTRICTIONS_CHANGED) Broadcast Action: Sent after application restrictions are changed.
String (/reference/java/lang/String)	<u>ACTION_APP_ERROR</u> (/reference/android/content/Intent#ACTION_APP_ERROR) Activity Action: The user pressed the "Report" button in the crash/ANR dialog.
String (/reference/java/lang/String)	<u>ACTION_ASSIST</u> (/reference/android/content/Intent#ACTION_ASSIST) Activity Action: Perform assist action.
String (/reference/java/lang/String)	<u>ACTION_ATTACH_DATA</u> (/reference/android/content/Intent#ACTION_ATTACH_DATA) Used to indicate that some piece of data should be attached to some other place.
String (/reference/java/lang/String)	<u>ACTION_BATTERY_CHANGED</u> (/reference/android/content/Intent#ACTION_BATTERY_CHANGED)

Broadcast Action: This is a *sticky broadcast* containing the charging state, level, and other information about the battery.

String

(/reference/java/lang/String)

ACTION_BATTERY_LOW (/reference/android/content/Intent#ACTION_BATTERY_LOW)

Broadcast Action: Indicates low battery condition on the device.

String

(/reference/java/lang/String)

ACTION_BATTERY_OKAY (/reference/android/content/Intent#ACTION_BATTERY_OKAY)

Broadcast Action: Indicates the battery is now okay after being low.

String

(/reference/java/lang/String)

ACTION_BOOT_COMPLETED (/reference/android/content/Intent#ACTION_BOOT_COMPLETED)

Broadcast Action: This is broadcast once, after the user has finished booting.

String

(/reference/java/lang/String)

ACTION_BUG_REPORT (/reference/android/content/Intent#ACTION_BUG_REPORT)

Activity Action: Show activity for reporting a bug.

String

(/reference/java/lang/String)

ACTION_CALL (/reference/android/content/Intent#ACTION_CALL)

Activity Action: Perform a call to someone specified by the data.

String

(/reference/java/lang/String)

ACTION_CALL_BUTTON (/reference/android/content/Intent#ACTION_CALL_BUTTON)

Activity Action: The user pressed the "call" button to go to the dialer or other appropriate UI for placing a call.

String

(/reference/java/lang/String)

ACTION_CAMERA_BUTTON (/reference/android/content/Intent#ACTION_CAMERA_BUTTON)

Broadcast Action: The "Camera Button" was pressed.

String

(/reference/java/lang/String)

ACTION_CARRIER_SETUP (/reference/android/content/Intent#ACTION_CARRIER_SETUP)

Activity Action: Main entry point for carrier setup apps.

String

(/reference/java/lang/String)

ACTION_CHOOSER (/reference/android/content/Intent#ACTION_CHOOSER)

Activity Action: Display an activity chooser, allowing the user to pick what they want to before proceeding.

String (/reference/java/lang/String)	<u>ACTION_CLOSE_SYSTEM_DIALOGS</u> (/reference/android/content/Intent#ACTION_CLOSE_SYSTEM_DIALOGS) Broadcast Action: This is broadcast when a user action should request a temporary system dialog to dismiss.
String (/reference/java/lang/String)	<u>ACTION_CONFIGURATION_CHANGED</u> (/reference/android/content/Intent#ACTION_CONFIGURATION_CHANGED) Broadcast Action: The current device <u>Configuration</u> (/reference/android/content/res/Configuration) (orientation, locale, etc) has changed.
String (/reference/java/lang/String)	<u>ACTION_CREATE_DOCUMENT</u> (/reference/android/content/Intent#ACTION_CREATE_DOCUMENT) Activity Action: Allow the user to create a new document.
String (/reference/java/lang/String)	<u>ACTION_CREATE_REMINDER</u> (/reference/android/content/Intent#ACTION_CREATE_REMINDER) Activity Action: Creates a reminder.
String (/reference/java/lang/String)	<u>ACTION_CREATE_SHORTCUT</u> (/reference/android/content/Intent#ACTION_CREATE_SHORTCUT) Activity Action: Creates a shortcut.
String (/reference/java/lang/String)	<u>ACTION_DATE_CHANGED</u> (/reference/android/content/Intent#ACTION_DATE_CHANGED) Broadcast Action: The date has changed.
String (/reference/java/lang/String)	<u>ACTION_DEFAULT</u> (/reference/android/content/Intent#ACTION_DEFAULT) A synonym for <u>ACTION_VIEW</u> (/reference/android/content/Intent#ACTION_VIEW), the "standard" action that is performed on a piece of data.
String (/reference/java/lang/String)	<u>ACTION_DEFINE</u> (/reference/android/content/Intent#ACTION_DEFINE) Activity Action: Define the meaning of the selected word(s).
String (/reference/java/lang/String)	<u>ACTION_DELETE</u> (/reference/android/content/Intent#ACTION_DELETE) Activity Action: Delete the given data from its container.

<u>String</u> (/reference/java/lang/String)	<u>ACTION_DEVICE_STORAGE_LOW</u> (/reference/android/content/Intent#ACTION_DEVICE_STORAGE_LOW) <i>This constant was deprecated in API level 26. If your app targets <u>Build.VERSION_CODES.O</u> (/reference/android/os/Build.VERSION_CODES#O) or above, this broadcast will no longer be delivered to any <u>BroadcastReceiver</u> (/reference/android/content/BroadcastReceiver) defined in your manifest. Instead, apps are strongly encouraged to use the improved <u>Context#getCacheDir()</u> (/reference/android/content/Context#getCacheDir()) behavior so the system can automatically free up storage when needed.</i>
<u>String</u> (/reference/java/lang/String)	<u>ACTION_DEVICE_STORAGE_OK</u> (/reference/android/content/Intent#ACTION_DEVICE_STORAGE_OK) <i>This constant was deprecated in API level 26. If your app targets <u>Build.VERSION_CODES.O</u> (/reference/android/os/Build.VERSION_CODES#O) or above, this broadcast will no longer be delivered to any <u>BroadcastReceiver</u> (/reference/android/content/BroadcastReceiver) defined in your manifest. Instead, apps are strongly encouraged to use the improved <u>Context#getCacheDir()</u> (/reference/android/content/Context#getCacheDir()) behavior so the system can automatically free up storage when needed.</i>
<u>String</u> (/reference/java/lang/String)	<u>ACTION_DIAL</u> (/reference/android/content/Intent#ACTION_DIAL) Activity Action: Dial a number as specified by the data.
<u>String</u> (/reference/java/lang/String)	<u>ACTION_DOCK_EVENT</u> (/reference/android/content/Intent#ACTION_DOCK_EVENT) Broadcast Action: A sticky broadcast for changes in the physical docking state of the device.
<u>String</u> (/reference/java/lang/String)	<u>ACTION_DREAMING_STARTED</u> (/reference/android/content/Intent#ACTION_DREAMING_STARTED) Broadcast Action: Sent after the system starts dreaming.
<u>String</u> (/reference/java/lang/String)	<u>ACTION_DREAMING_STOPPED</u> (/reference/android/content/Intent#ACTION_DREAMING_STOPPED) Broadcast Action: Sent after the system stops dreaming.
<u>String</u> (/reference/java/lang/String)	<u>ACTION_EDIT</u> (/reference/android/content/Intent#ACTION_EDIT) Activity Action: Provide explicit editable access to the given data.

String (/reference/java/lang/String)	<u>ACTION_EXTERNAL_APPLICATIONS_AVAILABLE</u> (/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_AVAILABLE) Broadcast Action: Resources for a set of packages (which were previously unavailable) are currently available since the media on which they exist is available.
String (/reference/java/lang/String)	<u>ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE</u> (/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE) Broadcast Action: Resources for a set of packages are currently unavailable since the media on which they exist is unavailable.
String (/reference/java/lang/String)	<u>ACTION_FACTORY_TEST</u> (/reference/android/content/Intent#ACTION_FACTORY_TEST) Activity Action: Main entry point for factory tests.
String (/reference/java/lang/String)	<u>ACTION_GET_CONTENT</u> (/reference/android/content/Intent#ACTION_GET_CONTENT) Activity Action: Allow the user to select a particular kind of data and return it.
String (/reference/java/lang/String)	<u>ACTION_GET_RESTRICTION_ENTRIES</u> (/reference/android/content/Intent#ACTION_GET_RESTRICTION_ENTRIES) Broadcast to a specific application to query any supported restrictions to impose on restricted users.
String (/reference/java/lang/String)	<u>ACTION_GTALK_SERVICE_CONNECTED</u> (/reference/android/content/Intent#ACTION_GTALK_SERVICE_CONNECTED) Broadcast Action: A GTalk connection has been established.
String (/reference/java/lang/String)	<u>ACTION_GTALK_SERVICE_DISCONNECTED</u> (/reference/android/content/Intent#ACTION_GTALK_SERVICE_DISCONNECTED) Broadcast Action: A GTalk connection has been disconnected.
String (/reference/java/lang/String)	<u>ACTION_HEADSET_PLUG</u> (/reference/android/content/Intent#ACTION_HEADSET_PLUG) Broadcast Action: Wired Headset plugged in or unplugged.

String (/reference/java/lang/String)	<u>ACTION_INPUT_METHOD_CHANGED</u> (/reference/android/content/Intent#ACTION_INPUT_METHOD_CHANGED) Broadcast Action: An input method has been changed.
String (/reference/java/lang/String)	<u>ACTION_INSERT</u> (/reference/android/content/Intent#ACTION_INSERT) Activity Action: Insert an empty item into the given container.
String (/reference/java/lang/String)	<u>ACTION_INSERT_OR_EDIT</u> (/reference/android/content/Intent#ACTION_INSERT_OR_EDIT) Activity Action: Pick an existing item, or insert a new item, and then edit it.
String (/reference/java/lang/String)	<u>ACTION_INSTALL_FAILURE</u> (/reference/android/content/Intent#ACTION_INSTALL_FAILURE) Activity Action: Activity to handle split installation failures.
String (/reference/java/lang/String)	<u>ACTION_INSTALL_PACKAGE</u> (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) <i>This constant was deprecated in API level 29. use <u>PackageInstaller</u> (/reference/android/content/pm/PackageInstaller) instead</i>
String (/reference/java/lang/String)	<u>ACTION_LOCALE_CHANGED</u> (/reference/android/content/Intent#ACTION_LOCALE_CHANGED) Broadcast Action: The current device's locale has changed.
String (/reference/java/lang/String)	<u>ACTION_LOCKED_BOOT_COMPLETED</u> (/reference/android/content/Intent#ACTION_LOCKED_BOOT_COMPLETED) Broadcast Action: This is broadcast once, after the user has finished booting, but while still in the "locked" state.
String (/reference/java/lang/String)	<u>ACTION_MAIN</u> (/reference/android/content/Intent#ACTION_MAIN) Activity Action: Start as a main entry point, does not expect to receive data.
String (/reference/java/lang/String)	<u>ACTION_MANAGED_PROFILE_ADDED</u> (/reference/android/content/Intent#ACTION_MANAGED_PROFILE_ADDED) Broadcast sent to the primary user when an associated managed profile is added (the profile was created and is ready to be used).

String (/reference/java/lang/String)	<u>ACTION_MANAGED_PROFILE_AVAILABLE</u> (/reference/android/content/Intent#ACTION_MANAGED_PROFILE_AVAILABLE) Broadcast sent to the primary user when an associated managed profile has become available.
String (/reference/java/lang/String)	<u>ACTION_MANAGED_PROFILE_REMOVED</u> (/reference/android/content/Intent#ACTION_MANAGED_PROFILE_REMOVED) Broadcast sent to the primary user when an associated managed profile is removed.
String (/reference/java/lang/String)	<u>ACTION_MANAGED_PROFILE_UNAVAILABLE</u> (/reference/android/content/Intent#ACTION_MANAGED_PROFILE_UNAVAILABLE) Broadcast sent to the primary user when an associated managed profile has become unavailable.
String (/reference/java/lang/String)	<u>ACTION_MANAGED_PROFILE_UNLOCKED</u> (/reference/android/content/Intent#ACTION_MANAGED_PROFILE_UNLOCKED) Broadcast sent to the primary user when the credential-encrypted private storage for an associated managed profile is unlocked.
String (/reference/java/lang/String)	<u>ACTION_MANAGE_NETWORK_USAGE</u> (/reference/android/content/Intent#ACTION_MANAGE_NETWORK_USAGE) Activity Action: Show settings for managing network data usage of a specific application.
String (/reference/java/lang/String)	<u>ACTION_MANAGE_PACKAGE_STORAGE</u> (/reference/android/content/Intent#ACTION_MANAGE_PACKAGE_STORAGE) Broadcast Action: Indicates low memory condition notification acknowledged by user and package management should be started.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_BAD_REMOVAL</u> (/reference/android/content/Intent#ACTION_MEDIA_BAD_REMOVAL) Broadcast Action: External media was removed from SD card slot, but mount point was not unmounted.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_BUTTON</u> (/reference/android/content/Intent#ACTION_MEDIA_BUTTON) Broadcast Action: The "Media Button" was pressed.

String (/reference/java/lang/String)	<u>ACTION_MEDIA_CHECKING</u> (/reference/android/content/Intent#ACTION_MEDIA_CHECKING) Broadcast Action: External media is present, and being disk-checked The path to the mount point for the checking media is contained in the Intent.mData field.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_EJECT</u> (/reference/android/content/Intent#ACTION_MEDIA_EJECT) Broadcast Action: User has expressed the desire to remove the external storage media.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_MOUNTED</u> (/reference/android/content/Intent#ACTION_MEDIA_MOUNTED) Broadcast Action: External media is present and mounted at its mount point.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_NOFS</u> (/reference/android/content/Intent#ACTION_MEDIA_NOFS) Broadcast Action: External media is present, but is using an incompatible fs (or is blank) The path to the mount point for the checking media is contained in the Intent.mData field.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_REMOVED</u> (/reference/android/content/Intent#ACTION_MEDIA_REMOVED) Broadcast Action: External media has been removed.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_SCANNER_FINISHED</u> (/reference/android/content/Intent#ACTION_MEDIA_SCANNER_FINISHED) Broadcast Action: The media scanner has finished scanning a directory.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_SCANNER_SCAN_FILE</u> (/reference/android/content/Intent#ACTION_MEDIA_SCANNER_SCAN_FILE) <i>This constant was deprecated in API level 29. Callers should migrate to inserting items directly into MediaStore (/reference/android/provider/MediaStore), where they will be automatically scanned after each mutation.</i>
String (/reference/java/lang/String)	<u>ACTION_MEDIA_SCANNER_STARTED</u> (/reference/android/content/Intent#ACTION_MEDIA_SCANNER_STARTED) Broadcast Action: The media scanner has started scanning a directory.
String (/reference/java/lang/String)	<u>ACTION_MEDIA_SHARED</u> (/reference/android/content/Intent#ACTION_MEDIA_SHARED)

Broadcast Action: External media is unmounted because it is being shared via USB mass storage.

String

(/reference/java/lang/String)

ACTION_MEDIA_UNMOUNTABLE (/reference/android/content/Intent#ACTION_MEDIA_UNMOUNTABLE)

Broadcast Action: External media is present but cannot be mounted.

String

(/reference/java/lang/String)

ACTION_MEDIA_UNMOUNTED (/reference/android/content/Intent#ACTION_MEDIA_UNMOUNTED)

Broadcast Action: External media is present, but not mounted at its mount point.

String

(/reference/java/lang/String)

ACTION_MY_PACKAGE_REPLACED (/reference/android/content/Intent#ACTION_MY_PACKAGE_REPLACED)

Broadcast Action: A new version of your application has been installed over an existing one.

String

(/reference/java/lang/String)

ACTION_MY_PACKAGE_SUSPENDED (/reference/android/content/Intent#ACTION_MY_PACKAGE_SUSPENDED)

Broadcast Action: Sent to a package that has been suspended by the system.

String

(/reference/java/lang/String)

ACTION_MY_PACKAGE_UNSPENDED (/reference/android/content/Intent#ACTION_MY_PACKAGE_UNSPENDED)

Broadcast Action: Sent to a package that has been unsuspending.

String

(/reference/java/lang/String)

ACTION_NEW_OUTGOING_CALL (/reference/android/content/Intent#ACTION_NEW_OUTGOING_CALL)

*This constant was deprecated in API level 29. Apps that redirect outgoing calls should use the **CallRedirectionService** (/reference/android/telecom/CallRedirectionService) API. Apps that perform call screening should use the **CallScreeningService** (/reference/android/telecom/CallScreeningService) API. Apps which need to be notified of basic call state should use **PhoneStateListener.onCallStateChanged(int, String)** (/reference/android/telephony/PhoneStateListener#onCallStateChanged(int,%20java.lang.String)) to determine when a new outgoing call is placed.*

String

(/reference/java/lang/String)

ACTION_OPEN_DOCUMENT (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT)

Activity Action: Allow the user to select and return one or more existing documents.

String

(/reference/java/lang/String)

ACTION_OPEN_DOCUMENT_TREE (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT_TREE)

Activity Action: Allow the user to pick a directory subtree.

String (/reference/java/lang/String)	<u>ACTION_PACKAGES_SUSPENDED</u> (/reference/android/content/Intent#ACTION_PACKAGES_SUSPENDED) Broadcast Action: Packages have been suspended.
String (/reference/java/lang/String)	<u>ACTION_PACKAGES_UNSUSPENDED</u> (/reference/android/content/Intent#ACTION_PACKAGES_UNSUSPENDED) Broadcast Action: Packages have been unsususpended.
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_ADDED</u> (/reference/android/content/Intent#ACTION_PACKAGE_ADDED) Broadcast Action: A new application package has been installed on the device.
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_CHANGED</u> (/reference/android/content/Intent#ACTION_PACKAGE_CHANGED) Broadcast Action: An existing application package has been changed (for example, a component has been enabled or disabled).
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_DATA_CLEARED</u> (/reference/android/content/Intent#ACTION_PACKAGE_DATA_CLEARED) Broadcast Action: The user has cleared the data of a package.
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_FIRST_LAUNCH</u> (/reference/android/content/Intent#ACTION_PACKAGE_FIRST_LAUNCH) Broadcast Action: Sent to the installer package of an application when that application is first launched (that is the first time it is moved out of the stopped state).
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_FULLY_REMOVED</u> (/reference/android/content/Intent#ACTION_PACKAGE_FULLY_REMOVED) Broadcast Action: An existing application package has been completely removed from the device.
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_INSTALL</u> (/reference/android/content/Intent#ACTION_PACKAGE_INSTALL) <i>This constant was deprecated in API level 15. This constant has never been used.</i>
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_NEEDS_VERIFICATION</u> (/reference/android/content/Intent#ACTION_PACKAGE_NEEDS_VERIFICATION) Broadcast Action: Sent to the system package verifier when a package needs to be verified.

String (/reference/java/lang/String)	<u>ACTION_PACKAGE_REMOVED</u> (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) Broadcast Action: An existing application package has been removed from the device.
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_REPLACED</u> (/reference/android/content/Intent#ACTION_PACKAGE_REPLACED) Broadcast Action: A new version of an application package has been installed, replacing an existing version that was previously installed.
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_RESTARTED</u> (/reference/android/content/Intent#ACTION_PACKAGE_RESTARTED) Broadcast Action: The user has restarted a package, and all of its processes have been killed.
String (/reference/java/lang/String)	<u>ACTION_PACKAGE_VERIFIED</u> (/reference/android/content/Intent#ACTION_PACKAGE_VERIFIED) Broadcast Action: Sent to the system package verifier when a package is verified.
String (/reference/java/lang/String)	<u>ACTION_PASTE</u> (/reference/android/content/Intent#ACTION_PASTE) Activity Action: Create a new item in the given container, initializing it from the current contents of the clipboard.
String (/reference/java/lang/String)	<u>ACTION_PICK</u> (/reference/android/content/Intent#ACTION_PICK) Activity Action: Pick an item from the data, returning what was selected.
String (/reference/java/lang/String)	<u>ACTION_PICK_ACTIVITY</u> (/reference/android/content/Intent#ACTION_PICK_ACTIVITY) Activity Action: Pick an activity given an intent, returning the class selected.
String (/reference/java/lang/String)	<u>ACTION_POWER_CONNECTED</u> (/reference/android/content/Intent#ACTION_POWER_CONNECTED) Broadcast Action: External power has been connected to the device.
String (/reference/java/lang/String)	<u>ACTION_POWER_DISCONNECTED</u> (/reference/android/content/Intent#ACTION_POWER_DISCONNECTED) Broadcast Action: External power has been removed from the device.

String (/reference/java/lang/String)	<u>ACTION_POWER_USAGE_SUMMARY</u> (/reference/android/content/Intent#ACTION_POWER_USAGE_SUMMARY) Activity Action: Show power usage information to the user.
String (/reference/java/lang/String)	<u>ACTION_PROCESS_TEXT</u> (/reference/android/content/Intent#ACTION_PROCESS_TEXT) Activity Action: Process a piece of text.
String (/reference/java/lang/String)	<u>ACTION_PROVIDER_CHANGED</u> (/reference/android/content/Intent#ACTION_PROVIDER_CHANGED) Broadcast Action: Some content providers have parts of their namespace where they publish new events or items that the user may be especially interested in.
String (/reference/java/lang/String)	<u>ACTION_QUICK_CLOCK</u> (/reference/android/content/Intent#ACTION_QUICK_CLOCK) Sent when the user taps on the clock widget in the system's "quick settings" area.
String (/reference/java/lang/String)	<u>ACTION_QUICK_VIEW</u> (/reference/android/content/Intent#ACTION_QUICK_VIEW) Activity Action: Quick view the data.
String (/reference/java/lang/String)	<u>ACTION_REBOOT</u> (/reference/android/content/Intent#ACTION_REBOOT) Broadcast Action: Have the device reboot.
String (/reference/java/lang/String)	<u>ACTION_RUN</u> (/reference/android/content/Intent#ACTION_RUN) Activity Action: Run the data, whatever that means.
String (/reference/java/lang/String)	<u>ACTION_SCREEN_OFF</u> (/reference/android/content/Intent#ACTION_SCREEN_OFF) Broadcast Action: Sent when the device goes to sleep and becomes non-interactive.
String (/reference/java/lang/String)	<u>ACTION_SCREEN_ON</u> (/reference/android/content/Intent#ACTION_SCREEN_ON) Broadcast Action: Sent when the device wakes up and becomes interactive.
String	<u>ACTION_SEARCH</u> (/reference/android/content/Intent#ACTION_SEARCH)

<code>(/reference/java/lang/String)</code>	Activity Action: Perform a search.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SEARCH_LONG_PRESS</u> (<code>/reference/android/content/Intent#ACTION_SEARCH_LONG_PRESS</code>) Activity Action: Start action associated with long pressing on the search key.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SEND</u> (<code>/reference/android/content/Intent#ACTION_SEND</code>) Activity Action: Deliver some data to someone else.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SENDTO</u> (<code>/reference/android/content/Intent#ACTION_SENDTO</code>) Activity Action: Send a message to someone specified by the data.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SEND_MULTIPLE</u> (<code>/reference/android/content/Intent#ACTION_SEND_MULTIPLE</code>) Activity Action: Deliver multiple data to someone else.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SET_WALLPAPER</u> (<code>/reference/android/content/Intent#ACTION_SET_WALLPAPER</code>) Activity Action: Show settings for choosing wallpaper.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SHOW_APP_INFO</u> (<code>/reference/android/content/Intent#ACTION_SHOW_APP_INFO</code>) Activity Action: Launch an activity showing the app information.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SHUTDOWN</u> (<code>/reference/android/content/Intent#ACTION_SHUTDOWN</code>) Broadcast Action: Device is shutting down.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SYNC</u> (<code>/reference/android/content/Intent#ACTION_SYNC</code>) Activity Action: Perform a data synchronization.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_SYSTEM_TUTORIAL</u> (<code>/reference/android/content/Intent#ACTION_SYSTEM_TUTORIAL</code>) Activity Action: Start the platform-defined tutorial

Input: **getStringExtra(SearchManager.QUERY)** (/reference/android/app/SearchManager#QUERY) is the text to search for.

String (/reference/java/lang/String)	<u>ACTION_TIMEZONE_CHANGED</u> (/reference/android/content/Intent#ACTION_TIMEZONE_CHANGED) Broadcast Action: The timezone has changed.
String (/reference/java/lang/String)	<u>ACTION_TIME_CHANGED</u> (/reference/android/content/Intent#ACTION_TIME_CHANGED) Broadcast Action: The time was set.
String (/reference/java/lang/String)	<u>ACTION_TIME_TICK</u> (/reference/android/content/Intent#ACTION_TIME_TICK) Broadcast Action: The current time has changed.
String (/reference/java/lang/String)	<u>ACTION_TRANSLATE</u> (/reference/android/content/Intent#ACTION_TRANSLATE) Activity Action: Perform text translation.
String (/reference/java/lang/String)	<u>ACTION_UID_REMOVED</u> (/reference/android/content/Intent#ACTION_UID_REMOVED) Broadcast Action: A user ID has been removed from the system.
String (/reference/java/lang/String)	<u>ACTION_UMS_CONNECTED</u> (/reference/android/content/Intent#ACTION_UMS_CONNECTED) <i>This constant was deprecated in API level 15. replaced by android.os.storage.StorageEventListener</i>
String (/reference/java/lang/String)	<u>ACTION_UMS_DISCONNECTED</u> (/reference/android/content/Intent#ACTION_UMS_DISCONNECTED) <i>This constant was deprecated in API level 15. replaced by android.os.storage.StorageEventListener</i>
String (/reference/java/lang/String)	<u>ACTION_UNINSTALL_PACKAGE</u> (/reference/android/content/Intent#ACTION_UNINSTALL_PACKAGE) <i>This constant was deprecated in API level 29. Use <u>PackageInstaller.uninstall(String, IntentSender)</u>. (/reference/android/content/pm/PackageInstaller#uninstall(java.lang.String,%20android.content.IntentSender)) instead</i>
String	<u>ACTION_USER_BACKGROUND</u> (/reference/android/content/Intent#ACTION_USER_BACKGROUND)

<code>(/reference/java/lang/String)</code>	Sent when a user switch is happening, causing the process's user to be sent to the background.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_USER_FOREGROUND</u> (<code>/reference/android/content/Intent#ACTION_USER_FOREGROUND</code>) Sent when a user switch is happening, causing the process's user to be brought to the foreground.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_USER_INITIALIZE</u> (<code>/reference/android/content/Intent#ACTION_USER_INITIALIZE</code>) Sent the first time a user is starting, to allow system apps to perform one time initialization.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_USER_PRESENT</u> (<code>/reference/android/content/Intent#ACTION_USER_PRESENT</code>) Broadcast Action: Sent when the user is present after device wakes up (e.g when the keyguard is gone).
String <code>(/reference/java/lang/String)</code>	<u>ACTION_USER_UNLOCKED</u> (<code>/reference/android/content/Intent#ACTION_USER_UNLOCKED</code>) Broadcast Action: Sent when the credential-encrypted private storage has become unlocked for the target user.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_VIEW</u> (<code>/reference/android/content/Intent#ACTION_VIEW</code>) Activity Action: Display the data to the user.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_VIEW_LOCUS</u> (<code>/reference/android/content/Intent#ACTION_VIEW_LOCUS</code>) Activity Action: Display an activity state associated with an unique <u>LocusId</u> (<code>/reference/android/content/LocusId</code>).
String <code>(/reference/java/lang/String)</code>	<u>ACTION_VIEW_PERMISSION_USAGE</u> (<code>/reference/android/content/Intent#ACTION_VIEW_PERMISSION_USAGE</code>) Activity action: Launch UI to show information about the usage of a given permission.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_VOICE_COMMAND</u> (<code>/reference/android/content/Intent#ACTION_VOICE_COMMAND</code>) Activity Action: Start Voice Command.
String <code>(/reference/java/lang/String)</code>	<u>ACTION_WALLPAPER_CHANGED</u> (<code>/reference/android/content/Intent#ACTION_WALLPAPER_CHANGED</code>) <i>This constant was deprecated in API level 16. Modern applications should use <u>WindowManager.LayoutParams.FLAG_SHOW_WALLPAPER</u></i>

(/reference/android/view/WindowManager.LayoutParams#FLAG_SHOW_WALLPAPER) to have the wallpaper shown behind their UI, rather than watching for this broadcast and rendering the wallpaper on their own.

String

(/reference/java/lang/String)

ACTION_WEB_SEARCH (/reference/android/content/Intent#ACTION_WEB_SEARCH)

Activity Action: Perform a web search.

String

(/reference/java/lang/String)

CATEGORY_ACCESSIBILITY_SHORTCUT_TARGET

(/reference/android/content/Intent#CATEGORY_ACCESSIBILITY_SHORTCUT_TARGET)

The accessibility shortcut is a global gesture for users with disabilities to trigger an important for them accessibility feature to help developers determine whether they want to make their activity a shortcut target.

String

(/reference/java/lang/String)

CATEGORY_ALTERNATIVE (/reference/android/content/Intent#CATEGORY_ALTERNATIVE)

Set if the activity should be considered as an alternative action to the data the user is currently viewing.

String

(/reference/java/lang/String)

CATEGORY_APP_BROWSER (/reference/android/content/Intent#CATEGORY_APP_BROWSER)Used with **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) to launch the browser application.**String**

(/reference/java/lang/String)

CATEGORY_APP_CALCULATOR (/reference/android/content/Intent#CATEGORY_APP_CALCULATOR)Used with **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) to launch the calculator application.**String**

(/reference/java/lang/String)

CATEGORY_APP_CALENDAR (/reference/android/content/Intent#CATEGORY_APP_CALENDAR)Used with **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) to launch the calendar application.**String**

(/reference/java/lang/String)

CATEGORY_APP_CONTACTS (/reference/android/content/Intent#CATEGORY_APP_CONTACTS)Used with **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) to launch the contacts application.**String**

(/reference/java/lang/String)

CATEGORY_APP_EMAIL (/reference/android/content/Intent#CATEGORY_APP_EMAIL)Used with **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) to launch the email application.**String****CATEGORY_APP_FILES** (/reference/android/content/Intent#CATEGORY_APP_FILES)

<code>(/reference/java/lang/String)</code>	Used with <u>ACTION_MAIN</u> (<code>/reference/android/content/Intent#ACTION_MAIN</code>) to launch the files application.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_APP_GALLERY</u> (<code>/reference/android/content/Intent#CATEGORY_APP_GALLERY</code>) Used with <u>ACTION_MAIN</u> (<code>/reference/android/content/Intent#ACTION_MAIN</code>) to launch the gallery application.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_APP_MAPS</u> (<code>/reference/android/content/Intent#CATEGORY_APP_MAPS</code>) Used with <u>ACTION_MAIN</u> (<code>/reference/android/content/Intent#ACTION_MAIN</code>) to launch the maps application.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_APP_MARKET</u> (<code>/reference/android/content/Intent#CATEGORY_APP_MARKET</code>) This activity allows the user to browse and download new applications.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_APP_MESSAGING</u> (<code>/reference/android/content/Intent#CATEGORY_APP_MESSAGING</code>) Used with <u>ACTION_MAIN</u> (<code>/reference/android/content/Intent#ACTION_MAIN</code>) to launch the messaging application.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_APP_MUSIC</u> (<code>/reference/android/content/Intent#CATEGORY_APP_MUSIC</code>) Used with <u>ACTION_MAIN</u> (<code>/reference/android/content/Intent#ACTION_MAIN</code>) to launch the music application.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_BROWSABLE</u> (<code>/reference/android/content/Intent#CATEGORY_BROWSABLE</code>) Activities that can be safely invoked from a browser must support this category.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_CAR_DOCK</u> (<code>/reference/android/content/Intent#CATEGORY_CAR_DOCK</code>) An activity to run when device is inserted into a car dock.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_CAR_MODE</u> (<code>/reference/android/content/Intent#CATEGORY_CAR_MODE</code>) Used to indicate that the activity can be used in a car environment.
String <code>(/reference/java/lang/String)</code>	<u>CATEGORY_DEFAULT</u> (<code>/reference/android/content/Intent#CATEGORY_DEFAULT</code>) Set if the activity should be an option for the default action (center press) to perform on a piece of data.

String (/reference/java/lang/String)	<u>CATEGORY_DESK_DOCK</u> (/reference/android/content/Intent#CATEGORY_DESK_DOCK) An activity to run when device is inserted into a car dock.
String (/reference/java/lang/String)	<u>CATEGORY_DEVELOPMENT_PREFERENCE</u> (/reference/android/content/Intent#CATEGORY_DEVELOPMENT_PREFERENCE) This activity is a development preference panel.
String (/reference/java/lang/String)	<u>CATEGORY_EMBED</u> (/reference/android/content/Intent#CATEGORY_EMBED) Capable of running inside a parent activity container.
String (/reference/java/lang/String)	<u>CATEGORY_FRAMEWORK_INSTRUMENTATION_TEST</u> (/reference/android/content/Intent#CATEGORY_FRAMEWORK_INSTRUMENTATION_TEST) To be used as code under test for framework instrumentation tests.
String (/reference/java/lang/String)	<u>CATEGORY_HE_DESK_DOCK</u> (/reference/android/content/Intent#CATEGORY_HE_DESK_DOCK) An activity to run when device is inserted into a digital (high end) dock.
String (/reference/java/lang/String)	<u>CATEGORY_HOME</u> (/reference/android/content/Intent#CATEGORY_HOME) This is the home activity, that is the first activity that is displayed when the device boots.
String (/reference/java/lang/String)	<u>CATEGORY_INFO</u> (/reference/android/content/Intent#CATEGORY_INFO) Provides information about the package it is in; typically used if a package does not contain a <u>CATEGORY_LAUNCHER</u> (/reference/android/content/Intent#CATEGORY_LAUNCHER) to provide a front-door to the user without having to be shown in the all apps list.
String (/reference/java/lang/String)	<u>CATEGORY_LAUNCHER</u> (/reference/android/content/Intent#CATEGORY_LAUNCHER) Should be displayed in the top-level launcher.
String (/reference/java/lang/String)	<u>CATEGORY_LEANBACK_LAUNCHER</u> (/reference/android/content/Intent#CATEGORY_LEANBACK_LAUNCHER)

Indicates an activity optimized for Leanback mode, and that should be displayed in the Leanback launcher.

String (/reference/java/lang/String)	<u>CATEGORY_LE_DESK DOCK</u> (/reference/android/content/Intent#CATEGORY_LE_DESK DOCK) An activity to run when device is inserted into a analog (low end) dock.
String (/reference/java/lang/String)	<u>CATEGORY_MONKEY</u> (/reference/android/content/Intent#CATEGORY_MONKEY) This activity may be exercised by the monkey or other automated test tools.
String (/reference/java/lang/String)	<u>CATEGORY_OPENABLE</u> (/reference/android/content/Intent#CATEGORY_OPENABLE) Used to indicate that an intent only wants URIs that can be opened with <u>ContentResolver#openFileDescriptor(Uri, String)</u> (/reference/android/content/ContentResolver#openFileDescriptor(android.net.Uri,%20java.lang.String)).
String (/reference/java/lang/String)	<u>CATEGORY_PREFERENCE</u> (/reference/android/content/Intent#CATEGORY_PREFERENCE) This activity is a preference panel.
String (/reference/java/lang/String)	<u>CATEGORY_SAMPLE_CODE</u> (/reference/android/content/Intent#CATEGORY_SAMPLE_CODE) To be used as a sample code example (not part of the normal user experience).
String (/reference/java/lang/String)	<u>CATEGORY_SECONDARY_HOME</u> (/reference/android/content/Intent#CATEGORY_SECONDARY_HOME) The home activity shown on secondary displays that support showing home activities.
String (/reference/java/lang/String)	<u>CATEGORY_SELECTED_ALTERNATIVE</u> (/reference/android/content/Intent#CATEGORY_SELECTED_ALTERNATIVE) Set if the activity should be considered as an alternative selection action to the data the user has currently selected.
String (/reference/java/lang/String)	<u>CATEGORY_TAB</u> (/reference/android/content/Intent#CATEGORY_TAB) Intended to be used as a tab inside of a containing TabActivity.
String (/reference/java/lang/String)	<u>CATEGORY_TEST</u> (/reference/android/content/Intent#CATEGORY_TEST)

To be used as a test (not part of the normal user experience).

<p>String (/reference/java/lang/String)</p>	<p><u>CATEGORY_TYPED_OPENABLE</u> (/reference/android/content/Intent#CATEGORY_TYPED_OPENABLE)</p> <p>Used to indicate that an intent filter can accept files which are not necessarily openable by <u>ContentResolver#openFileDescriptor(Uri, String)</u> (/reference/android/content/ContentResolver#openFileDescriptor(android.net.Uri,%20java.lang.String)), but at least streamable via <u>ContentResolver#openTypedAssetFileDescriptor(Uri, String, Bundle)</u> (/reference/android/content/ContentResolver#openTypedAssetFileDescriptor(android.net.Uri,%20java.lang.String,%20android.os.Bundle)) using one of the stream types exposed via <u>ContentResolver#getStreamTypes(Uri, String)</u> (/reference/android/content/ContentResolver#getStreamTypes(android.net.Uri,%20java.lang.String)).</p>
<p>String (/reference/java/lang/String)</p>	<p><u>CATEGORY_UNIT_TEST</u> (/reference/android/content/Intent#CATEGORY_UNIT_TEST)</p> <p>To be used as a unit test (run through the Test Harness).</p>
<p>String (/reference/java/lang/String)</p>	<p><u>CATEGORY_VOICE</u> (/reference/android/content/Intent#CATEGORY_VOICE)</p> <p>Categories for activities that can participate in voice interaction.</p>
<p>String (/reference/java/lang/String)</p>	<p><u>CATEGORY_VR_HOME</u> (/reference/android/content/Intent#CATEGORY_VR_HOME)</p> <p>An activity to use for the launcher when the device is placed in a VR Headset viewer.</p>
<p>String (/reference/java/lang/String)</p>	<p><u>EXTRA_ALARM_COUNT</u> (/reference/android/content/Intent#EXTRA_ALARM_COUNT)</p> <p>Used as an int extra field in <u>AlarmManager</u> (/reference/android/app/AlarmManager) intents to tell the application being invoked how many pending alarms are being delivered with the intent.</p>
<p>String (/reference/java/lang/String)</p>	<p><u>EXTRA_ALLOW_MULTIPLE</u> (/reference/android/content/Intent#EXTRA_ALLOW_MULTIPLE)</p> <p>Extra used to indicate that an intent can allow the user to select and return multiple items.</p>
<p>String (/reference/java/lang/String)</p>	<p><u>EXTRA_ALLOW_REPLACE</u> (/reference/android/content/Intent#EXTRA_ALLOW_REPLACE)</p>

This constant was deprecated in API level 16. As of [Build.VERSION_CODES.JELLY_BEAN](#) (/reference/android/os/Build.VERSION_CODES#JELLY_BEAN), Android will no longer show an interstitial message about updating existing applications so this is no longer needed.

String (/reference/java/lang/String)	<u>EXTRA_ALTERNATE_INTENTS</u> (/reference/android/content/Intent#EXTRA_ALTERNATE_INTENTS) An Intent[] describing additional, alternate choices you would like shown with <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER).
String (/reference/java/lang/String)	<u>EXTRA_ASSIST_CONTEXT</u> (/reference/android/content/Intent#EXTRA_ASSIST_CONTEXT) An optional field on <u>ACTION_ASSIST</u> (/reference/android/content/Intent#ACTION_ASSIST) and containing additional contextual information supplied by the current foreground app at the time of the assist request.
String (/reference/java/lang/String)	<u>EXTRA_ASSIST_INPUT_DEVICE_ID</u> (/reference/android/content/Intent#EXTRA_ASSIST_INPUT_DEVICE_ID) An optional field on <u>ACTION_ASSIST</u> (/reference/android/content/Intent#ACTION_ASSIST) containing the InputDevice id that was used to invoke the assist.
String (/reference/java/lang/String)	<u>EXTRA_ASSIST_INPUT_HINT_KEYBOARD</u> (/reference/android/content/Intent#EXTRA_ASSIST_INPUT_HINT_KEYBOARD) An optional field on <u>ACTION_ASSIST</u> (/reference/android/content/Intent#ACTION_ASSIST) suggesting that the user will likely use a keyboard as the primary input device for assistance.
String (/reference/java/lang/String)	<u>EXTRA_ASSIST_PACKAGE</u> (/reference/android/content/Intent#EXTRA_ASSIST_PACKAGE) An optional field on <u>ACTION_ASSIST</u> (/reference/android/content/Intent#ACTION_ASSIST) containing the name of the current foreground application package at the time the assist was invoked.
String (/reference/java/lang/String)	<u>EXTRA_ASSIST_UID</u> (/reference/android/content/Intent#EXTRA_ASSIST_UID) An optional field on <u>ACTION_ASSIST</u> (/reference/android/content/Intent#ACTION_ASSIST) containing the uid of the current foreground application package at the time the assist was invoked.
String (/reference/java/lang/String)	<u>EXTRA_AUTO_LAUNCH_SINGLE_CHOICE</u> (/reference/android/content/Intent#EXTRA_AUTO_LAUNCH_SINGLE_CHOICE)

Used as a boolean extra field in [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER) intents to specify whether to show the chooser or not when there is only one application available to choose from.

String

(/reference/java/lang/String)

EXTRA_BCC (/reference/android/content/Intent#EXTRA_BCC)

A String[] holding e-mail addresses that should be blind carbon copied.

String

(/reference/java/lang/String)

EXTRA_BUG_REPORT (/reference/android/content/Intent#EXTRA_BUG_REPORT)Used as a parcelable extra field in [ACTION_APP_ERROR](#) (/reference/android/content/Intent#ACTION_APP_ERROR), containing the bug report.**String**

(/reference/java/lang/String)

EXTRA_CC (/reference/android/content/Intent#EXTRA_CC)

A String[] holding e-mail addresses that should be carbon copied.

String

(/reference/java/lang/String)

EXTRA_CHANGED_COMPONENT_NAME (/reference/android/content/Intent#EXTRA_CHANGED_COMPONENT_NAME)

This constant was deprecated in API level 15. See [EXTRA_CHANGED_COMPONENT_NAME_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_COMPONENT_NAME_LIST); this field will contain only the first name in the list.

String

(/reference/java/lang/String)

EXTRA_CHANGED_COMPONENT_NAME_LIST

(/reference/android/content/Intent#EXTRA_CHANGED_COMPONENT_NAME_LIST)

This field is part of [ACTION_PACKAGE_CHANGED](#) (/reference/android/content/Intent#ACTION_PACKAGE_CHANGED), and contains a string array of all of the components that have changed.

String

(/reference/java/lang/String)

EXTRA_CHANGED_PACKAGE_LIST (/reference/android/content/Intent#EXTRA_CHANGED_PACKAGE_LIST)

This field is part of [ACTION_EXTERNAL_APPLICATIONS_AVAILABLE](#) (/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_AVAILABLE), [ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE](#) (/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE), [ACTION_PACKAGES_SUSPENDED](#) (/reference/android/content/Intent#ACTION_PACKAGES_SUSPENDED), [ACTION_PACKAGES_UNSPENDED](#) (/reference/android/content/Intent#ACTION_PACKAGES_UNSPENDED) and contains a string array of all of the components that have changed.

<u>String</u> (/reference/java/lang/String)	<u>EXTRA_CHANGED_UID_LIST</u> (/reference/android/content/Intent#EXTRA_CHANGED_UID_LIST) This field is part of <u>ACTION_EXTERNAL_APPLICATIONS_AVAILABLE</u> (/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_AVAILABLE), <u>ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE</u> (/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE) and contains an integer array of uids of all of the components that have changed.
<u>String</u> (/reference/java/lang/String)	<u>EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER</u> (/reference/android/content/Intent#EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER) An <u>IntentSender</u> (/reference/android/content/IntentSender) for an Activity that will be invoked when the user makes a selection from the chooser activity presented by <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER).
<u>String</u> (/reference/java/lang/String)	<u>EXTRA_CHOOSER_TARGETS</u> (/reference/android/content/Intent#EXTRA_CHOOSER_TARGETS) A <u>ChooserTarget[]</u> (/reference/android/service/chooser/ChooserTarget) for <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER) describing additional high-priority deep-link targets for the chooser to present to the user.
<u>String</u> (/reference/java/lang/String)	<u>EXTRA_CHOSEN_COMPONENT</u> (/reference/android/content/Intent#EXTRA_CHOSEN_COMPONENT) The <u>ComponentName</u> (/reference/android/content/ComponentName) chosen by the user to complete an action.
<u>String</u> (/reference/java/lang/String)	<u>EXTRA_CHOSEN_COMPONENT_INTENT_SENDER</u> (/reference/android/content/Intent#EXTRA_CHOSEN_COMPONENT_INTENT_SENDER) An <u>IntentSender</u> (/reference/android/content/IntentSender) that will be notified if a user successfully chooses a target component to handle an action in an <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER) activity.
<u>String</u> (/reference/java/lang/String)	<u>EXTRA_COMPONENT_NAME</u> (/reference/android/content/Intent#EXTRA_COMPONENT_NAME) Intent extra: A <u>ComponentName</u> (/reference/android/content/ComponentName) value.
<u>String</u>	<u>EXTRA_CONTENT_ANNOTATIONS</u> (/reference/android/content/Intent#EXTRA_CONTENT_ANNOTATIONS)

(/reference/java/lang/String)	An ArrayList of String annotations describing content for <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER).
String (/reference/java/lang/String)	<u>EXTRA_CONTENT_QUERY</u> (/reference/android/content/Intent#EXTRA_CONTENT_QUERY) Optional CharSequence extra to provide a search query.
String (/reference/java/lang/String)	<u>EXTRA_DATA_REMOVED</u> (/reference/android/content/Intent#EXTRA_DATA_REMOVED) Used as a boolean extra field in <u>ACTION_PACKAGE_REMOVED</u> (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) intents to indicate whether this represents a full uninstall (removing both the code and its data) or a partial uninstall (leaving its data, implying that this is an update).
String (/reference/java/lang/String)	<u>EXTRA_DOCK_STATE</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE) Used as an int extra field in <u>ACTION_DOCK_EVENT</u> (/reference/android/content/Intent#ACTION_DOCK_EVENT) intents to request the dock state.
int	<u>EXTRA_DOCK_STATE_CAR</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE_CAR) Used as an int value for <u>EXTRA_DOCK_STATE</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is in a car dock.
int	<u>EXTRA_DOCK_STATE_DESK</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE_DESK) Used as an int value for <u>EXTRA_DOCK_STATE</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is in a desk dock.
int	<u>EXTRA_DOCK_STATE_HE_DESK</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE_HE_DESK) Used as an int value for <u>EXTRA_DOCK_STATE</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is in a digital (high end) dock.
int	<u>EXTRA_DOCK_STATE_LE_DESK</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE_LE_DESK) Used as an int value for <u>EXTRA_DOCK_STATE</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is in a analog (low end) dock.

int	<u>EXTRA_DOCK_STATE_UNDOCKED</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE_UNDOCKED) Used as an int value for <u>EXTRA_DOCK_STATE</u> (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is not in any dock.
String (/reference/java/lang/String)	<u>EXTRA_DONT_KILL_APP</u> (/reference/android/content/Intent#EXTRA_DONT_KILL_APP) Used as a boolean extra field in <u>ACTION_PACKAGE_REMOVED</u> (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) or <u>ACTION_PACKAGE_CHANGED</u> (/reference/android/content/Intent#ACTION_PACKAGE_CHANGED) intents to override the default action of restarting the application.
String (/reference/java/lang/String)	<u>EXTRA_DURATION_MILLIS</u> (/reference/android/content/Intent#EXTRA_DURATION_MILLIS) Intent extra: The number of milliseconds.
String (/reference/java/lang/String)	<u>EXTRA_EMAIL</u> (/reference/android/content/Intent#EXTRA_EMAIL) A String[] holding e-mail addresses that should be delivered to.
String (/reference/java/lang/String)	<u>EXTRA_EXCLUDE_COMPONENTS</u> (/reference/android/content/Intent#EXTRA_EXCLUDE_COMPONENTS) A ComponentName (/reference/android/content/ComponentName) describing components that should be filtered out and omitted from a list of components presented to the user.
String (/reference/java/lang/String)	<u>EXTRA_FROM_STORAGE</u> (/reference/android/content/Intent#EXTRA_FROM_STORAGE) Extra that can be included on activity intents coming from the storage UI when it launches sub-activities to manage various types of storage.
String (/reference/java/lang/String)	<u>EXTRA_HTML_TEXT</u> (/reference/android/content/Intent#EXTRA_HTML_TEXT) A constant String that is associated with the Intent, used with <u>ACTION_SEND</u> (/reference/android/content/Intent#ACTION_SEND) to supply an alternative to <u>EXTRA_TEXT</u> (/reference/android/content/Intent#EXTRA_TEXT) as HTML formatted text.
String	<u>EXTRA_INDEX</u> (/reference/android/content/Intent#EXTRA_INDEX)

(/reference/java/lang/String)	Optional index with semantics depending on the intent action.
String (/reference/java/lang/String)	<p><u>EXTRA_INITIAL_INTENTS</u> (/reference/android/content/Intent#EXTRA_INITIAL_INTENTS)</p> <p>A Parcelable[] of <u>Intent</u> (/reference/android/content/Intent) or <u>LabeledIntent</u> (/reference/android/content/pm/LabeledIntent) objects as set with <u>putExtra(java.lang.String, android.os.Parcelable[])</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Parcelable[])) of additional activities to place a the front of the list of choices, when shown to the user with a <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER).</p>
String (/reference/java/lang/String)	<p><u>EXTRA_INSTALLER_PACKAGE_NAME</u> (/reference/android/content/Intent#EXTRA_INSTALLER_PACKAGE_NAME)</p> <p>Used as a string extra field with <u>ACTION_INSTALL_PACKAGE</u> (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) to install a package.</p>
String (/reference/java/lang/String)	<p><u>EXTRA_INTENT</u> (/reference/android/content/Intent#EXTRA_INTENT)</p> <p>An Intent describing the choices you would like shown with <u>ACTION_PICK_ACTIVITY</u> (/reference/android/content/Intent#ACTION_PICK_ACTIVITY) or <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER).</p>
String (/reference/java/lang/String)	<p><u>EXTRA_KEY_EVENT</u> (/reference/android/content/Intent#EXTRA_KEY_EVENT)</p> <p>A <u>KeyEvent</u> (/reference/android/view/KeyEvent) object containing the event that triggered the creation of the Intent it is in.</p>
String (/reference/java/lang/String)	<p><u>EXTRA_LOCAL_ONLY</u> (/reference/android/content/Intent#EXTRA_LOCAL_ONLY)</p> <p>Extra used to indicate that an intent should only return data that is on the local device.</p>
String (/reference/java/lang/String)	<p><u>EXTRA_LOCUS_ID</u> (/reference/android/content/Intent#EXTRA_LOCUS_ID)</p> <p>Intent extra: ID of the context used on <u>ACTION_VIEW_LOCUS</u> (/reference/android/content/Intent#ACTION_VIEW_LOCUS).</p>
String	<u>EXTRA_MIME_TYPES</u> (/reference/android/content/Intent#EXTRA_MIME_TYPES)

(/reference/java/lang/String)	Extra used to communicate a set of acceptable MIME types.
String (/reference/java/lang/String)	<u>EXTRA_NOT_UNKNOWN_SOURCE</u> (/reference/android/content/Intent#EXTRA_NOT_UNKNOWN_SOURCE) Used as a boolean extra field with <u>ACTION_INSTALL_PACKAGE</u> (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) to install a package.
String (/reference/java/lang/String)	<u>EXTRA_ORIGINATING_URI</u> (/reference/android/content/Intent#EXTRA_ORIGINATING_URI) Used as a URI extra field with <u>ACTION_INSTALL_PACKAGE</u> (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) and <u>ACTION_VIEW</u> (/reference/android/content/Intent#ACTION_VIEW) to indicate the URI from which the local APK in the Intent data field originated from.
String (/reference/java/lang/String)	<u>EXTRA_PACKAGE_NAME</u> (/reference/android/content/Intent#EXTRA_PACKAGE_NAME) Intent extra: An app package name.
String (/reference/java/lang/String)	<u>EXTRA_PHONE_NUMBER</u> (/reference/android/content/Intent#EXTRA_PHONE_NUMBER) A String holding the phone number originally entered in <u>ACTION_NEW_OUTGOING_CALL</u> (/reference/android/content/Intent#ACTION_NEW_OUTGOING_CALL), or the actual number to call in a <u>ACTION_CALL</u> (/reference/android/content/Intent#ACTION_CALL).
String (/reference/java/lang/String)	<u>EXTRA_PROCESS_TEXT</u> (/reference/android/content/Intent#EXTRA_PROCESS_TEXT) The name of the extra used to define the text to be processed, as a CharSequence.
String (/reference/java/lang/String)	<u>EXTRA_PROCESS_TEXT_READONLY</u> (/reference/android/content/Intent#EXTRA_PROCESS_TEXT_READONLY) The name of the boolean extra used to define if the processed text will be used as read-only.
String (/reference/java/lang/String)	<u>EXTRA_QUICK_VIEW_FEATURES</u> (/reference/android/content/Intent#EXTRA_QUICK_VIEW_FEATURES) An optional extra of <code>String[]</code> indicating which quick view features should be made available to the user in the quick view UI while handing a <u>Intent#ACTION_QUICK_VIEW</u> (/reference/android/content/Intent#ACTION_QUICK_VIEW) intent.

String (/reference/java/lang/String)	<u>EXTRA_QUIET_MODE</u> (/reference/android/content/Intent#EXTRA_QUIET_MODE) Optional boolean extra indicating whether quiet mode has been switched on or off.
String (/reference/java/lang/String)	<u>EXTRA_REFERRER</u> (/reference/android/content/Intent#EXTRA_REFERRER) This extra can be used with any Intent used to launch an activity, supplying information about who is launching that activity.
String (/reference/java/lang/String)	<u>EXTRA_REFERRER_NAME</u> (/reference/android/content/Intent#EXTRA_REFERRER_NAME) Alternate version of <u>EXTRA_REFERRER</u> (/reference/android/content/Intent#EXTRA_REFERRER) that supplies the URI as a String rather than a <u>Uri</u> (/reference/android/net/Uri) object.
String (/reference/java/lang/String)	<u>EXTRA_REMOTE_INTENT_TOKEN</u> (/reference/android/content/Intent#EXTRA_REMOTE_INTENT_TOKEN) Used in the extra field in the remote intent.
String (/reference/java/lang/String)	<u>EXTRA_REPLACEMENT_EXTRAS</u> (/reference/android/content/Intent#EXTRA_REPLACEMENT_EXTRAS) A Bundle forming a mapping of potential target package names to different extras Bundles to add to the default intent extras in <u>EXTRA_INTENT</u> (/reference/android/content/Intent#EXTRA_INTENT) when used with <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER).
String (/reference/java/lang/String)	<u>EXTRA_REPLACING</u> (/reference/android/content/Intent#EXTRA_REPLACING) Used as a boolean extra field in <u>ACTION_PACKAGE_REMOVED</u> (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) intents to indicate that this is a replacement of the package, so this broadcast will immediately be followed by an add broadcast for a different version of the same package.
String (/reference/java/lang/String)	<u>EXTRA_RESTRICTIONS_BUNDLE</u> (/reference/android/content/Intent#EXTRA_RESTRICTIONS_BUNDLE) Extra sent in the intent to the BroadcastReceiver that handles <u>ACTION_GET_RESTRICTION_ENTRIES</u> (/reference/android/content/Intent#ACTION_GET_RESTRICTION_ENTRIES).
String	<u>EXTRA_RESTRICTIONS_INTENT</u> (/reference/android/content/Intent#EXTRA_RESTRICTIONS_INTENT)

(/reference/java/lang/String)	Extra used in the response from a BroadcastReceiver that handles <u>ACTION_GET_RESTRICTION_ENTRIES</u> (/reference/android/content/Intent#ACTION_GET_RESTRICTION_ENTRIES).
String (/reference/java/lang/String)	<u>EXTRA_RESTRICTIONS_LIST</u> (/reference/android/content/Intent#EXTRA_RESTRICTIONS_LIST) Extra used in the response from a BroadcastReceiver that handles <u>ACTION_GET_RESTRICTION_ENTRIES</u> (/reference/android/content/Intent#ACTION_GET_RESTRICTION_ENTRIES).
String (/reference/java/lang/String)	<u>EXTRA_RESULT_RECEIVER</u> (/reference/android/content/Intent#EXTRA_RESULT_RECEIVER) A <u>ResultReceiver</u> (/reference/android/os/ResultReceiver) used to return data back to the sender.
String (/reference/java/lang/String)	<u>EXTRA_RETURN_RESULT</u> (/reference/android/content/Intent#EXTRA_RETURN_RESULT) Used as a boolean extra field with <u>ACTION_INSTALL_PACKAGE</u> (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) or <u>ACTION_UNINSTALL_PACKAGE</u> (/reference/android/content/Intent#ACTION_UNINSTALL_PACKAGE).
String (/reference/java/lang/String)	<u>EXTRA_SHORTCUT_ICON</u> (/reference/android/content/Intent#EXTRA_SHORTCUT_ICON) <i>This constant was deprecated in API level 26. Replaced with <u>ShortcutManager.createShortcutResultIntent(ShortcutInfo)</u> (/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))</i>
String (/reference/java/lang/String)	<u>EXTRA_SHORTCUT_ICON_RESOURCE</u> (/reference/android/content/Intent#EXTRA_SHORTCUT_ICON_RESOURCE) <i>This constant was deprecated in API level 26. Replaced with <u>ShortcutManager.createShortcutResultIntent(ShortcutInfo)</u> (/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))</i>
String (/reference/java/lang/String)	<u>EXTRA_SHORTCUT_ID</u> (/reference/android/content/Intent#EXTRA_SHORTCUT_ID) Intent extra: ID of the shortcut used to send the share intent.
String (/reference/java/lang/String)	<u>EXTRA_SHORTCUT_INTENT</u> (/reference/android/content/Intent#EXTRA_SHORTCUT_INTENT)

This constant was deprecated in API level 26. Replaced with

[ShortcutManager.createShortcutResultIntent\(ShortcutInfo\)](#)

(/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))

String

(/reference/java/lang/String)

[EXTRA_SHORTCUT_NAME](#) (/reference/android/content/Intent#EXTRA_SHORTCUT_NAME)

This constant was deprecated in API level 26. Replaced with

[ShortcutManager.createShortcutResultIntent\(ShortcutInfo\)](#)

(/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))

String

(/reference/java/lang/String)

[EXTRA_SHUTDOWN_USERSPACE_ONLY](#) (/reference/android/content/Intent#EXTRA_SHUTDOWN_USERSPACE_ONLY)

Optional extra for **[ACTION_SHUTDOWN](#)** (/reference/android/content/Intent#ACTION_SHUTDOWN) that allows the sender to qualify that this shutdown is only for the user space of the system, not a complete shutdown.

String

(/reference/java/lang/String)

[EXTRA_SPLIT_NAME](#) (/reference/android/content/Intent#EXTRA_SPLIT_NAME)

Intent extra: An app split name.

String

(/reference/java/lang/String)

[EXTRA_STREAM](#) (/reference/android/content/Intent#EXTRA_STREAM)

A content: URI holding a stream of data associated with the Intent, used with **[ACTION_SEND](#)**

(/reference/android/content/Intent#ACTION_SEND) to supply the data being sent.

String

(/reference/java/lang/String)

[EXTRA_SUBJECT](#) (/reference/android/content/Intent#EXTRA_SUBJECT)

A constant string holding the desired subject line of a message.

String

(/reference/java/lang/String)

[EXTRA_SUSPENDED_PACKAGE_EXTRAS](#)

(/reference/android/content/Intent#EXTRA_SUSPENDED_PACKAGE_EXTRAS)

Intent extra: A **[Bundle](#)** (/reference/android/os/Bundle) of extras for a package being suspended.

String

(/reference/java/lang/String)

[EXTRA_TEMPLATE](#) (/reference/android/content/Intent#EXTRA_TEMPLATE)

The initial data to place in a newly created record.

String

[EXTRA_TEXT](#) (/reference/android/content/Intent#EXTRA_TEXT)

(/reference/java/lang/String)	A constant CharSequence that is associated with the Intent, used with <u>ACTION_SEND</u> (/reference/android/content/Intent#ACTION_SEND) to supply the literal data to be sent.
String (/reference/java/lang/String)	EXTRA_TIME (/reference/android/content/Intent#EXTRA_TIME) Optional extra specifying a time in milliseconds since the Epoch.
String (/reference/java/lang/String)	EXTRA_TITLE (/reference/android/content/Intent#EXTRA_TITLE) A CharSequence dialog title to provide to the user when used with a <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER).
String (/reference/java/lang/String)	EXTRA_UID (/reference/android/content/Intent#EXTRA_UID) Used as an int extra field in <u>ACTION_UID_REMOVED</u> (/reference/android/content/Intent#ACTION_UID_REMOVED) intents to supply the uid the package had been assigned.
String (/reference/java/lang/String)	EXTRA_USER (/reference/android/content/Intent#EXTRA_USER) The UserHandle carried with intents.
int	FILL_IN_ACTION (/reference/android/content/Intent#FILL_IN_ACTION) Use with fillIn(Intent, int) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current action value to be overwritten, even if it is already set.
int	FILL_IN_CATEGORIES (/reference/android/content/Intent#FILL_IN_CATEGORIES) Use with fillIn(Intent, int) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current categories to be overwritten, even if they are already set.
int	FILL_IN_CLIP_DATA (/reference/android/content/Intent#FILL_IN_CLIP_DATA) Use with fillIn(Intent, int) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current ClipData to be overwritten, even if it is already set.
int	FILL_IN_COMPONENT (/reference/android/content/Intent#FILL_IN_COMPONENT)

Use with `fillIn(Intent, int)` (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current component value to be overwritten, even if it is already set.

int **FILL_IN_DATA** (/reference/android/content/Intent#FILL_IN_DATA)

Use with `fillIn(Intent, int)` (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current data or type value overwritten, even if it is already set.

int **FILL_IN_IDENTIFIER** (/reference/android/content/Intent#FILL_IN_IDENTIFIER)

Use with `fillIn(Intent, int)` (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current identifier value to be overwritten, even if it is already set.

int **FILL_IN_PACKAGE** (/reference/android/content/Intent#FILL_IN_PACKAGE)

Use with `fillIn(Intent, int)` (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current package value to be overwritten, even if it is already set.

int **FILL_IN_SELECTOR** (/reference/android/content/Intent#FILL_IN_SELECTOR)

Use with `fillIn(Intent, int)` (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current selector to be overwritten, even if it is already set.

int **FILL_IN_SOURCE_BOUNDS** (/reference/android/content/Intent#FILL_IN_SOURCE_BOUNDS)

Use with `fillIn(Intent, int)` (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current bounds rectangle to be overwritten, even if it is already set.

int **FLAG_ACTIVITY_BROUGHT_TO_FRONT**
(/reference/android/content/Intent#FLAG_ACTIVITY_BROUGHT_TO_FRONT)

This flag is not normally set by application code, but set for you by the system as described in the [launchMode](#) (/reference/android/R.styleable#AndroidManifestActivity_launchMode) documentation for the singleTask mode.

int **FLAG_ACTIVITY_CLEAR_TASK** (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TASK)

If set in an Intent passed to **Context#startActivity**

(/reference/android/content/Context#startActivity(android.content.Intent)), this flag will cause any existing task that would be associated with the activity to be cleared before the activity is started.

int **FLAG_ACTIVITY_CLEAR_TOP** (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TOP)

If set, and the activity being launched is already running in the current task, then instead of launching a new instance of that activity, all of the other activities on top of it will be closed and this Intent will be delivered to the (now on top) old activity as a new Intent.

int **FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET**
(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET)

This constant was deprecated in API level 21. As of API 21 this performs identically to

FLAG_ACTIVITY_NEW_DOCUMENT (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT) *which should be used instead of this.*

int **FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS**
(/reference/android/content/Intent#FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS)

If set, the new activity is not kept in the list of recently launched activities.

int **FLAG_ACTIVITY_FORWARD_RESULT** (/reference/android/content/Intent#FLAG_ACTIVITY_FORWARD_RESULT)

If set and this intent is being used to launch a new activity from an existing one, then the reply target of the existing activity will be transferred to the new activity.

int **FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY**
(/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY)

This flag is not normally set by application code, but set for you by the system if this activity is being launched from history (longpress home key).

int **FLAG_ACTIVITY_LAUNCH_ADJACENT** (/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCH_ADJACENT)

This flag is only used in split-screen multi-window mode.

int	<u>FLAG_ACTIVITY_MATCH_EXTERNAL</u> (/reference/android/content/Intent#FLAG_ACTIVITY_MATCH_EXTERNAL) If set in an Intent passed to <u>Context#startActivity</u> (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will attempt to launch an instant app if no full app on the device can already handle the intent.
int	<u>FLAG_ACTIVITY_MULTIPLE_TASK</u> (/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK) This flag is used to create a new task and launch an activity into it.
int	<u>FLAG_ACTIVITY_NEW_DOCUMENT</u> (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT) This flag is used to open a document into a new task rooted at the activity launched by this Intent.
int	<u>FLAG_ACTIVITY_NEW_TASK</u> (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) If set, this activity will become the start of a new task on this history stack.
int	<u>FLAG_ACTIVITY_NO_ANIMATION</u> (/reference/android/content/Intent#FLAG_ACTIVITY_NO_ANIMATION) If set in an Intent passed to <u>Context#startActivity</u> (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will prevent the system from applying an activity transition animation to go to the next activity state.
int	<u>FLAG_ACTIVITY_NO_HISTORY</u> (/reference/android/content/Intent#FLAG_ACTIVITY_NO_HISTORY) If set, the new activity is not kept in the history stack.
int	<u>FLAG_ACTIVITY_NO_USER_ACTION</u> (/reference/android/content/Intent#FLAG_ACTIVITY_NO_USER_ACTION) If set, this flag will prevent the normal <u>Activity.onUserLeaveHint()</u> (/reference/android/app/Activity#onUserLeaveHint()) callback from occurring on the current frontmost activity before it is paused as the newly-started activity is brought to the front.
int	<u>FLAG_ACTIVITY_PREVIOUS_IS_TOP</u> (/reference/android/content/Intent#FLAG_ACTIVITY_PREVIOUS_IS_TOP) If set and this intent is being used to launch a new activity from an existing one, the current activity will not be counted as the top activity for deciding whether the new intent should be delivered to the top instead of starting a

new one.

int	<u>FLAG_ACTIVITY_REORDER_TO_FRONT</u> (/reference/android/content/Intent#FLAG_ACTIVITY_REORDER_TO_FRONT) If set in an Intent passed to <u>Context#startActivity</u> (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will cause the launched activity to be brought to the front of its task's history stack if it is already running.
int	<u>FLAG_ACTIVITY_RESET_TASK_IF_NEEDED</u> (/reference/android/content/Intent#FLAG_ACTIVITY_RESET_TASK_IF_NEEDED) If set, and this activity is either being started in a new task or bringing to the top an existing task, then it will be launched as the front door of the task.
int	<u>FLAG_ACTIVITY_RETAIN_IN_RECENTS</u> (/reference/android/content/Intent#FLAG_ACTIVITY_RETAIN_IN_RECENTS) By default a document created by <u>FLAG_ACTIVITY_NEW_DOCUMENT</u> (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT) will have its entry in recent tasks removed when the user closes it (with back or however else it may finish()).
int	<u>FLAG_ACTIVITY_SINGLE_TOP</u> (/reference/android/content/Intent#FLAG_ACTIVITY_SINGLE_TOP) If set, the activity will not be launched if it is already running at the top of the history stack.
int	<u>FLAG_ACTIVITY_TASK_ON_HOME</u> (/reference/android/content/Intent#FLAG_ACTIVITY_TASK_ON_HOME) If set in an Intent passed to <u>Context#startActivity</u> (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will cause a newly launching task to be placed on top of the current home activity task (if there is one).
int	<u>FLAG_DEBUG_LOG_RESOLUTION</u> (/reference/android/content/Intent#FLAG_DEBUG_LOG_RESOLUTION) A flag you can enable for debugging: when set, log messages will be printed during the resolution of this intent to show you what has been found to create the final resolved list.
int	<u>FLAG_DIRECT_BOOT_AUTO</u> (/reference/android/content/Intent#FLAG_DIRECT_BOOT_AUTO)

Flag used to automatically match intents based on their Direct Boot awareness and the current user state.

int **FLAG_EXCLUDE_STOPPED_PACKAGES** (/reference/android/content/Intent#FLAG_EXCLUDE_STOPPED_PACKAGES)

If set, this intent will not match any components in packages that are currently stopped.

int **FLAG_FROM_BACKGROUND** (/reference/android/content/Intent#FLAG_FROM_BACKGROUND)

Can be set by the caller to indicate that this Intent is coming from a background operation, not from direct user interaction.

int **FLAG_GRANT_PERSISTABLE_URI_PERMISSION**
(/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION)

When combined with **FLAG_GRANT_READ_URI_PERMISSION**
(/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) and/or
FLAG_GRANT_WRITE_URI_PERMISSION
(/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), the URI permission grant can be persisted across device reboots until explicitly revoked with **Context#revokeUriPermission(Uri, int)**
([/reference/android/content/Context#revokeUriPermission\(android.net.Uri,%20int\)](/reference/android/content/Context#revokeUriPermission(android.net.Uri,%20int))).

int **FLAG_GRANT_PREFIX_URI_PERMISSION**
(/reference/android/content/Intent#FLAG_GRANT_PREFIX_URI_PERMISSION)

When combined with **FLAG_GRANT_READ_URI_PERMISSION**
(/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) and/or
FLAG_GRANT_WRITE_URI_PERMISSION
(/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), the URI permission grant applies to any URI that is a prefix match against the original granted URI.

int **FLAG_GRANT_READ_URI_PERMISSION**
(/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION)

If set, the recipient of this Intent will be granted permission to perform read operations on the URI in the Intent's data and any URIs specified in its ClipData.

int **FLAG_GRANT_WRITE_URI_PERMISSION**

(/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION)

If set, the recipient of this Intent will be granted permission to perform write operations on the URI in the Intent's data and any URIs specified in its ClipData.

int **FLAG_INCLUDE_STOPPED_PACKAGES** (/reference/android/content/Intent#FLAG_INCLUDE_STOPPED_PACKAGES)

If set, this intent will always match any components in packages that are currently stopped.

int **FLAG_RECEIVER_FOREGROUND** (/reference/android/content/Intent#FLAG_RECEIVER_FOREGROUND)

If set, when sending a broadcast the recipient is allowed to run at foreground priority, with a shorter timeout interval.

int **FLAG_RECEIVER_NO_ABORT** (/reference/android/content/Intent#FLAG_RECEIVER_NO_ABORT)

If this is an ordered broadcast, don't allow receivers to abort the broadcast.

int **FLAG_RECEIVER_REGISTERED_ONLY** (/reference/android/content/Intent#FLAG_RECEIVER_REGISTERED_ONLY)

If set, when sending a broadcast only registered receivers will be called -- no BroadcastReceiver components will be launched.

int **FLAG_RECEIVER_REPLACE_PENDING** (/reference/android/content/Intent#FLAG_RECEIVER_REPLACE_PENDING)

If set, when sending a broadcast the new broadcast will replace any existing pending broadcast that matches it.

int **FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS**
(/reference/android/content/Intent#FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS)

If set, the broadcast will be visible to receivers in Instant Apps.

String
(/reference/java/lang/String) **METADATA_DOCK_HOME** (/reference/android/content/Intent#METADATA_DOCK_HOME)

Boolean that can be supplied as meta-data with a dock activity, to indicate that the dock should take over the home key when it is active.

int **URI_ALLOW_UNSAFE** (/reference/android/content/Intent#URI_ALLOW_UNSAFE)

Flag for use with `toUri(int)` (/reference/android/content/Intent#toUri(int)) and `parseUri(String, int)` (/reference/android/content/Intent#parseUri(java.lang.String,%20int)): allow parsing of unsafe information.

int **URI_ANDROID_APP_SCHEME** (/reference/android/content/Intent#URI_ANDROID_APP_SCHEME)

Flag for use with `toUri(int)` (/reference/android/content/Intent#toUri(int)) and `parseUri(String, int)` (/reference/android/content/Intent#parseUri(java.lang.String,%20int)): the URI string always has the "android-app:" scheme.

int **URI_INTENT_SCHEME** (/reference/android/content/Intent#URI_INTENT_SCHEME)

Flag for use with `toUri(int)` (/reference/android/content/Intent#toUri(int)) and `parseUri(String, int)` (/reference/android/content/Intent#parseUri(java.lang.String,%20int)): the URI string always has the "intent:" scheme.

Inherited constants

From interface [android.os.Parcelable](#) (/reference/android/os/Parcelable)

int **CONTENTS_FILE_DESCRIPTOR** (/reference/android/os/Parcelable#CONTENTS_FILE_DESCRIPTOR)

Descriptor bit used with `describeContents()` (/reference/android/os/Parcelable#describeContents()): indicates that the Parcelable object's flattened representation includes a file descriptor.

int **PARCELABLE_WRITE_RETURN_VALUE** (/reference/android/os/Parcelable#PARCELABLE_WRITE_RETURN_VALUE)

Flag for use with `writeToParcel(Parcel, int)` (/reference/android/os/Parcelable#writeToParcel(android.os.Parcel,%20int)): the object being written is a return value, that is the result of a function such as "`Parcelable someFunction()`", "`void someFunction(out Parcelable)`", or "`void someFunction(inout Parcelable)`".

Fields

public static final **CREATOR** (/reference/android/content/Intent#CREATOR)

Creator

(/reference/android/os/Parcelabl
e.Creator)

<Intent

(/reference/android/content/Inte
nt)
>

Public constructors

Intent (/reference/android/content/Intent#Intent()) ()

Create an empty intent.

Intent (/reference/android/content/Intent#Intent(android.content.Intent)) (**Intent** (/reference/android/content/Intent) o)

Copy constructor.

Intent (/reference/android/content/Intent#Intent(java.lang.String)) (**String** (/reference/java/lang/String) action)

Create an intent with a given action.

Intent (/reference/android/content/Intent#Intent(java.lang.String,%20android.net.Uri)) (**String** (/reference/java/lang/String) action, **Uri** (/reference/android/net/Uri) uri)

Create an intent with a given action and for a given data url.

Intent (/reference/android/content/Intent#Intent(android.content.Context,%20java.lang.Class<?>)) (**Context** (/reference/android/content/Context) packageContext, **Class** (/reference/java/lang/Class)<?> cls)

Create an intent for a specific component.

Intent (/reference/android/content/Intent#Intent(java.lang.String,%20android.net.Uri,%20android.content.Context,%20java.lang.Class<?>)) (**String** (/reference/java/lang/String) action, **Uri** (/reference/android/net/Uri) uri, **Context** (/reference/android/content/Context) packageContext, **Class** (/reference/java/lang/Class)<?> cls)

Create an intent for a specific component with a specified action and data.

Public methods

<u>Intent</u> (/reference/android/content/Intent)	<u>addCategory</u> (/reference/android/content/Intent#addCategory(java.lang.String))(<u>String</u> (/reference/java/lang/String) category)	Add a new category to the intent.
<u>Intent</u> (/reference/android/content/Intent)	<u>addFlags</u> (/reference/android/content/Intent#addFlags(int))(int flags)	Add additional flags to the intent (or with existing flags value).
<u>Object</u> (/reference/java/lang/Object)	<u>clone</u> (/reference/android/content/Intent#clone())()	Creates and returns a copy of this object.
<u>Intent</u> (/reference/android/content/Intent)	<u>cloneFilter</u> (/reference/android/content/Intent#cloneFilter())()	Make a clone of only the parts of the Intent that are relevant for filter matching: the action, data, type, component, and categories.
static <u>Intent</u> (/reference/android/content/Intent)	<u>createChooser</u> (/reference/android/content/Intent#createChooser(android.content.Intent,%20java.lang.CharSequence,%20android.content.IntentSender)) (<u>Intent</u> (/reference/android/content/Intent) target , <u>CharSequence</u> (/reference/java/lang/CharSequence) title , <u>IntentSender</u> (/reference/android/content/IntentSender) sender)	Convenience function for creating a <u>ACTION_CHOOSER</u> (/reference/android/content/Intent#ACTION_CHOOSER) Intent.
static <u>Intent</u> (/reference/android/content/Intent)	<u>createChooser</u> (/reference/android/content/Intent#createChooser(android.content.Intent,%20java.lang.CharSequence))(<u>Intent</u> (/reference/android/content/Intent) target , <u>CharSequence</u> (/reference/java/lang/CharSequence) title)	

Convenience function for creating a **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER) Intent.

int **describeContents** ([/reference/android/content/Intent#describeContents\(\)](/reference/android/content/Intent#describeContents()))()

Describe the kinds of special objects contained in this Parcelable instance's marshaled representation.

int **fillIn** ([/reference/android/content/Intent#fillIn\(android.content.Intent,%20int\)](/reference/android/content/Intent#fillIn(android.content.Intent,%20int))) (**Intent** (</reference/android/content/Intent>) **other**, **int flags**)

Copy the contents of **other** in to this object, but only where fields are not defined by this object.

boolean **filterEquals** ([/reference/android/content/Intent#filterEquals\(android.content.Intent\)](/reference/android/content/Intent#filterEquals(android.content.Intent))) (**Intent** (</reference/android/content/Intent>) **other**)

Determine if two intents are the same for the purposes of intent resolution (filtering).

int **filterHashCode** ([/reference/android/content/Intent#filterHashCode\(\)](/reference/android/content/Intent#filterHashCode()))()

Generate hash code that matches semantics of filterEquals().

String (</reference/java/lang/String>) **getAction** ([/reference/android/content/Intent#getAction\(\)](/reference/android/content/Intent#getAction()))()

Retrieve the general action to be performed, such as **ACTION_VIEW** (/reference/android/content/Intent#ACTION_VIEW).

boolean[] **getBooleanArrayExtra** ([/reference/android/content/Intent#getBooleanArrayExtra\(java.lang.String\)](/reference/android/content/Intent#getBooleanArrayExtra(java.lang.String))) (**String** (</reference/java/lang/String>) **name**)

Retrieve extended data from the intent.

boolean **getBooleanExtra** ([/reference/android/content/Intent#getBooleanExtra\(java.lang.String,%20boolean\)](/reference/android/content/Intent#getBooleanExtra(java.lang.String,%20boolean))) (**String** (</reference/java/lang/String>) **name**, **boolean defaultValue**)

Retrieve extended data from the intent.

Bundle (</reference/android/os/Bundle>) **getBundleExtra** ([/reference/android/content/Intent#getBundleExtra\(java.lang.String\)](/reference/android/content/Intent#getBundleExtra(java.lang.String))) (**String** (</reference/java/lang/String>) **name**)

Retrieve extended data from the intent.

byte[] **getByteArrayExtra** (/reference/android/content/Intent#getByteArrayExtra(java.lang.String)) (**String**
(/reference/java/lang/String) **name**)

Retrieve extended data from the intent.

byte **getBytesExtra** (/reference/android/content/Intent#getBytesExtra(java.lang.String,%20byte)) (**String**
(/reference/java/lang/String) **name**, **byte defaultValue**)

Retrieve extended data from the intent.

Set (/reference/java/util/Set) **getCategories** (/reference/android/content/Intent#getCategories()) ()
<String
(/reference/java/lang/String)> Return the set of all categories in the intent.

char[] **getCharArrayExtra** (/reference/android/content/Intent#getCharArrayExtra(java.lang.String)) (**String**
(/reference/java/lang/String) **name**)

Retrieve extended data from the intent.

char **getCharExtra** (/reference/android/content/Intent#getCharExtra(java.lang.String,%20char)) (**String**
(/reference/java/lang/String) **name**, **char defaultValue**)

Retrieve extended data from the intent.

CharSequence[] **getCharSequenceArrayExtra** (/reference/android/content/Intent#getCharSequenceArrayExtra(java.lang.String))
(/reference/java/lang/CharSeque **(String** (/reference/java/lang/String) **name**)
nce)

Retrieve extended data from the intent.

ArrayList **getCharSequenceArrayListExtra**
(/reference/java/util/ArrayList) (/reference/android/content/Intent#getCharSequenceArrayListExtra(java.lang.String)) (**String**
<CharSequence
(/reference/java/lang/CharSeque **(String**
nce)

Retrieve extended data from the intent.

>

<u>CharSequence</u> (/reference/java/lang/CharSequence)	<u>getCharSequenceExtra</u> (/reference/android/content/Intent#getCharSequenceExtra(java.lang.String)) (<u>String</u> name) Retrieve extended data from the intent.
<u>ClipData</u> (/reference/android/content/ClipData)	<u>getClipData</u> (/reference/android/content/Intent#getClipData()) () Return the <u>ClipData</u> (/reference/android/content/ClipData) associated with this Intent.
<u>ComponentName</u> (/reference/android/content/ComponentName)	<u>getComponent</u> (/reference/android/content/Intent#getComponent()) () Retrieve the concrete component associated with the intent.
<u>Uri</u> (/reference/android/net/Uri)	<u>getData</u> (/reference/android/content/Intent#getData()) () Retrieve data this intent is operating on.
<u>String</u> (/reference/java/lang/String)	<u>getDataString</u> (/reference/android/content/Intent#getDataString()) () The same as <u>getData</u> (.) (/reference/android/content/Intent#getData()), but returns the URI as an encoded String.
<u>double[]</u>	<u>getDoubleArrayExtra</u> (/reference/android/content/Intent#getDoubleArrayExtra(java.lang.String)) (<u>String</u> name) Retrieve extended data from the intent.
<u>double</u>	<u>getDoubleExtra</u> (/reference/android/content/Intent#getDoubleExtra(java.lang.String,%20double)) (<u>String</u> name, <u>double</u> defaultValue) Retrieve extended data from the intent.
<u>Bundle</u> (/reference/android/os/Bundle)	<u>getExtras</u> (/reference/android/content/Intent#getExtras()) () Retrieves a map of extended data from the intent.
<u>int</u>	<u>getFlags</u> (/reference/android/content/Intent#getFlags()) ()

Retrieve any special flags associated with this intent.

float[] **getFloatArrayExtra** (/reference/android/content/Intent#getFloatArrayExtra(java.lang.String)) (**String** (/reference/java/lang/String) **name**)

Retrieve extended data from the intent.

float **getFloatExtra** (/reference/android/content/Intent#getFloatExtra(java.lang.String,%20float)) (**String** (/reference/java/lang/String) **name**, **float defaultValue**)

Retrieve extended data from the intent.

String (/reference/java/lang/String) **getIdentifier** (/reference/android/content/Intent#getIdentifier()) ()

Retrieve the identifier for this Intent.

int[] **getIntArrayExtra** (/reference/android/content/Intent#getIntArrayExtra(java.lang.String)) (**String** (/reference/java/lang/String) **name**)

Retrieve extended data from the intent.

int **getIntExtra** (/reference/android/content/Intent#getIntExtra(java.lang.String,%20int)) (**String** (/reference/java/lang/String) **name**, **int defaultValue**)

Retrieve extended data from the intent.

ArrayList (/reference/java/util/ArrayList) **getIntegerArrayListExtra** (/reference/android/content/Intent#getIntegerArrayListExtra(java.lang.String)) (**String** (/reference/java/lang/String) **name**)

<Integer> (/reference/java/lang/Integer)> Retrieve extended data from the intent.

static Intent (/reference/android/content/Intent) **getIntent** (/reference/android/content/Intent#getIntent(java.lang.String)) (**String** (/reference/java/lang/String) **uri**)

*This method was deprecated in API level 15. Use **parseUri(String, int)** (/reference/android/content/Intent#parseUri(java.lang.String,%20int)) instead.*

static Intent (/reference/android/content/Intent)	getIntentOld (/reference/android/content/Intent#getIntentOld(java.lang.String)) (String uri)
long[]	getLongArrayExtra (/reference/android/content/Intent#getLongArrayExtra(java.lang.String)) (String name) Retrieve extended data from the intent.
long	getLongExtra (/reference/android/content/Intent#getLongExtra(java.lang.String,%20long)) (String name, long defaultValue) Retrieve extended data from the intent.
String (/reference/java/lang/String)	getPackage (/reference/android/content/Intent#getPackage()) () Retrieve the application package name this Intent is limited to.
Parcelable[] (/reference/android/os/Parcelable)	getParcelableArrayExtra (/reference/android/content/Intent#getParcelableArrayExtra(java.lang.String)) (String name) Retrieve extended data from the intent.
<T extends Parcelable (/reference/android/os/Parcelable) > ArrayList (/reference/java/util/ArrayList) <T>	getParcelableArrayListExtra (/reference/android/content/Intent#getParcelableArrayListExtra(java.lang.String)) (String name) Retrieve extended data from the intent.
<T extends Parcelable (/reference/android/os/Parcelable) > T	getParcelableExtra (/reference/android/content/Intent#getParcelableExtra(java.lang.String)) (String name) Retrieve extended data from the intent.
String (/reference/java/lang/String)	getScheme (/reference/android/content/Intent#getScheme()) ()

Return the scheme portion of the intent's data.

Intent (/reference/android/content/Intent)	getSelector (/reference/android/content/Intent#getSelector()) () Return the specific selector associated with this Intent.
Serializable (/reference/java/io/Serializable)	getSerializableExtra (/reference/android/content/Intent#getSerializableExtra(java.lang.String)) (String (/reference/java/lang/String) name) Retrieve extended data from the intent.
short[]	getShortArrayExtra (/reference/android/content/Intent#getShortArrayExtra(java.lang.String)) (String (/reference/java/lang/String) name) Retrieve extended data from the intent.
short	getShortExtra (/reference/android/content/Intent#getShortExtra(java.lang.String,%20short)) (String (/reference/java/lang/String) name , short defaultValue) Retrieve extended data from the intent.
Rect (/reference/android/graphics/Rect)	getSourceBounds (/reference/android/content/Intent#getSourceBounds()) () Get the bounds of the sender of this intent, in screen coordinates.
String[] (/reference/java/lang/String)	getStringArrayExtra (/reference/android/content/Intent#getStringArrayExtra(java.lang.String)) (String (/reference/java/lang/String) name) Retrieve extended data from the intent.
ArrayList (/reference/java/util/ArrayList) < String (/reference/java/lang/String)>	getStringArrayListExtra (/reference/android/content/Intent#getStringArrayListExtra(java.lang.String)) (String (/reference/java/lang/String) name) Retrieve extended data from the intent.
String (/reference/java/lang/String)	getStringExtra (/reference/android/content/Intent#getStringExtra(java.lang.String)) (String (/reference/java/lang/String) name)

Retrieve extended data from the intent.

String ([/reference/java/lang/String](#)) **getType** ([/reference/android/content/Intent#getType\(\)](#))()

Retrieve any explicit MIME type included in the intent.

boolean **hasCategory** ([/reference/android/content/Intent#hasCategory\(java.lang.String\)](#)) (**String** ([/reference/java/lang/String](#)) **category**)

Check if a category exists in the intent.

boolean **hasExtra** ([/reference/android/content/Intent#hasExtra\(java.lang.String\)](#)) (**String** ([/reference/java/lang/String](#)) **name**)

Returns true if an extra value is associated with the given name.

boolean **hasFileDescriptors** ([/reference/android/content/Intent#hasFileDescriptors\(\)](#))()

Returns true if the Intent's extras contain a parcelled file descriptor.

static Intent ([/reference/android/content/Intent](#)) **makeMainActivity** ([/reference/android/content/Intent#makeMainActivity\(android.content.ComponentName\)](#)) (**ComponentName** ([/reference/android/content/ComponentName](#)) **mainActivity**)

Create an intent to launch the main (root) activity of a task.

static Intent ([/reference/android/content/Intent](#)) **makeMainSelectorActivity** ([/reference/android/content/Intent#makeMainSelectorActivity\(java.lang.String,%20java.lang.String\)](#)) (**String** ([/reference/java/lang/String](#)) **selectorAction**, **String** ([/reference/java/lang/String](#)) **selectorCategory**)

Make an Intent for the main activity of an application, without specifying a specific activity to run but giving a selector to find the activity.

static Intent ([/reference/android/content/Intent](#)) **makeRestartActivityTask** ([/reference/android/content/Intent#makeRestartActivityTask\(android.content.ComponentName\)](#)) (**ComponentName** ([/reference/android/content/ComponentName](#)) **mainActivity**)

Make an Intent that can be used to re-launch an application's task in its base state.

static String **normalizeMimeType** (/reference/android/content/Intent#normalizeMimeType(java.lang.String)) (**String** (/reference/java/lang/String) **type**)

Normalize a MIME data type.

static Intent **parseIntent** (/reference/android/content/Intent#parseIntent(android.content.res.Resources,%20org.xmlpull.v1.XmlPullParser,%20android.util.AttributeSet))
 (**Resources** (/reference/android/content/res/Resources) **resources**, **XmlPullParser** (/reference/org/xmlpull/v1/XmlPullParser) **parser**, **AttributeSet** (/reference/android/util/AttributeSet) **attrs**)

Parses the "intent" element (and its children) from XML and instantiates an Intent object.

static Intent **parseUri** (/reference/android/content/Intent#parseUri(java.lang.String,%20int)) (**String** (/reference/android/content/Intent) **uri**, **int flags**)

Create an intent from a URI.

Intent **putCharSequenceArrayListExtra** (/reference/android/content/Intent#putCharSequenceArrayListExtra(java.lang.String,%20java.util.ArrayList<java.lang.CharSequence>))
 (**String** (/reference/java/lang/String) **name**, **ArrayList** (/reference/java/util/ArrayList) **<CharSequence** (/reference/java/lang/CharSequence) **> value**)

Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Parcelable)) (**String** (/reference/android/content/Intent) **name**, **Parcelable** (/reference/android/os/Parcelable) **value**)

Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20long[])) (**String** (/reference/android/content/Intent) **name**, **long[] value**)

Add extended data to the intent.

<u>Intent</u> (/reference/android/content/Intent)	<u>putExtra</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20byte)) (<u>String</u> (/reference/java/lang/String) name , byte value)
	Add extended data to the intent.
<u>Intent</u> (/reference/android/content/Intent)	<u>putExtra</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20double[])) (<u>String</u> (/reference/java/lang/String) name , double[] value)
	Add extended data to the intent.
<u>Intent</u> (/reference/android/content/Intent)	<u>putExtra</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20java.lang.CharSequence)) (<u>String</u> (/reference/java/lang/String) name , <u>CharSequence</u> (/reference/java/lang/CharSequence) value)
	Add extended data to the intent.
<u>Intent</u> (/reference/android/content/Intent)	<u>putExtra</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20boolean[])) (<u>String</u> (/reference/java/lang/String) name , boolean[] value)
	Add extended data to the intent.
<u>Intent</u> (/reference/android/content/Intent)	<u>putExtra</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20int)) (<u>String</u> (/reference/java/lang/String) name , int value)
	Add extended data to the intent.
<u>Intent</u> (/reference/android/content/Intent)	<u>putExtra</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20char[])) (<u>String</u> (/reference/java/lang/String) name , char[] value)
	Add extended data to the intent.
<u>Intent</u> (/reference/android/content/Intent)	<u>putExtra</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20byte[])) (<u>String</u> (/reference/java/lang/String) name , byte[] value)
	Add extended data to the intent.
<u>Intent</u> (/reference/android/content/Intent)	<u>putExtra</u> (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Parcelable[])) (<u>String</u> (/reference/java/lang/String) name , <u>Parcelable[]</u> (/reference/android/os/Parcelable) value)

(/reference/android/content/Intent) Add extended data to the intent.

Intent ([/reference/android/content/Intent](#)) **putExtra** ([/reference/android/content/Intent#putExtra\(java.lang.String,%20android.os.Bundle\)](#)) ([String](#) ([/reference/android/content/Intent](#)) ([/reference/java/lang/String](#)) **name**, [Bundle](#) ([/reference/android/os/Bundle](#)) **value**)

Add extended data to the intent.

Intent ([/reference/android/content/Intent](#)) **putExtra** ([/reference/android/content/Intent#putExtra\(java.lang.String,%20java.lang.CharSequence\[\]\)](#)) ([String](#) ([/reference/android/content/Intent](#)) ([/reference/java/lang/String](#)) **name**, [CharSequence\[\]](#) ([/reference/java/lang/CharSequence](#)) **value**)

Add extended data to the intent.

Intent ([/reference/android/content/Intent](#)) **putExtra** ([/reference/android/content/Intent#putExtra\(java.lang.String,%20float\[\]\)](#)) ([String](#) ([/reference/android/content/Intent](#)) ([/reference/java/lang/String](#)) **name**, [float\[\]](#) **value**)

Add extended data to the intent.

Intent ([/reference/android/content/Intent](#)) **putExtra** ([/reference/android/content/Intent#putExtra\(java.lang.String,%20double\)](#)) ([String](#) ([/reference/android/content/Intent](#)) ([/reference/java/lang/String](#)) **name**, [double](#) **value**)

Add extended data to the intent.

Intent ([/reference/android/content/Intent](#)) **putExtra** ([/reference/android/content/Intent#putExtra\(java.lang.String,%20int\[\]\)](#)) ([String](#) ([/reference/android/content/Intent](#)) ([/reference/java/lang/String](#)) **name**, [int\[\]](#) **value**)

Add extended data to the intent.

Intent ([/reference/android/content/Intent](#)) **putExtra** ([/reference/android/content/Intent#putExtra\(java.lang.String,%20java.lang.String\[\]\)](#)) ([String](#) ([/reference/android/content/Intent](#)) ([/reference/java/lang/String](#)) **name**, [String\[\]](#) ([/reference/java/lang/String](#)) **value**)

Add extended data to the intent.

Intent ([/reference/android/content/Intent](#)) **putExtra** ([/reference/android/content/Intent#putExtra\(java.lang.String,%20short\[\]\)](#)) ([String](#) ([/reference/android/content/Intent](#)) ([/reference/java/lang/String](#)) **name**, [short\[\]](#) **value**)

Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20boolean)) (**String** (/reference/android/content/Intent) **name**, **boolean value**)
nt)
Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20java.lang.String)) (**String** (/reference/android/content/Intent) **name**, **String** (/reference/java/lang/String) **value**)
nt)
Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20long)) (**String** (/reference/android/content/Intent) **name**, **long value**)
nt)
Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20char)) (**String** (/reference/android/content/Intent) **name**, **char value**)
nt)
Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20java.io.Serializable)) (**String** (/reference/android/content/Intent) **name**, **Serializable** (/reference/java/io/Serializable) **value**)
nt)
Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20float)) (**String** (/reference/android/content/Intent) **name**, **float value**)
nt)
Add extended data to the intent.

Intent **putExtra** (/reference/android/content/Intent#putExtra(java.lang.String,%20short)) (**String** (/reference/android/content/Intent) **name**, **short value**)
nt)
Add extended data to the intent.

Intent **putExtras** (/reference/android/content/Intent#putExtras(android.content.Intent)) (**Intent** (/reference/android/content/Intent) **src**)

(/reference/android/content/Intent) Copy all extras in 'src' in to this intent.
 (/reference/android/content/Intent)

Intent **putExtras** (/reference/android/content/Intent#putExtras(android.os.Bundle)) (**Bundle**
 (/reference/android/content/Intent) (/reference/android/os/Bundle) **extras**)
 (/reference/android/content/Intent)

Add a set of extended data to the intent.

Intent **putIntegerArrayListExtra**
 (/reference/android/content/Intent) (/reference/android/content/Intent#putIntegerArrayListExtra(java.lang.String,%20java.util.ArrayList<java.lang.Integer
 (/reference/android/content/Intent))
 (/reference/java/lang/String) **name**, **ArrayList** (/reference/java/util/ArrayList)<**Integer**
 (/reference/java/lang/Integer)> **value**)

Add extended data to the intent.

Intent **putParcelableArrayListExtra**
 (/reference/android/content/Intent) (/reference/android/content/Intent#putParcelableArrayListExtra(java.lang.String,%20java.util.ArrayList<?
 (/reference/android/content/Intent))
 (/reference/java/lang/String) **name**, **ArrayList** (/reference/java/util/ArrayList)
 <? **extends Parcelable** (/reference/android/os/Parcelable)> **value**)

Add extended data to the intent.

Intent **putStringArrayListExtra**
 (/reference/android/content/Intent) (/reference/android/content/Intent#putStringArrayListExtra(java.lang.String,%20java.util.ArrayList<java.lang.String>
 (/reference/android/content/Intent))
 (/reference/java/lang/String) **name**, **ArrayList** (/reference/java/util/ArrayList)<**String**
 (/reference/java/lang/String)> **value**)

Add extended data to the intent.

void **readFromParcel** (/reference/android/content/Intent#readFromParcel(android.os.Parcel)) (**Parcel**
 (/reference/android/os/Parcel) **in**)

void **removeCategory** (/reference/android/content/Intent#removeCategory(java.lang.String)) (**String**
 (/reference/java/lang/String) **category**)

Remove a category from an intent.

void [removeExtra](#) (/reference/android/content/Intent#removeExtra(java.lang.String)) (**String** (/reference/java/lang/String) **name**)

Remove extended data from the intent.

void [removeFlags](#) (/reference/android/content/Intent#removeFlags(int)) (**int** **flags**)

Remove these flags from the intent.

Intent ([Intent](#) (/reference/android/content/Intent)) [replaceExtras](#) (/reference/android/content/Intent#replaceExtras(android.content.Intent)) (**Intent** (/reference/android/content/Intent) **src**)

Completely replace the extras in the Intent with the extras in the given Intent.

Intent ([Intent](#) (/reference/android/content/Intent)) [replaceExtras](#) (/reference/android/content/Intent#replaceExtras(android.os.Bundle)) (**Bundle** (/reference/android/os/Bundle) **extras**)

Completely replace the extras in the Intent with the given Bundle of extras.

ComponentName ([ComponentName](#) (/reference/android/content/ComponentName)) [resolveActivity](#) (/reference/android/content/Intent#resolveActivity(android.content.pm.PackageManager)) (**PackageManager** (/reference/android/content/pm/PackageManager) **pm**)

Return the Activity component that should be used to handle this intent.

ActivityInfo ([ActivityInfo](#) (/reference/android/content/pm/ActivityInfo)) [resolveActivityInfo](#) (/reference/android/content/Intent#resolveActivityInfo(android.content.pm.PackageManager,%20int)) (**PackageManager** (/reference/android/content/pm/PackageManager) **pm**, **int** **flags**)

Resolve the Intent into an **ActivityInfo** (/reference/android/content/pm/ActivityInfo) describing the activity that should execute the intent.

String ([String](#) (/reference/java/lang/String)) [resolveType](#) (/reference/android/content/Intent#resolveType(android.content.Context)) (**Context** (/reference/android/content/Context) **context**)

Return the MIME data type of this intent.

| | |
|--|---|
| String
(/reference/java/lang/String) | resolveType (/reference/android/content/Intent#resolveType(android.content.ContentResolver))
(ContentResolver (/reference/android/content/ContentResolver) resolver) |
| | Return the MIME data type of this intent. |
| String
(/reference/java/lang/String) | resolveTypeIfNeeded
(/reference/android/content/Intent#resolveTypeIfNeeded(android.content.ContentResolver))(ContentResolver
(/reference/android/content/ContentResolver) resolver) |
| | Return the MIME data type of this intent, only if it will be needed for intent resolution. |
| Intent
(/reference/android/content/Intent) | setAction (/reference/android/content/Intent#setAction(java.lang.String))(String (/reference/java/lang/String) action) |
| | Set the general action to be performed. |
| Intent
(/reference/android/content/Intent) | setClass (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>))(Context
(/reference/android/content/Context) packageContext , Class (/reference/java/lang/Class)<?> cls) |
| | Convenience for calling setComponent(android.content.ComponentName) .
(/reference/android/content/Intent#setComponent(android.content.ComponentName)) with the name returned by a Class (/reference/java/lang/Class) object. |
| Intent
(/reference/android/content/Intent) | setClassName (/reference/android/content/Intent#setClassName(java.lang.String,%20java.lang.String))(String
(/reference/java/lang/String) packageName , String (/reference/java/lang/String) className) |
| | Convenience for calling setComponent(ComponentName) .
(/reference/android/content/Intent#setComponent(android.content.ComponentName)) with an explicit application package name and class name. |
| Intent
(/reference/android/content/Intent) | setClassName (/reference/android/content/Intent#setClassName(android.content.Context,%20java.lang.String))(Context (/reference/android/content/Context) packageContext , String (/reference/java/lang/String) className) |
| | Convenience for calling setComponent(ComponentName) .
(/reference/android/content/Intent#setComponent(android.content.ComponentName)) with an explicit class name. |

void	<u>setClipData</u> (/reference/android/content/Intent#setClipData(android.content.ClipData)) (<u>ClipData</u> (/reference/android/content/ClipData) clip)
	Set a <u>ClipData</u> (/reference/android/content/ClipData) associated with this Intent.
Intent (/reference/android/content/Intent)	<u>setComponent</u> (/reference/android/content/Intent#setComponent(android.content.ComponentName)) (<u>ComponentName</u> (/reference/android/content/ComponentName) component)
	(Usually optional) Explicitly set the component to handle the intent.
Intent (/reference/android/content/Intent)	<u>setData</u> (/reference/android/content/Intent#setData(android.net.Uri)) (<u>Uri</u> (/reference/android/net/Uri) data)
	Set the data this intent is operating on.
Intent (/reference/android/content/Intent)	<u>setDataAndNormalize</u> (/reference/android/content/Intent#setDataAndNormalize(android.net.Uri)) (<u>Uri</u> (/reference/android/net/Uri) data)
	Normalize and set the data this intent is operating on.
Intent (/reference/android/content/Intent)	<u>setDataAndType</u> (/reference/android/content/Intent#setDataAndType(android.net.Uri,%20java.lang.String)) (<u>Uri</u> (/reference/android/net/Uri) data , <u>String</u> (/reference/java/lang/String) type)
	(Usually optional) Set the data for the intent along with an explicit MIME data type.
Intent (/reference/android/content/Intent)	<u>setDataAndTypeAndNormalize</u> (/reference/android/content/Intent#setDataAndTypeAndNormalize(android.net.Uri,%20java.lang.String)) (<u>Uri</u> (/reference/android/net/Uri) data , <u>String</u> (/reference/java/lang/String) type)
	(Usually optional) Normalize and set both the data Uri and an explicit MIME data type.
void	<u>setExtrasClassLoader</u> (/reference/android/content/Intent#setExtrasClassLoader(java.lang.ClassLoader)) (<u>ClassLoader</u> (/reference/java/lang/ClassLoader) loader)
	Sets the ClassLoader that will be used when unmarshalling any Parcelable values from the extras of this Intent.
Intent	<u>setFlags</u> (/reference/android/content/Intent#setFlags(int)) (int flags)

([/reference/android/content/Intent](#)) Set special flags controlling how this intent is handled.

Intent ([/reference/android/content/Intent](#)) **setIdentifier** ([/reference/android/content/Intent#setIdentifier\(java.lang.String\)](#)) (**String** ([/reference/java/lang/String](#)) **identifier**)

Set an identifier for this Intent.

Intent ([/reference/android/content/Intent](#)) **setPackage** ([/reference/android/content/Intent#setPackage\(java.lang.String\)](#)) (**String** ([/reference/java/lang/String](#)) **packageName**)

(Usually optional) Set an explicit application package name that limits the components this Intent will resolve to.

void ([/reference/android/content/Intent](#)) **setSelector** ([/reference/android/content/Intent#setSelector\(android.content.Intent\)](#)) (**Intent** ([/reference/android/content/Intent](#)) **selector**)

Set a selector for this Intent.

void ([/reference/android/content/Intent](#)) **setSourceBounds** ([/reference/android/content/Intent#setSourceBounds\(android.graphics.Rect\)](#)) (**Rect** ([/reference/android/graphics/Rect](#)) **r**)

Set the bounds of the sender of this intent, in screen coordinates.

Intent ([/reference/android/content/Intent](#)) **setType** ([/reference/android/content/Intent#setType\(java.lang.String\)](#)) (**String** ([/reference/java/lang/String](#)) **type**)

Set an explicit MIME data type.

Intent ([/reference/android/content/Intent](#)) **setTypeAndNormalize** ([/reference/android/content/Intent#setTypeAndNormalize\(java.lang.String\)](#)) (**String** ([/reference/java/lang/String](#)) **type**)

Normalize and set an explicit MIME data type.

String ([/reference/java/lang/String](#)) **toString** ([/reference/android/content/Intent#toString\(\)](#)) ()

Returns a string representation of the object.

String ([/reference/android/content/Intent#toURI\(\)](#)) ()

(/reference/java/lang/String) *This method was deprecated in API level 15. Use [toUri\(int\)](#) (/reference/android/content/Intent#toUri(int)) instead.*

String [toUri](#) (/reference/android/content/Intent#toUri(int))(int flags)

(/reference/java/lang/String)

Convert this Intent into a String holding a URI representation of it.

void [writeToParcel](#) (/reference/android/content/Intent#writeToParcel(android.os.Parcel,%20int))(Parcel

(/reference/android/os/Parcel) out, int flags)

Flatten this object in to a Parcel.

Inherited methods

From class [java.lang.Object](#) (/reference/java/lang/Object)

Object (/reference/java/lang/Object) [clone](#) (/reference/java/lang/Object#clone())()

Creates and returns a copy of this object.

boolean [equals](#) (/reference/java/lang/Object#equals(java.lang.Object))(Object

(/reference/java/lang/Object) obj)

Indicates whether some other object is "equal to" this one.

void [finalize](#) (/reference/java/lang/Object#finalize())()

Called by the garbage collector on an object when garbage collection determines that there are no more references to the object.

final Class (/reference/java/lang/Class)<?>[getClass](#) (/reference/java/lang/Object#getClass())()

Returns the runtime class of this **Object**.

int [hashCode](#) (/reference/java/lang/Object#hashCode())()

Returns a hash code value for the object.

final void	<u>notify</u> (/reference/java/lang/Object#notify()) () Wakes up a single thread that is waiting on this object's monitor.
final void	<u>notifyAll</u> (/reference/java/lang/Object#notifyAll()) () Wakes up all threads that are waiting on this object's monitor.
<u>String</u> (/reference/java/lang/String)	<u>toString</u> (/reference/java/lang/Object#toString()) () Returns a string representation of the object.
final void	<u>wait</u> (/reference/java/lang/Object#wait(long,%20int))(long timeout, int nanos) Causes the current thread to wait until another thread invokes the <u>notify</u> (.) (/reference/java/lang/Object#notify()) method or the <u>notifyAll</u> (.) (/reference/java/lang/Object#notifyAll()) method for this object, or some other thread interrupts the current thread, or a certain amount of real time has elapsed.
final void	<u>wait</u> (/reference/java/lang/Object#wait(long))(long timeout) Causes the current thread to wait until either another thread invokes the <u>notify</u> (.) (/reference/java/lang/Object#notify()) method or the <u>notifyAll</u> (.) (/reference/java/lang/Object#notifyAll()) method for this object, or a specified amount of time has elapsed.
final void	<u>wait</u> (/reference/java/lang/Object#wait()) () Causes the current thread to wait until another thread invokes the <u>notify</u> (.) (/reference/java/lang/Object#notify()) method or the <u>notifyAll</u> (.) (/reference/java/lang/Object#notifyAll()) method for this object.
From interface <u>android.os.Parcelable</u> (/reference/android/os/Parcelable)	
abstract int	<u>describeContents</u> (/reference/android/os/Parcelable#describeContents()) () Describe the kinds of special objects contained in this Parcelable instance's marshaled representation.

abstract void

writeToParcel ([\(/reference/android/os/Parcelable#writeToParcel\(android.os.Parcel,%20int\)\)](/reference/android/os/Parcelable#writeToParcel(android.os.Parcel,%20int))) (**Parcel** [\(/reference/android/os/Parcel\)](/reference/android/os/Parcel) **dest**, **int flags**)

Flatten this object in to a Parcel.

Constants

ACTION_AIRPLANE_MODE_CHANGED

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String ACTION_AIRPLANE_MODE_CHANGED
```

Broadcast Action: The user has switched the phone into or out of Airplane Mode. One or more radios have been turned off or on. The intent will have the following extra value:

- *state* - A boolean value indicating whether Airplane Mode is on. If true, then cell radio and possibly other radios such as bluetooth or WiFi may have also been turned off

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.AIRPLANE_MODE"

ACTION_ALL_APPS

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String (/reference/java/lang/String) ACTION_ALL_APPS
```

Activity Action: List all available applications.

Input: Nothing.

Output: nothing.

Constant Value: "android.intent.action.ALL_APPS"

ACTION_ANSWER

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_ANSWER
```

Activity Action: Handle an incoming phone call.

Input: nothing.

Output: nothing.

Constant Value: "android.intent.action.ANSWER"

ACTION_APPLICATION_PREFERENCES

Added in [API level 24](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_APPLICATION_PREFERENCES
```

An activity that provides a user interface for adjusting application preferences. Optional but recommended settings for all applications which have settings.

Constant Value: "android.intent.action.APPLICATION_PREFERENCES"

ACTION_APPLICATION_RESTRICTIONS_CHANGED Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_APPLICATION_RESTRICTIONS_CHANGED
```

Broadcast Action: Sent after application restrictions are changed.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.APPLICATION_RESTRICTIONS_CHANGED"

ACTION_APP_ERROR Added in [API level 14](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_APP_ERROR
```

Activity Action: The user pressed the "Report" button in the crash/ANR dialog. This intent is delivered to the package which installed the application, usually Google Play.

Input: No data is specified. The bug report is passed in using an [EXTRA_BUG_REPORT](#) (/reference/android/content/Intent#EXTRA_BUG_REPORT) field.

Output: Nothing.

See also:

[EXTRA_BUG_REPORT](/reference/android/content/Intent#EXTRA_BUG_REPORT) (/reference/android/content/Intent#EXTRA_BUG_REPORT)

Constant Value: "android.intent.action.APP_ERROR"

ACTION_ASSIST

Added in [API level 16](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String ACTION_ASSIST
```

Activity Action: Perform assist action.

Input: [EXTRA_ASSIST_PACKAGE](/reference/android/content/Intent#EXTRA_ASSIST_PACKAGE) (/reference/android/content/Intent#EXTRA_ASSIST_PACKAGE), [EXTRA_ASSIST_CONTEXT](/reference/android/content/Intent#EXTRA_ASSIST_CONTEXT) (/reference/android/content/Intent#EXTRA_ASSIST_CONTEXT), can provide additional optional contextual information about where the user was when they requested the assist; [EXTRA_REFERRER](/reference/android/content/Intent#EXTRA_REFERRER) (/reference/android/content/Intent#EXTRA_REFERRER) may be set with additional referrer information. Output: nothing.

Constant Value: "android.intent.action.ASSIST"

ACTION_ATTACH_DATA

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String ACTION_ATTACH_DATA
```

Used to indicate that some piece of data should be attached to some other place. For example, image data could be attached to a contact. It is up to the recipient to decide where the data should be attached; the intent does not specify the ultimate destination.

Input: `getData()` (/reference/android/content/Intent#getData()) is URI of data to be attached.

Output: nothing.

Constant Value: "android.intent.action.ATTACH_DATA"

ACTION_BATTERY_CHANGED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_BATTERY_CHANGED
```

Broadcast Action: This is a *sticky broadcast* containing the charging state, level, and other information about the battery. See [BatteryManager](#) (/reference/android/os/BatteryManager) for documentation on the contents of the Intent.

You *cannot* receive this through components declared in manifests, only by explicitly registering for it with

[Context#registerReceiver\(BroadcastReceiver, IntentFilter\)](#).

(/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)). See [ACTION_BATTERY_LOW](#) (/reference/android/content/Intent#ACTION_BATTERY_LOW), [ACTION_BATTERY_OKAY](#) (/reference/android/content/Intent#ACTION_BATTERY_OKAY), [ACTION_POWER_CONNECTED](#) (/reference/android/content/Intent#ACTION_POWER_CONNECTED), and [ACTION_POWER_DISCONNECTED](#) (/reference/android/content/Intent#ACTION_POWER_DISCONNECTED) for distinct battery-related broadcasts that are sent and can be received through manifest receivers.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.BATTERY_CHANGED"

ACTION_BATTERY_LOW

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_BATTERY_LOW
```

Broadcast Action: Indicates low battery condition on the device. This broadcast corresponds to the "Low battery warning" system dialog.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.BATTERY_LOW"

ACTION_BATTERY_OKAY

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_BATTERY_OKAY
```

Broadcast Action: Indicates the battery is now okay after being low. This will be sent after [ACTION_BATTERY_LOW](#) (/reference/android/content/Intent#ACTION_BATTERY_LOW) once the battery has gone back up to an okay state.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.BATTERY_OKAY"

ACTION_BOOT_COMPLETED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_BOOT_COMPLETED
```

Broadcast Action: This is broadcast once, after the user has finished booting. It can be used to perform application-specific initialization, such as installing alarms. You must hold the [Manifest.permission.RECEIVE_BOOT_COMPLETED](#) (/reference/android/Manifest.permission#RECEIVE_BOOT_COMPLETED) permission in order to receive this broadcast.

This broadcast is sent at boot by all devices (both with and without direct boot support). Upon receipt of this broadcast, the user is unlocked and both device-protected and credential-protected storage can be accessed safely.

If you need to run while the user is still locked (before they've entered their lock pattern or PIN for the first time), you can listen for the [ACTION_LOCKED_BOOT_COMPLETED](#) (/reference/android/content/Intent#ACTION_LOCKED_BOOT_COMPLETED) broadcast.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.BOOT_COMPLETED"

ACTION_BUG_REPORT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_BUG_REPORT
```

Activity Action: Show activity for reporting a bug.

Input: Nothing.

Output: Nothing.

Constant Value: "android.intent.action.BUG_REPORT"

ACTION_CALL

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_CALL
```

Activity Action: Perform a call to someone specified by the data.

Input: If nothing, an empty dialer is started; else [getData\(\)](#) (/reference/android/content/Intent#getData()) is URI of a phone number to be dialed or a tel: URI of an explicit phone number.

Output: nothing.

Note: there will be restrictions on which applications can initiate a call; most applications should use the [ACTION_DIAL](#) (/reference/android/content/Intent#ACTION_DIAL).

Note: this Intent **cannot** be used to call emergency numbers. Applications can **dial** emergency numbers using [ACTION_DIAL](#) (/reference/android/content/Intent#ACTION_DIAL), however.

Note: if you app targets [M](#) (/reference/android/os/Build.VERSION_CODES#M) and above and declares as using the [Manifest.permission.CALL_PHONE](#) (/reference/android/Manifest.permission#CALL_PHONE) permission which is not granted, then attempting to use this action will result in a [SecurityException](#) (/reference/java/lang/SecurityException).

Constant Value: "android.intent.action.CALL"

ACTION_CALL_BUTTON

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)


```
public static final String (/reference/java/lang/String) ACTION_CALL_BUTTON
```

Activity Action: The user pressed the "call" button to go to the dialer or other appropriate UI for placing a call.

Input: Nothing.

Output: Nothing.

Constant Value: "android.intent.action.CALL_BUTTON"

ACTION_CAMERA_BUTTON

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_CAMERA_BUTTON
```

Broadcast Action: The "Camera Button" was pressed. Includes a single extra field, [EXTRA_KEY_EVENT](#) (/reference/android/content/Intent#EXTRA_KEY_EVENT), containing the key event that caused the broadcast.

Constant Value: "android.intent.action.CAMERA_BUTTON"

ACTION_CARRIER_SETUP

Added in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_CARRIER_SETUP
```

Activity Action: Main entry point for carrier setup apps.

Carrier apps that provide an implementation for this action may be invoked to configure carrier service and typically require carrier privileges ([/reference/android/telephony/TelephonyManager#hasCarrierPrivileges\(\)](/reference/android/telephony/TelephonyManager#hasCarrierPrivileges())) to fulfill their duties.

Constant Value: "android.intent.action.CARRIER_SETUP"

ACTION_CHOOSER

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String ACTION_CHOOSER
```

Activity Action: Display an activity chooser, allowing the user to pick what they want to before proceeding. This can be used as an alternative to the standard activity picker that is displayed by the system when you try to start an activity with multiple possible matches, with these differences in behavior:

- You can specify the title that will appear in the activity chooser.
- The user does not have the option to make one of the matching activities a preferred activity, and all possible activities will always be shown even if one of them is currently marked as the preferred activity.

This action should be used when the user will naturally expect to select an activity in order to proceed. An example of when not to use it is when the user clicks on a "mailto:" link. They would naturally expect to go directly to their mail app, so `startActivity()` should be called directly: it will either launch the current preferred app, or put up a dialog allowing the user to pick an app to use and optionally marking that as preferred.

In contrast, if the user is selecting a menu item to send a picture they are viewing to someone else, there are many different things they may want to do at this point: send it through e-mail, upload it to a web service, etc. In this case the CHOOSER action should be used, to always present to the user a list of the things they can do, with a nice title given by the caller such as "Send this photo with:".

If you need to grant URI permissions through a chooser, you must specify the permissions to be granted on the ACTION_CHOOSER Intent *in addition* to the EXTRA_INTENT inside. This means using `setClipData(ClipData)`.

(/reference/android/content/Intent#setClipData(android.content.ClipData)) to specify the URIs to be granted as well as **FLAG_GRANT_READ_URI_PERMISSION** (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) and/or **FLAG_GRANT_WRITE_URI_PERMISSION** (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION) as appropriate.

As a convenience, an Intent of this form can be created with the **createChooser(Intent, CharSequence)** (/reference/android/content/Intent#createChooser(android.content.Intent,%20java.lang.CharSequence)) function.

Input: No data should be specified. get*Extra must have a **EXTRA_INTENT** (/reference/android/content/Intent#EXTRA_INTENT) field containing the Intent being executed, and can optionally have a **EXTRA_TITLE** (/reference/android/content/Intent#EXTRA_TITLE) field containing the title text to display in the chooser.

Output: Depends on the protocol of **EXTRA_INTENT** (/reference/android/content/Intent#EXTRA_INTENT).

Constant Value: "android.intent.action.CHOOSER"

ACTION_CLOSE_SYSTEM_DIALOGS

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_CLOSE_SYSTEM_DIALOGS
```

Broadcast Action: This is broadcast when a user action should request a temporary system dialog to dismiss. Some examples of temporary system dialogs are the notification window-shade and the recent tasks dialog.

Constant Value: "android.intent.action.CLOSE_SYSTEM_DIALOGS"

ACTION_CONFIGURATION_CHANGED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_CONFIGURATION_CHANGED
```

Broadcast Action: The current device [Configuration](#) (/reference/android/content/res/Configuration) (orientation, locale, etc) has changed. When such a change happens, the UIs (view hierarchy) will need to be rebuilt based on this new information; for the most part, applications don't need to worry about this, because the system will take care of stopping and restarting the application to make sure it sees the new changes. Some system code that can not be restarted will need to watch for this action and handle it appropriately.

You *cannot* receive this through components declared in manifests, only by explicitly registering for it with

[Context#registerReceiver\(BroadcastReceiver, IntentFilter\)](#).

(/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)).

This is a protected intent that can only be sent by the system.

See also:

[Configuration](#) (/reference/android/content/res/Configuration)

Constant Value: "android.intent.action.CONFIGURATION_CHANGED"

ACTION_CREATE_DOCUMENT

Added in [API level 19](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_CREATE_DOCUMENT
```

Activity Action: Allow the user to create a new document. When invoked, the system will display the various [DocumentsProvider](#) (/reference/android/provider/DocumentsProvider) instances installed on the device, letting the user navigate through them. The returned

document may be a newly created document with no content, or it may be an existing document with the requested MIME type.

Each document is represented as a `content://` URI backed by a `DocumentsProvider` (/reference/android/provider/DocumentsProvider), which can be opened as a stream with `ContentResolver#openFileDescriptor(Uri, String)`.

(/reference/android/content/ContentResolver#openFileDescriptor(android.net.Uri,%20java.lang.String)), or queried for `DocumentsContract.Document` (/reference/android/provider/DocumentsContract.Document) metadata.

Callers must indicate the concrete MIME type of the document being created by setting `setType(java.lang.String)` (/reference/android/content/Intent#setType(java.lang.String)). This MIME type cannot be changed after the document is created.

Callers can provide an initial display name through `EXTRA_TITLE` (/reference/android/content/Intent#EXTRA_TITLE), but the user may change this value before creating the file.

Callers must include `CATEGORY_OPENABLE` (/reference/android/content/Intent#CATEGORY_OPENABLE) in the Intent to obtain URIs that can be opened with `ContentResolver#openFileDescriptor(Uri, String)`.

(/reference/android/content/ContentResolver#openFileDescriptor(android.net.Uri,%20java.lang.String)).

Callers can set a document URI through `DocumentsContract#EXTRA_INITIAL_URI`

(/reference/android/provider/DocumentsContract#EXTRA_INITIAL_URI) to indicate the initial location of documents navigator. System will do its best to launch the navigator in the specified document if it's a folder, or the folder that contains the specified document if not.

Output: The URI of the item that was created. This must be a `content://` URI so that any receiver can access it.

See also:

`DocumentsContract` (/reference/android/provider/DocumentsContract)

`ACTION_OPEN_DOCUMENT` (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT)

`ACTION_OPEN_DOCUMENT_TREE` (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT_TREE)

`FLAG_GRANT_PERSISTABLE_URI_PERMISSION` (/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION)

Constant Value: "android.intent.action.CREATE_DOCUMENT"

ACTION_CREATE_REMINDER

Added in Android R (/preview)

```
public static final String (/reference/java/lang/String) ACTION_CREATE_REMINDER
```

Activity Action: Creates a reminder.

Input: **EXTRA_TITLE** (/reference/android/content/Intent#EXTRA_TITLE) The title of the reminder that will be shown to the user. **EXTRA_TEXT** (/reference/android/content/Intent#EXTRA_TEXT) The reminder text that will be shown to the user. The intent should at least specify a title or a text. **EXTRA_TIME** (/reference/android/content/Intent#EXTRA_TIME) The time when the reminder will be shown to the user. The time is specified in milliseconds since the Epoch (optional).

Output: Nothing.

See also:

EXTRA_TITLE (/reference/android/content/Intent#EXTRA_TITLE)

EXTRA_TEXT (/reference/android/content/Intent#EXTRA_TEXT)

EXTRA_TIME (/reference/android/content/Intent#EXTRA_TIME)

Constant Value: "android.intent.action.CREATE_REMINDER"

ACTION_CREATE_SHORTCUT

Added in API level 1 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_CREATE_SHORTCUT
```

Activity Action: Creates a shortcut.

Input: Nothing.

Output: An Intent representing the ShortcutInfo (/reference/android/content/pm/ShortcutInfo) result.

For compatibility with older versions of android the intent may also contain three extras: SHORTCUT_INTENT (value: Intent), SHORTCUT_NAME (value: String), and SHORTCUT_ICON (value: Bitmap) or SHORTCUT_ICON_RESOURCE (value: ShortcutIconResource).

See also:

ShortcutManager.createShortcutResultIntent(ShortcutInfo)

(/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))

EXTRA_SHORTCUT_INTENT (/reference/android/content/Intent#EXTRA_SHORTCUT_INTENT)

EXTRA_SHORTCUT_NAME (/reference/android/content/Intent#EXTRA_SHORTCUT_NAME)

EXTRA_SHORTCUT_ICON (/reference/android/content/Intent#EXTRA_SHORTCUT_ICON)

EXTRA_SHORTCUT_ICON_RESOURCE (/reference/android/content/Intent#EXTRA_SHORTCUT_ICON_RESOURCE)

Intent.ShortcutIconResource (/reference/android/content/Intent.ShortcutIconResource)

Constant Value: "android.intent.action.CREATE_SHORTCUT"

ACTION_DATE_CHANGED

Added in API level 1 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_DATE_CHANGED
```

Broadcast Action: The date has changed.

Constant Value: "android.intent.action.DATE_CHANGED"

ACTION_DEFAULT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_DEFAULT
```

A synonym for [ACTION_VIEW](#) (/reference/android/content/Intent#ACTION_VIEW), the "standard" action that is performed on a piece of data.

Constant Value: "android.intent.action.VIEW"

ACTION_DEFINE

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_DEFINE
```

Activity Action: Define the meaning of the selected word(s).

Input: [getCharSequence\(EXTRA_TEXT\)](#) (/reference/android/content/Intent#EXTRA_TEXT) is the text to define.

Output: nothing.

Constant Value: "android.intent.action.DEFINE"

ACTION_DELETE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_DELETE
```

Activity Action: Delete the given data from its container.

Input: [getData\(\)](#) (/reference/android/content/Intent#getData()) is URI of data to be deleted.

Output: nothing.

Constant Value: "android.intent.action.DELETE"

ACTION_DEVICE_STORAGE_LOW

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_DEVICE_STORAGE_LOW
```

This constant was deprecated in API level 26.

if your app targets [Build.VERSION_CODES.O](#) (/reference/android/os/Build.VERSION_CODES#O) or above, this broadcast will no longer be delivered to any [BroadcastReceiver](#) (/reference/android/content/BroadcastReceiver) defined in your manifest. Instead, apps are strongly encouraged to use the improved [Context#getCacheDir\(\)](#) (/reference/android/content/Context#getCacheDir()) behavior so the system can automatically free up storage when needed.

Broadcast Action: A sticky broadcast that indicates low storage space condition on the device

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.DEVICE_STORAGE_LOW"

ACTION_DEVICE_STORAGE_OK

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_DEVICE_STORAGE_OK
```

This constant was deprecated in API level 26.

if your app targets [Build.VERSION_CODES.O](#) (/reference/android/os/Build.VERSION_CODES#O) or above, this broadcast will no longer be delivered to any [BroadcastReceiver](#) (/reference/android/content/BroadcastReceiver) defined in your manifest. Instead, apps are strongly encouraged to use the improved [Context#getCacheDir\(\)](#) (/reference/android/content/Context#getCacheDir()) behavior so the system can automatically free up storage when needed.

Broadcast Action: Indicates low storage space condition on the device no longer exists

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.DEVICE_STORAGE_OK"

ACTION_DIAL

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_DIAL
```

Activity Action: Dial a number as specified by the data. This shows a UI with the number being dialed, allowing the user to explicitly initiate the call.

Input: If nothing, an empty dialer is started; else `getData()` ([/reference/android/content/Intent#getData\(\)](/reference/android/content/Intent#getData())) is URI of a phone number to be dialed or a tel: URI of an explicit phone number.

Output: nothing.

Constant Value: "android.intent.action.DIAL"

ACTION_DOCK_EVENT

Added in [API level 5](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String ACTION_DOCK_EVENT
```

Broadcast Action: A sticky broadcast for changes in the physical docking state of the device.

The intent will have the following extra values:

- [EXTRA_DOCK_STATE](/reference/android/content/Intent#EXTRA_DOCK_STATE) (/reference/android/content/Intent#EXTRA_DOCK_STATE) - the current dock state, indicating which dock the device is physically in.

This is intended for monitoring the current physical dock state. See [UiModeManager](/reference/android/app/UiModeManager) (</reference/android/app/UiModeManager>) for the normal API dealing with dock mode changes.

Constant Value: "android.intent.action.DOCK_EVENT"

ACTION_DREAMING_STARTED

Added in [API level 17](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String (/reference/java/lang/String) ACTION_DREAMING_STARTED
```

Broadcast Action: Sent after the system starts dreaming.

This is a protected intent that can only be sent by the system. It is only sent to registered receivers.

Constant Value: "android.intent.action.DREAMING_STARTED"

ACTION_DREAMING_STOPPED

Added in [API level 17](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_DREAMING_STOPPED
```

Broadcast Action: Sent after the system stops dreaming.

This is a protected intent that can only be sent by the system. It is only sent to registered receivers.

Constant Value: "android.intent.action.DREAMING_STOPPED"

ACTION_EDIT

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_EDIT
```

Activity Action: Provide explicit editable access to the given data.

Input: `getData()` (/reference/android/content/Intent#getData()) is URI of data to be edited.

Output: nothing.

Constant Value: "android.intent.action.EDIT"

ACTION_EXTERNAL_APPLICATIONS_AVAILABLE

Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_EXTERNAL_APPLICATIONS_AVAILABLE
```

Broadcast Action: Resources for a set of packages (which were previously unavailable) are currently available since the media on which they exist is available. The extra data [EXTRA_CHANGED_PACKAGE_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_PACKAGE_LIST) contains a list of packages whose availability changed. The extra data [EXTRA_CHANGED_UID_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_UID_LIST) contains a list of uids of packages whose availability changed. Note that the packages in this list do *not* receive this broadcast. The specified set of packages are now available on the system.

Includes the following extras:

- [EXTRA_CHANGED_PACKAGE_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_PACKAGE_LIST) is the set of packages whose resources (were previously unavailable) are currently available. [EXTRA_CHANGED_UID_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_UID_LIST) is the set of uids of the packages whose resources (were previously unavailable) are currently available.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.EXTERNAL_APPLICATIONS_AVAILABLE"

ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE
```

Broadcast Action: Resources for a set of packages are currently unavailable since the media on which they exist is unavailable. The extra data [EXTRA_CHANGED_PACKAGE_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_PACKAGE_LIST) contains a list of packages whose availability changed. The extra data [EXTRA_CHANGED_UID_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_UID_LIST) contains a list of uids of packages whose availability changed. The specified set of packages can no longer be launched and are practically unavailable on the system.

Includes the following extras:

- [EXTRA_CHANGED_PACKAGE_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_PACKAGE_LIST) is the set of packages whose resources are no longer available. [EXTRA_CHANGED_UID_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_UID_LIST) is the set of packages whose resources are no longer available.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.EXTERNAL_APPLICATIONS_UNAVAILABLE"

ACTION_FACTORY_TEST Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_FACTORY_TEST
```

Activity Action: Main entry point for factory tests. Only used when the device is booting in factory test node. The implementing package must be installed in the system image.

Input: nothing

Output: nothing

Constant Value: "android.intent.action.FACTORY_TEST"

ACTION_GET_CONTENT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_GET_CONTENT
```

Activity Action: Allow the user to select a particular kind of data and return it. This is different than [ACTION_PICK](#) (/reference/android/content/Intent#ACTION_PICK) in that here we just say what kind of data is desired, not a URI of existing data from which the user can pick. An ACTION_GET_CONTENT could allow the user to create the data as it runs (for example taking a picture or recording a sound), let them browse over the web and download the desired data, etc.

There are two main ways to use this action: if you want a specific kind of data, such as a person contact, you set the MIME type to the kind of data you want and launch it with [Context#startActivity\(Intent\)](#). (/reference/android/content/Context#startActivity(android.content.Intent)). The system will then launch the best application to select that kind of data for you.

You may also be interested in any of a set of types of content the user can pick. For example, an e-mail application that wants to allow the user to add an attachment to an e-mail message can use this action to bring up a list of all of the types of content the user can attach.

In this case, you should wrap the GET_CONTENT intent with a chooser (through [createChooser\(Intent, CharSequence\)](#). (/reference/android/content/Intent#createChooser(android.content.Intent,%20java.lang.CharSequence))), which will give the proper interface for the user to pick how to send your data and allow you to specify a prompt indicating what they are doing. You will usually specify a broad MIME type (such as image/* or */*), resulting in a broad range of content types the user can select from.

When using such a broad GET_CONTENT action, it is often desirable to only pick from data that can be represented as a stream. This is accomplished by requiring the [CATEGORY_OPENABLE](/reference/android/content/Intent#CATEGORY_OPENABLE) in the Intent.

Callers can optionally specify [EXTRA_LOCAL_ONLY](/reference/android/content/Intent#EXTRA_LOCAL_ONLY) to request that the launched content chooser only returns results representing data that is locally available on the device. For example, if this extra is set to true then an image picker should not show any pictures that are available from a remote server but not already on the local device (thus requiring they be downloaded when opened).

If the caller can handle multiple returned items (the user performing multiple selection), then it can specify [EXTRA_ALLOW_MULTIPLE](/reference/android/content/Intent#EXTRA_ALLOW_MULTIPLE) to indicate this.

Input: [getType\(\)](/reference/android/content/Intent#getType()) is the desired MIME type to retrieve. Note that no URI is supplied in the intent, as there are no constraints on where the returned data originally comes from. You may also include the [CATEGORY_OPENABLE](/reference/android/content/Intent#CATEGORY_OPENABLE) if you can only accept data that can be opened as a stream. You may use [EXTRA_LOCAL_ONLY](/reference/android/content/Intent#EXTRA_LOCAL_ONLY) to limit content selection to local data. You may use [EXTRA_ALLOW_MULTIPLE](/reference/android/content/Intent#EXTRA_ALLOW_MULTIPLE) to allow the user to select multiple items.

Output: The URI of the item that was picked. This must be a content: URI so that any receiver can access it.

Constant Value: "android.intent.action.GET_CONTENT"

ACTION_GET_RESTRICTION_ENTRIES

Added in [API level 18](/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String ACTION_GET_RESTRICTION_ENTRIES
```

Broadcast to a specific application to query any supported restrictions to impose on restricted users. The broadcast intent contains an extra [EXTRA_RESTRICTIONS_BUNDLE](/reference/android/content/Intent#EXTRA_RESTRICTIONS_BUNDLE) with the currently persisted restrictions as a Bundle of key/value pairs. The value types can be Boolean, String or String[] depending on the restriction type.

The response should contain an extra [EXTRA_RESTRICTIONS_LIST](#) (/reference/android/content/Intent#EXTRA_RESTRICTIONS_LIST), which is of type `ArrayList<RestrictionEntry>`. It can also contain an extra [EXTRA_RESTRICTIONS_INTENT](#) (/reference/android/content/Intent#EXTRA_RESTRICTIONS_INTENT), which is of type `Intent`. The activity specified by that intent will be launched for a result which must contain one of the extras [EXTRA_RESTRICTIONS_LIST](#) (/reference/android/content/Intent#EXTRA_RESTRICTIONS_LIST) or [EXTRA_RESTRICTIONS_BUNDLE](#) (/reference/android/content/Intent#EXTRA_RESTRICTIONS_BUNDLE). The keys and values of the returned restrictions will be persisted.

See also:

[RestrictionEntry](#) (/reference/android/content/RestrictionEntry)

Constant Value: "android.intent.action.GET_RESTRICTION_ENTRIES"

ACTION_GTALK_SERVICE_CONNECTED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_GTALK_SERVICE_CONNECTED
```

Broadcast Action: A GTalk connection has been established.

Constant Value: "android.intent.action.GTALK_CONNECTED"

ACTION_GTALK_SERVICE_DISCONNECTED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_GTALK_SERVICE_DISCONNECTED
```

Broadcast Action: A GTalk connection has been disconnected.

Constant Value: "android.intent.action.GTALK_DISCONNECTED"

ACTION_HEADSET_PLUG

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_HEADSET_PLUG
```

Broadcast Action: Wired Headset plugged in or unplugged. Same as [AudioManager.ACTION_HEADSET_PLUG](#) (/reference/android/media/AudioManager#ACTION_HEADSET_PLUG), to be consulted for value and documentation.

If the minimum SDK version of your application is [Build.VERSION_CODES.LOLLIPOP](#) (/reference/android/os/Build.VERSION_CODES#LOLLIPOP), it is recommended to refer to the [AudioManager](#) constant in your receiver registration code instead.

Constant Value: "android.intent.action.HEADSET_PLUG"

ACTION_INPUT_METHOD_CHANGED

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_INPUT_METHOD_CHANGED
```

Broadcast Action: An input method has been changed.

Constant Value: "android.intent.action.INPUT_METHOD_CHANGED"

ACTION_INSERT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_INSERT
```

Activity Action: Insert an empty item into the given container.

Input: **getData()** (/reference/android/content/Intent#getData()) is URI of the directory (vnd.android.cursor.dir/*) in which to place the data.

Output: URI of the new data that was created.

Constant Value: "android.intent.action.INSERT"

ACTION_INSERT_OR_EDIT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_INSERT_OR_EDIT
```

Activity Action: Pick an existing item, or insert a new item, and then edit it.

Input: **getType()** (/reference/android/content/Intent#getType()) is the desired MIME type of the item to create or edit. The extras can contain type specific data to pass through to the editing/creating activity.

Output: The URI of the item that was picked. This must be a content: URI so that any receiver can access it.

Constant Value: "android.intent.action.INSERT_OR_EDIT"

ACTION_INSTALL_FAILURE

Added in [API level 27](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_INSTALL_FAILURE
```

Activity Action: Activity to handle split installation failures.

Splits may be installed dynamically. This happens when an Activity is launched, but the split that contains the application isn't installed. When a split is installed in this manner, the containing package usually doesn't know this is happening. However, if an error occurs during installation, the containing package can define a single activity handling this action to deal with such failures.

The activity handling this action must be in the base package.

Input: EXTRA_INTENT (/reference/android/content/Intent#EXTRA_INTENT) the original intent that started split installation.

EXTRA_SPLIT_NAME (/reference/android/content/Intent#EXTRA_SPLIT_NAME) the name of the split that failed to be installed.

Constant Value: "android.intent.action.INSTALL_FAILURE"

ACTION_INSTALL_PACKAGE

Added in [API level 14](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_INSTALL_PACKAGE
```

This constant was deprecated in API level 29.

use [PackageInstaller](#) (/reference/android/content/pm/PackageInstaller) instead

Activity Action: Launch application installer.

Input: The data must be a content: URI at which the application can be retrieved. As of [Build.VERSION_CODES.JELLY_BEAN_MR1](#) (/reference/android/os/Build.VERSION_CODES#JELLY_BEAN_MR1), you can also use "package:" to install an application for the current user that is already installed for another user. You can optionally supply [EXTRA_INSTALLER_PACKAGE_NAME](#) (/reference/android/content/Intent#EXTRA_INSTALLER_PACKAGE_NAME), [EXTRA_NOT_UNKNOWN_SOURCE](#)

(/reference/android/content/Intent#EXTRA_NOT_UNKNOWN_SOURCE), EXTRA_ALLOW_REPLACE (/reference/android/content/Intent#EXTRA_ALLOW_REPLACE), and EXTRA_RETURN_RESULT (/reference/android/content/Intent#EXTRA_RETURN_RESULT).

Output: If EXTRA_RETURN_RESULT (/reference/android/content/Intent#EXTRA_RETURN_RESULT), returns whether the install succeeded.

Note: If your app is targeting API level higher than 25 you need to hold Manifest.permission.REQUEST_INSTALL_PACKAGES (/reference/android/Manifest.permission#REQUEST_INSTALL_PACKAGES) in order to launch the application installer.

See also:

EXTRA_INSTALLER_PACKAGE_NAME (/reference/android/content/Intent#EXTRA_INSTALLER_PACKAGE_NAME)

EXTRA_NOT_UNKNOWN_SOURCE (/reference/android/content/Intent#EXTRA_NOT_UNKNOWN_SOURCE)

EXTRA_RETURN_RESULT (/reference/android/content/Intent#EXTRA_RETURN_RESULT)

Constant Value: "android.intent.action.INSTALL_PACKAGE"

ACTION_LOCALE_CHANGED

Added in API level 7 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_LOCALE_CHANGED
```

Broadcast Action: The current device's locale has changed.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.LOCALE_CHANGED"

ACTION_LOCKED_BOOT_COMPLETED

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_LOCKED_BOOT_COMPLETED
```

Broadcast Action: This is broadcast once, after the user has finished booting, but while still in the "locked" state. It can be used to perform application-specific initialization, such as installing alarms. You must hold the [Manifest.permission.RECEIVE_BOOT_COMPLETED](#) (/reference/android/Manifest.permission#RECEIVE_BOOT_COMPLETED) permission in order to receive this broadcast.

This broadcast is sent immediately at boot by all devices (regardless of direct boot support) running [Build.VERSION_CODES.N](#) (/reference/android/os/Build.VERSION_CODES#N) or higher. Upon receipt of this broadcast, the user is still locked and only device-protected storage can be accessed safely. If you want to access credential-protected storage, you need to wait for the user to be unlocked (typically by entering their lock pattern or PIN for the first time), after which the [ACTION_USER_UNLOCKED](#) (/reference/android/content/Intent#ACTION_USER_UNLOCKED) and [ACTION_BOOT_COMPLETED](#) (/reference/android/content/Intent#ACTION_BOOT_COMPLETED) broadcasts are sent.

To receive this broadcast, your receiver component must be marked as being [ComponentInfo#directBootAware](#) (/reference/android/content/pm/ComponentInfo#directBootAware).

This is a protected intent that can only be sent by the system.

See also:

[Context.createDeviceProtectedStorageContext\(\)](#) (/reference/android/content/Context#createDeviceProtectedStorageContext())

Constant Value: "android.intent.action.LOCKED_BOOT_COMPLETED"

ACTION_MAIN

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MAIN
```

Activity Action: Start as a main entry point, does not expect to receive data.

Input: nothing

Output: nothing

Constant Value: "android.intent.action.MAIN"

ACTION_MANAGED_PROFILE_ADDED

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MANAGED_PROFILE_ADDED
```

Broadcast sent to the primary user when an associated managed profile is added (the profile was created and is ready to be used).

Carries an extra [EXTRA_USER](#) (/reference/android/content/Intent#EXTRA_USER) that specifies the UserHandle of the profile that was added. Only applications (for example Launchers) that need to display merged content across both primary and managed profiles need to worry about this broadcast. This is only sent to registered receivers, not manifest receivers.

Constant Value: "android.intent.action.MANAGED_PROFILE_ADDED"

ACTION_MANAGED_PROFILE_AVAILABLE

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MANAGED_PROFILE_AVAILABLE
```

Broadcast sent to the primary user when an associated managed profile has become available. Currently this includes when the user disables quiet mode for the profile. Carries an extra [EXTRA_USER](#) (/reference/android/content/Intent#EXTRA_USER) that specifies the UserHandle of the profile. When quiet mode is changed, this broadcast will carry a boolean extra [EXTRA_QUIET_MODE](#) (/reference/android/content/Intent#EXTRA_QUIET_MODE) indicating the new state of quiet mode. This is only sent to registered receivers, not manifest receivers.

Constant Value: "android.intent.action.MANAGED_PROFILE_AVAILABLE"

ACTION_MANAGED_PROFILE_REMOVED

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MANAGED_PROFILE_REMOVED
```

Broadcast sent to the primary user when an associated managed profile is removed. Carries an extra [EXTRA_USER](#) (/reference/android/content/Intent#EXTRA_USER) that specifies the UserHandle of the profile that was removed. Only applications (for example Launchers) that need to display merged content across both primary and managed profiles need to worry about this broadcast. This is only sent to registered receivers, not manifest receivers.

Constant Value: "android.intent.action.MANAGED_PROFILE_REMOVED"

ACTION_MANAGED_PROFILE_UNAVAILABLE

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MANAGED_PROFILE_UNAVAILABLE
```


Broadcast sent to the primary user when an associated managed profile has become unavailable. Currently this includes when the user enables quiet mode for the profile. Carries an extra **EXTRA_USER** (/reference/android/content/Intent#EXTRA_USER) that specifies the UserHandle of the profile. When quiet mode is changed, this broadcast will carry a boolean extra **EXTRA_QUIET_MODE** (/reference/android/content/Intent#EXTRA_QUIET_MODE) indicating the new state of quiet mode. This is only sent to registered receivers, not manifest receivers.

Constant Value: "android.intent.action.MANAGED_PROFILE_UNAVAILABLE"

ACTION_MANAGED_PROFILE_UNLOCKED

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MANAGED_PROFILE_UNLOCKED
```

Broadcast sent to the primary user when the credential-encrypted private storage for an associated managed profile is unlocked. Carries an extra **EXTRA_USER** (/reference/android/content/Intent#EXTRA_USER) that specifies the UserHandle of the profile that was unlocked. Only applications (for example Launchers) that need to display merged content across both primary and managed profiles need to worry about this broadcast. This is only sent to registered receivers, not manifest receivers.

Constant Value: "android.intent.action.MANAGED_PROFILE_UNLOCKED"

ACTION_MANAGE_NETWORK_USAGE

Added in [API level 14](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MANAGE_NETWORK_USAGE
```

Activity Action: Show settings for managing network data usage of a specific application. Applications should define an activity that offers options to control data usage.

Constant Value: "android.intent.action.MANAGE_NETWORK_USAGE"

ACTION_MANAGE_PACKAGE_STORAGE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MANAGE_PACKAGE_STORAGE
```

Broadcast Action: Indicates low memory condition notification acknowledged by user and package management should be started. This is triggered by the user from the ACTION_DEVICE_STORAGE_LOW notification.

Constant Value: "android.intent.action.MANAGE_PACKAGE_STORAGE"

ACTION_MEDIA_BAD_REMOVAL

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_BAD_REMOVAL
```

Broadcast Action: External media was removed from SD card slot, but mount point was not unmounted. The path to the mount point for the removed media is contained in the Intent.mData field.

Constant Value: "android.intent.action.MEDIA_BAD_REMOVAL"

ACTION_MEDIA_BUTTON

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_BUTTON
```

Broadcast Action: The "Media Button" was pressed. Includes a single extra field, **EXTRA_KEY_EVENT** (/reference/android/content/Intent#EXTRA_KEY_EVENT), containing the key event that caused the broadcast.

Constant Value: "android.intent.action.MEDIA_BUTTON"

ACTION_MEDIA_CHECKING

Added in [API level 3](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String ACTION_MEDIA_CHECKING
```

Broadcast Action: External media is present, and being disk-checked The path to the mount point for the checking media is contained in the `Intent.mData` field.

Constant Value: "android.intent.action.MEDIA_CHECKING"

ACTION_MEDIA_EJECT

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String ACTION_MEDIA_EJECT
```

Broadcast Action: User has expressed the desire to remove the external storage media. Applications should close all files they have open within the mount point when they receive this intent. The path to the mount point for the media to be ejected is contained in the `Intent.mData` field.

Constant Value: "android.intent.action.MEDIA_EJECT"

ACTION_MEDIA_MOUNTED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_MOUNTED
```

Broadcast Action: External media is present and mounted at its mount point. The path to the mount point for the mounted media is contained in the Intent.mData field. The Intent contains an extra with name "read-only" and Boolean value to indicate if the media was mounted read only.

Constant Value: "android.intent.action.MEDIA_MOUNTED"

ACTION_MEDIA_NOFS

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_NOFS
```

Broadcast Action: External media is present, but is using an incompatible fs (or is blank) The path to the mount point for the checking media is contained in the Intent.mData field.

Constant Value: "android.intent.action.MEDIA_NOFS"

ACTION_MEDIA_REMOVED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_REMOVED
```

Broadcast Action: External media has been removed. The path to the mount point for the removed media is contained in the Intent.mData field.

Constant Value: "android.intent.action.MEDIA_REMOVED"

ACTION_MEDIA_SCANNER_FINISHED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_SCANNER_FINISHED
```

Broadcast Action: The media scanner has finished scanning a directory. The path to the scanned directory is contained in the Intent.mData field.

Constant Value: "android.intent.action.MEDIA_SCANNER_FINISHED"

ACTION_MEDIA_SCANNER_SCAN_FILE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_SCANNER_SCAN_FILE
```

This constant was deprecated in API level 29.

Callers should migrate to inserting items directly into [MediaStore](#) (/reference/android/provider/MediaStore), where they will be automatically scanned after each mutation.

Broadcast Action: Request the media scanner to scan a file and add it to the media database.

The path to the file is contained in `Intent#getData()` (/reference/android/content/Intent#getData()).

Constant Value: "android.intent.action.MEDIA_SCANNER_SCAN_FILE"

ACTION_MEDIA_SCANNER_STARTED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_SCANNER_STARTED
```

Broadcast Action: The media scanner has started scanning a directory. The path to the directory being scanned is contained in the `Intent.mData` field.

Constant Value: "android.intent.action.MEDIA_SCANNER_STARTED"

ACTION_MEDIA_SHARED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_SHARED
```

Broadcast Action: External media is unmounted because it is being shared via USB mass storage. The path to the mount point for the shared media is contained in the `Intent.mData` field.

Constant Value: "android.intent.action.MEDIA_SHARED"

ACTION_MEDIA_UNMOUNTABLE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_UNMOUNTABLE
```

Broadcast Action: External media is present but cannot be mounted. The path to the mount point for the unmountable media is contained in the Intent.mData field.

Constant Value: "android.intent.action.MEDIA_UNMOUNTABLE"

ACTION_MEDIA_UNMOUNTED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MEDIA_UNMOUNTED
```

Broadcast Action: External media is present, but not mounted at its mount point. The path to the mount point for the unmounted media is contained in the Intent.mData field.

Constant Value: "android.intent.action.MEDIA_UNMOUNTED"

ACTION_MY_PACKAGE_REPLACED

Added in [API level 12](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MY_PACKAGE_REPLACED
```

Broadcast Action: A new version of your application has been installed over an existing one. This is only sent to the application that was replaced. It does not contain any additional data; to receive it, just use an intent filter for this action.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.MY_PACKAGE_REPLACED"

ACTION_MY_PACKAGE_SUSPENDED

Added in [API level 28](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MY_PACKAGE_SUSPENDED
```

Broadcast Action: Sent to a package that has been suspended by the system. This is sent whenever a package is put into a suspended state or any of its app extras change while in the suspended state.

Optionally includes the following extras:

- [EXTRA_SUSPENDED_PACKAGE_EXTRAS](#) (/reference/android/content/Intent#EXTRA_SUSPENDED_PACKAGE_EXTRAS) which is a [Bundle](#) (/reference/android/os/Bundle) which will contain useful information for the app being suspended.

This is a protected intent that can only be sent by the system. *This will be delivered to [BroadcastReceiver](#) (/reference/android/content/BroadcastReceiver) components declared in the manifest.*

See also:

[ACTION_MY_PACKAGE_UNSUSPENDED](#) (/reference/android/content/Intent#ACTION_MY_PACKAGE_UNSUSPENDED)

[EXTRA_SUSPENDED_PACKAGE_EXTRAS](#) (/reference/android/content/Intent#EXTRA_SUSPENDED_PACKAGE_EXTRAS)

[PackageManager.isPackageSuspended\(\)](#) (/reference/android/content/pm/PackageManager#isPackageSuspended())

[PackageManager.getSuspendedPackageAppExtras\(\)](#) (/reference/android/content/pm/PackageManager#getSuspendedPackageAppExtras())

Constant Value: "android.intent.action.MY_PACKAGE_SUSPENDED"

ACTION_MY_PACKAGE_UNRESUMED

Added in [API level 28](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_MY_PACKAGE_UNRESUMED
```

Broadcast Action: Sent to a package that has been unresumed.

This is a protected intent that can only be sent by the system. *This will be delivered to **[BroadcastReceiver](#)*** (/reference/android/content/BroadcastReceiver) *components declared in the manifest.*

See also:

[ACTION_MY_PACKAGE_RESUMED](#) (/reference/android/content/Intent#ACTION_MY_PACKAGE_RESUMED)

[EXTRA_RESUMED_PACKAGE_EXTRAS](#) (/reference/android/content/Intent#EXTRA_RESUMED_PACKAGE_EXTRAS)

[PackageManager.isPackageResumed\(\)](#) (/reference/android/content/pm/PackageManager#isPackageResumed())

[PackageManager.getResumedPackageAppExtras\(\)](#) (/reference/android/content/pm/PackageManager#getResumedPackageAppExtras())

Constant Value: "android.intent.action.MY_PACKAGE_UNRESUMED"

ACTION_NEW_OUTGOING_CALL

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_NEW_OUTGOING_CALL
```

This constant was deprecated in API level 29.

Apps that redirect outgoing calls should use the [CallRedirectionService](#) (/reference/android/telecom/CallRedirectionService) API. Apps that perform call screening should use the [CallScreeningService](#) (/reference/android/telecom/CallScreeningService) API. Apps which need to be notified of basic call state should use [PhoneStateListener.onCallStateChanged\(int, String\)](#).

(/reference/android/telephony/PhoneStateListener#onCallStateChanged(int,%20java.lang.String)) to determine when a new outgoing call is placed.

Broadcast Action: An outgoing call is about to be placed.

The Intent will have the following extra value:

- [EXTRA_PHONE_NUMBER](#) (/reference/android/content/Intent#EXTRA_PHONE_NUMBER) - the phone number originally intended to be dialed.

Once the broadcast is finished, the `resultData` is used as the actual number to call. If `null`, no call will be placed.

It is perfectly acceptable for multiple receivers to process the outgoing call in turn: for example, a parental control application might verify that the user is authorized to place the call at that time, then a number-rewriting application might add an area code if one was not specified.

For consistency, any receiver whose purpose is to prohibit phone calls should have a priority of 0, to ensure it will see the final phone number to be dialed. Any receiver whose purpose is to rewrite phone numbers to be called should have a positive priority. Negative priorities are reserved for the system for this broadcast; using them may cause problems.

Any `BroadcastReceiver` receiving this Intent *must not* abort the broadcast.

Emergency calls cannot be intercepted using this mechanism, and other calls cannot be modified to call emergency numbers using this mechanism.

Some apps (such as VoIP apps) may want to redirect the outgoing call to use their own service instead. Those apps should first prevent the call from being placed by setting `resultData` to `null` and then start their own app to make the call.

You must hold the **Manifest.permission.PROCESS_OUTGOING_CALLS**

(/reference/android/Manifest.permission#PROCESS_OUTGOING_CALLS) permission to receive this Intent.

This is a protected intent that can only be sent by the system.

If the user has chosen a **CallRedirectionService** (</reference/android/telecom/CallRedirectionService>) to handle redirection of outgoing calls, this intent will NOT be sent as an ordered broadcast. This means that attempts to re-write the outgoing call by other apps using this intent will be ignored.

Constant Value: "android.intent.action.NEW_OUTGOING_CALL"

ACTION_OPEN_DOCUMENT

Added in [API level 19](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String ACTION_OPEN_DOCUMENT
```

Activity Action: Allow the user to select and return one or more existing documents. When invoked, the system will display the various **DocumentsProvider** (</reference/android/provider/DocumentsProvider>) instances installed on the device, letting the user interactively navigate through them. These documents include local media, such as photos and video, and documents provided by installed cloud storage providers.

Each document is represented as a `content://` URI backed by a **DocumentsProvider** (</reference/android/provider/DocumentsProvider>), which can be opened as a stream with **ContentResolver#openFileDescriptor(Uri, String)**

([/reference/android/content/ContentResolver#openFileDescriptor\(android.net.Uri,%20java.lang.String\)](/reference/android/content/ContentResolver#openFileDescriptor(android.net.Uri,%20java.lang.String))), or queried for **DocumentsContract.Document** (</reference/android/provider/DocumentsContract.Document>) metadata.

All selected documents are returned to the calling application with persistable read and write permission grants. If you want to maintain access to the documents across device reboots, you need to explicitly take the persistable permissions using

[ContentResolver#takePersistableUriPermission\(Uri, int\)](#)

(/reference/android/content/ContentResolver#takePersistableUriPermission(android.net.Uri,%20int)).

Callers must indicate the acceptable document MIME types through [setType\(java.lang.String\)](#).

(/reference/android/content/Intent#setType(java.lang.String)). For example, to select photos, use `image/*`. If multiple disjoint MIME types are acceptable, define them in [EXTRA_MIME_TYPES](#) (/reference/android/content/Intent#EXTRA_MIME_TYPES) and [setType\(java.lang.String\)](#) (/reference/android/content/Intent#setType(java.lang.String)) to `*/*`.

If the caller can handle multiple returned items (the user performing multiple selection), then you can specify

[EXTRA_ALLOW_MULTIPLE](#) (/reference/android/content/Intent#EXTRA_ALLOW_MULTIPLE) to indicate this.

Callers must include [CATEGORY_OPENABLE](#) (/reference/android/content/Intent#CATEGORY_OPENABLE) in the Intent to obtain URIs that can be opened with [ContentResolver#openFileDescriptor\(Uri, String\)](#).

(/reference/android/content/ContentResolver#openFileDescriptor(android.net.Uri,%20java.lang.String)).

Callers can set a document URI through [DocumentsContract#EXTRA_INITIAL_URI](#)

(/reference/android/provider/DocumentsContract#EXTRA_INITIAL_URI) to indicate the initial location of documents navigator. System will do its best to launch the navigator in the specified document if it's a folder, or the folder that contains the specified document if not.

Output: The URI of the item that was picked, returned in [getData\(\)](#) (/reference/android/content/Intent#getData()). This must be a `content://` URI so that any receiver can access it. If multiple documents were selected, they are returned in [getClipData\(\)](#) (/reference/android/content/Intent#getClipData()).

See also:

[DocumentsContract](#) (/reference/android/provider/DocumentsContract)

[ACTION_OPEN_DOCUMENT_TREE](#) (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT_TREE)

[ACTION_CREATE_DOCUMENT](#) (/reference/android/content/Intent#ACTION_CREATE_DOCUMENT)

[FLAG_GRANT_PERSISTABLE_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION)

Constant Value: "android.intent.action.OPEN_DOCUMENT"

ACTION_OPEN_DOCUMENT_TREE

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_OPEN_DOCUMENT_TREE
```

Activity Action: Allow the user to pick a directory subtree. When invoked, the system will display the various [DocumentsProvider](#) (/reference/android/provider/DocumentsProvider) instances installed on the device, letting the user navigate through them. Apps can fully manage documents within the returned directory.

To gain access to descendant (child, grandchild, etc) documents, use [DocumentsContract#buildDocumentUriUsingTree\(Uri, String\)](#) (/reference/android/provider/DocumentsContract#buildDocumentUriUsingTree(android.net.Uri,%20java.lang.String)) and [DocumentsContract#buildChildDocumentsUriUsingTree\(Uri, String\)](#) (/reference/android/provider/DocumentsContract#buildChildDocumentsUriUsingTree(android.net.Uri,%20java.lang.String)) with the returned URI.

Callers can set a document URI through [DocumentsContract#EXTRA_INITIAL_URI](#) (/reference/android/provider/DocumentsContract#EXTRA_INITIAL_URI) to indicate the initial location of documents navigator. System will do its best to launch the navigator in the specified document if it's a folder, or the folder that contains the specified document if not.

Output: The URI representing the selected directory tree.

See also:

[DocumentsContract](#) (/reference/android/provider/DocumentsContract)

Constant Value: "android.intent.action.OPEN_DOCUMENT_TREE"

ACTION_PACKAGES_SUSPENDED

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGES_SUSPENDED
```

Broadcast Action: Packages have been suspended.

Includes the following extras:

- [EXTRA_CHANGED_PACKAGE_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_PACKAGE_LIST) is the set of packages which have been suspended
- [EXTRA_CHANGED_UID_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_UID_LIST) is the set of uids which have been suspended

This is a protected intent that can only be sent by the system. It is only sent to registered receivers.

Constant Value: "android.intent.action.PACKAGES_SUSPENDED"

ACTION_PACKAGES_UNSUSPENDED

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGES_UNSUSPENDED
```

Broadcast Action: Packages have been unsususpended.

Includes the following extras:

- **EXTRA_CHANGED_PACKAGE_LIST** (/reference/android/content/Intent#EXTRA_CHANGED_PACKAGE_LIST) is the set of packages which have been unsuspended
- **EXTRA_CHANGED_UID_LIST** (/reference/android/content/Intent#EXTRA_CHANGED_UID_LIST) is the set of uids which have been unsuspended

This is a protected intent that can only be sent by the system. It is only sent to registered receivers.

Constant Value: "android.intent.action.PACKAGES_UNSPENDED"

ACTION_PACKAGE_ADDED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_ADDED
```

Broadcast Action: A new application package has been installed on the device. The data contains the name of the package. Note that the newly installed package does *not* receive this broadcast.

May include the following extras:

- **EXTRA_UID** (/reference/android/content/Intent#EXTRA_UID) containing the integer uid assigned to the new package.
- **EXTRA_REPLACING** (/reference/android/content/Intent#EXTRA_REPLACING) is set to true if this is following an **ACTION_PACKAGE_REMOVED** (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) broadcast for the same package.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_ADDED"

ACTION_PACKAGE_CHANGED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_CHANGED
```

Broadcast Action: An existing application package has been changed (for example, a component has been enabled or disabled). The data contains the name of the package.

- [EXTRA_UID](#) (/reference/android/content/Intent#EXTRA_UID) containing the integer uid assigned to the package.
- [EXTRA_CHANGED_COMPONENT_NAME_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_COMPONENT_NAME_LIST) containing the class name of the changed components (or the package name itself).
- [EXTRA_DONT_KILL_APP](#) (/reference/android/content/Intent#EXTRA_DONT_KILL_APP) containing boolean field to override the default action of restarting the application.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_CHANGED"

ACTION_PACKAGE_DATA_CLEARED

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_DATA_CLEARED
```

Broadcast Action: The user has cleared the data of a package. This should be preceded by [ACTION_PACKAGE_RESTARTED](#) (/reference/android/content/Intent#ACTION_PACKAGE_RESTARTED), after which all of its persistent data is erased and this broadcast sent. Note that the cleared package does *not* receive this broadcast. The data contains the name of the package.

- **EXTRA_UID** (/reference/android/content/Intent#EXTRA_UID) containing the integer uid assigned to the package. If the package whose data was cleared is an uninstalled instant app, then the UID will be -1. The platform keeps some meta-data associated with instant apps after they are uninstalled.
- **EXTRA_PACKAGE_NAME** (/reference/android/content/Intent#EXTRA_PACKAGE_NAME) containing the package name only if the cleared data was for an instant app.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_DATA_CLEARED"

ACTION_PACKAGE_FIRST_LAUNCH

Added in [API level 12](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_FIRST_LAUNCH
```

Broadcast Action: Sent to the installer package of an application when that application is first launched (that is the first time it is moved out of the stopped state). The data contains the name of the package.

When the application is first launched, the application itself doesn't receive this broadcast.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_FIRST_LAUNCH"

ACTION_PACKAGE_FULLY_REMOVED

Added in [API level 14](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_FULLY_REMOVED
```

Broadcast Action: An existing application package has been completely removed from the device. The data contains the name of the package. This is like [ACTION_PACKAGE_REMOVED](#) (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED), but only set when [EXTRA_DATA_REMOVED](#) (/reference/android/content/Intent#EXTRA_DATA_REMOVED) is true and [EXTRA_REPLACING](#) (/reference/android/content/Intent#EXTRA_REPLACING) is false of that broadcast.

- [EXTRA_UID](#) (/reference/android/content/Intent#EXTRA_UID) containing the integer uid previously assigned to the package.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_FULLY_REMOVED"

ACTION_PACKAGE_INSTALL

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_INSTALL
```

This constant was deprecated in API level 15.

This constant has never been used.

Broadcast Action: Trigger the download and eventual installation of a package.

Input: [getData\(\)](#) (/reference/android/content/Intent#getData()) is the URI of the package file to download.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_INSTALL"

ACTION_PACKAGE_NEEDS_VERIFICATION

Added in [API level 14](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_NEEDS_VERIFICATION
```

Broadcast Action: Sent to the system package verifier when a package needs to be verified. The data contains the package URI.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_NEEDS_VERIFICATION"

ACTION_PACKAGE_REMOVED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_REMOVED
```

Broadcast Action: An existing application package has been removed from the device. The data contains the name of the package. The package that is being removed does *not* receive this Intent.

- [EXTRA_UID](#) (/reference/android/content/Intent#EXTRA_UID) containing the integer uid previously assigned to the package.

- **EXTRA_DATA_REMOVED** (/reference/android/content/Intent#EXTRA_DATA_REMOVED) is set to true if the entire application -- data and code -- is being removed.
- **EXTRA_REPLACING** (/reference/android/content/Intent#EXTRA_REPLACING) is set to true if this will be followed by an **ACTION_PACKAGE_ADDED** (/reference/android/content/Intent#ACTION_PACKAGE_ADDED) broadcast for the same package.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_REMOVED"

ACTION_PACKAGE_REPLACED

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_REPLACED
```

Broadcast Action: A new version of an application package has been installed, replacing an existing version that was previously installed. The data contains the name of the package.

May include the following extras:

- **EXTRA_UID** (/reference/android/content/Intent#EXTRA_UID) containing the integer uid assigned to the new package.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_REPLACED"

ACTION_PACKAGE_RESTARTED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_RESTARTED
```

Broadcast Action: The user has restarted a package, and all of its processes have been killed. All runtime state associated with it (processes, alarms, notifications, etc) should be removed. Note that the restarted package does *not* receive this broadcast. The data contains the name of the package.

- [EXTRA_UID](#) (/reference/android/content/Intent#EXTRA_UID) containing the integer uid assigned to the package.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_RESTARTED"

ACTION_PACKAGE_VERIFIED

Added in [API level 17](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PACKAGE_VERIFIED
```

Broadcast Action: Sent to the system package verifier when a package is verified. The data contains the package URI.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.PACKAGE_VERIFIED"

ACTION_PASTE

Added in [API level 11](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PASTE
```

Activity Action: Create a new item in the given container, initializing it from the current contents of the clipboard.

Input: [getData\(\)](#) (/reference/android/content/Intent#getData()) is URI of the directory (vnd.android.cursor.dir/*) in which to place the data.

Output: URI of the new data that was created.

Constant Value: "android.intent.action.PASTE"

ACTION_PICK

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PICK
```

Activity Action: Pick an item from the data, returning what was selected.

Input: [getData\(\)](#) (/reference/android/content/Intent#getData()) is URI containing a directory of data (vnd.android.cursor.dir/*) from which to pick an item.

Output: The URI of the item that was picked.

Constant Value: "android.intent.action.PICK"

ACTION_PICK_ACTIVITY

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PICK_ACTIVITY
```

Activity Action: Pick an activity given an intent, returning the class selected.

Input: get*Extra field [EXTRA_INTENT](#) (/reference/android/content/Intent#EXTRA_INTENT) is an Intent used with

[PackageManager#queryIntentActivities](#)

(/reference/android/content/pm/PackageManager#queryIntentActivities(android.content.Intent,%20int)) to determine the set of activities from which to pick.

Output: Class name of the activity that was selected.

Constant Value: "android.intent.action.PICK_ACTIVITY"

ACTION_POWER_CONNECTED

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_POWER_CONNECTED
```

Broadcast Action: External power has been connected to the device. This is intended for applications that wish to register specifically to this notification. Unlike ACTION_BATTERY_CHANGED, applications will be woken for this and so do not have to stay active to receive this notification. This action can be used to implement actions that wait until power is available to trigger.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.ACTION_POWER_CONNECTED"

ACTION_POWER_DISCONNECTED

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_POWER_DISCONNECTED
```

Broadcast Action: External power has been removed from the device. This is intended for applications that wish to register specifically to this notification. Unlike ACTION_BATTERY_CHANGED, applications will be woken for this and so do not have to stay active to receive this notification. This action can be used to implement actions that wait until power is available to trigger.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.ACTION_POWER_DISCONNECTED"

ACTION_POWER_USAGE_SUMMARY

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_POWER_USAGE_SUMMARY
```

Activity Action: Show power usage information to the user.

Input: Nothing.

Output: Nothing.

Constant Value: "android.intent.action.POWER_USAGE_SUMMARY"

ACTION_PROCESS_TEXT

Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PROCESS_TEXT
```

Activity Action: Process a piece of text.

Input: [EXTRA_PROCESS_TEXT](#) (/reference/android/content/Intent#EXTRA_PROCESS_TEXT) contains the text to be processed.

[EXTRA_PROCESS_TEXT_READONLY](#) (/reference/android/content/Intent#EXTRA_PROCESS_TEXT_READONLY) states if the resulting text will be read-only.

Output: [EXTRA_PROCESS_TEXT](#) (/reference/android/content/Intent#EXTRA_PROCESS_TEXT) contains the processed text.

Constant Value: "android.intent.action.PROCESS_TEXT"

ACTION_PROVIDER_CHANGED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_PROVIDER_CHANGED
```

Broadcast Action: Some content providers have parts of their namespace where they publish new events or items that the user may be especially interested in. For these things, they may broadcast this action when the set of interesting items change. For example, GmailProvider sends this notification when the set of unread mail in the inbox changes.

The data of the intent identifies which part of which provider changed. When queried through the content resolver, the data URI will return the data set in question.

The intent will have the following extra values:

- *count* - The number of items in the data set. This is the same as the number of items in the cursor returned by querying the data URI.

This intent will be sent at boot (if the count is non-zero) and when the data set changes. It is possible for the data set to change without the count changing (for example, if a new unread message arrives in the same sync operation in which a message is archived). The phone should still ring/vibrate/etc as normal in this case.

Constant Value: "android.intent.action.PROVIDER_CHANGED"

ACTION_QUICK_CLOCK

Added in [API level 17](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String ACTION_QUICK_CLOCK
```

Sent when the user taps on the clock widget in the system's "quick settings" area.

Constant Value: "android.intent.action.QUICK_CLOCK"

ACTION_QUICK_VIEW

Added in [API level 24](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String ACTION_QUICK_VIEW
```

Activity Action: Quick view the data. Launches a quick viewer for a URI or a list of URIs.

Activities handling this intent action should handle the vast majority of MIME types rather than only specific ones.

Quick viewers must render the quick view image locally, and must not send file content outside current device.

Input: `getData()` (/reference/android/content/Intent#getData()) is a mandatory content URI of the item to preview. `getClipData()` (/reference/android/content/Intent#getClipData()) contains an optional list of content URIs if there is more than one item to preview. `EXTRA_INDEX` (/reference/android/content/Intent#EXTRA_INDEX) is an optional index of the URI in the clip data to show first. `EXTRA_QUICK_VIEW_FEATURES` (/reference/android/content/Intent#EXTRA_QUICK_VIEW_FEATURES) is an optional extra indicating the features that can be shown in the quick view UI.

Output: nothing.

See also:

`EXTRA_INDEX` (/reference/android/content/Intent#EXTRA_INDEX)

`EXTRA_QUICK_VIEW_FEATURES` (/reference/android/content/Intent#EXTRA_QUICK_VIEW_FEATURES)

Constant Value: "android.intent.action.QUICK_VIEW"

ACTION_REBOOT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_REBOOT
```

Broadcast Action: Have the device reboot. This is only for use by system code.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.REBOOT"

ACTION_RUN

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_RUN
```

Activity Action: Run the data, whatever that means.

Input: ? (Note: this is currently specific to the test harness.)

Output: nothing.

Constant Value: "android.intent.action.RUN"

ACTION_SCREEN_OFF

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SCREEN_OFF
```

Broadcast Action: Sent when the device goes to sleep and becomes non-interactive.

For historical reasons, the name of this broadcast action refers to the power state of the screen but it is actually sent in response to changes in the overall interactive state of the device.

This broadcast is sent when the device becomes non-interactive which may have nothing to do with the screen turning off. To determine the actual state of the screen, use [Display.getState\(\)](#) (/reference/android/view/Display#getState()).

See [PowerManager.isInteractive\(\)](#) (/reference/android/os/PowerManager#isInteractive()) for details.

You *cannot* receive this through components declared in manifests, only by explicitly registering for it with [Context#registerReceiver\(BroadcastReceiver, IntentFilter\)](#).

(/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)).

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.SCREEN_OFF"

ACTION_SCREEN_ON

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SCREEN_ON
```

Broadcast Action: Sent when the device wakes up and becomes interactive.

For historical reasons, the name of this broadcast action refers to the power state of the screen but it is actually sent in response to changes in the overall interactive state of the device.

This broadcast is sent when the device becomes interactive which may have nothing to do with the screen turning on. To determine the actual state of the screen, use [Display.getState\(\)](#) (/reference/android/view/Display#getState()).

See [PowerManager.isInteractive\(\)](#) (/reference/android/os/PowerManager#isInteractive()) for details.

You *cannot* receive this through components declared in manifests, only by explicitly registering for it with [Context.registerReceiver\(BroadcastReceiver, IntentFilter\)](#).

(/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)).

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.SCREEN_ON"

ACTION_SEARCH

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SEARCH
```

Activity Action: Perform a search.

Input: [getStringExtra\(SearchManager.QUERY\)](#) (/reference/android/app/SearchManager#QUERY) is the text to search for. If empty, simply enter your search results Activity with the search UI activated.

Output: nothing.

Constant Value: "android.intent.action.SEARCH"

ACTION_SEARCH_LONG_PRESS

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SEARCH_LONG_PRESS
```

Activity Action: Start action associated with long pressing on the search key.

Input: Nothing.

Output: Nothing.

Constant Value: "android.intent.action.SEARCH_LONG_PRESS"

ACTION_SEND

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SEND
```

Activity Action: Deliver some data to someone else. Who the data is being delivered to is not specified; it is up to the receiver of this action to ask the user where the data should be sent.

When launching a SEND intent, you should usually wrap it in a chooser (through [createChooser\(Intent, CharSequence\)](#) (/reference/android/content/Intent#createChooser(android.content.Intent,%20java.lang.CharSequence))), which will give the proper interface for the user to pick how to send your data and allow you to specify a prompt indicating what they are doing.

Input: [getType\(\)](#) (/reference/android/content/Intent#getType()) is the MIME type of the data being sent. [get*Extra](#) can have either a [EXTRA_TEXT](#) (/reference/android/content/Intent#EXTRA_TEXT) or [EXTRA_STREAM](#) (/reference/android/content/Intent#EXTRA_STREAM) field, containing the data to be sent. If using EXTRA_TEXT, the MIME type should be "text/plain"; otherwise it should be the MIME type of the data in EXTRA_STREAM. Use */* if the MIME type is unknown (this will only allow senders that can handle generic data streams). If using [EXTRA_TEXT](#) (/reference/android/content/Intent#EXTRA_TEXT), you can also optionally supply [EXTRA_HTML_TEXT](#) (/reference/android/content/Intent#EXTRA_HTML_TEXT) for clients to retrieve your text with HTML formatting.

As of [Build.VERSION_CODES.JELLY_BEAN](#) (/reference/android/os/Build.VERSION_CODES#JELLY_BEAN), the data being sent can be supplied through [setClipData\(android.content.ClipData\)](#) (/reference/android/content/Intent#setClipData(android.content.ClipData)). This allows you to use [FLAG_GRANT_READ_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) when sharing content: URLs and other advanced features of [ClipData](#) (/reference/android/content/ClipData). If using this approach, you still must supply the same data through the [EXTRA_TEXT](#) (/reference/android/content/Intent#EXTRA_TEXT) or [EXTRA_STREAM](#) (/reference/android/content/Intent#EXTRA_STREAM) fields described below for compatibility with old applications. If you don't set a ClipData, it will be copied there for you when calling [Context.startActivity\(Intent\)](#) (/reference/android/content/Context#startActivity(android.content.Intent)).

Starting from [Build.VERSION_CODES.0](#) (/reference/android/os/Build.VERSION_CODES#0), if [CATEGORY_TYPED_OPENABLE](#) (/reference/android/content/Intent#CATEGORY_TYPED_OPENABLE) is passed, then the Uris passed in either [EXTRA_STREAM](#) (/reference/android/content/Intent#EXTRA_STREAM) or via [setClipData\(android.content.ClipData\)](#) (/reference/android/content/Intent#setClipData(android.content.ClipData)) may be openable only as asset typed files using

[ContentResolver#openTypedAssetFileDescriptor\(Uri, String, Bundle\)](#)

(/reference/android/content/ContentResolver#openTypedAssetFileDescriptor(android.net.Uri,%20java.lang.String,%20android.os.Bundle)).

Optional standard extras, which may be interpreted by some recipients as appropriate, are: [EXTRA_EMAIL](#)

(/reference/android/content/Intent#EXTRA_EMAIL), [EXTRA_CC](#) (/reference/android/content/Intent#EXTRA_CC), [EXTRA_BCC](#)

(/reference/android/content/Intent#EXTRA_BCC), [EXTRA_SUBJECT](#) (/reference/android/content/Intent#EXTRA_SUBJECT).

Output: nothing.

Constant Value: "android.intent.action.SEND"

[ACTION_SENDTO](#)

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SENDTO
```

Activity Action: Send a message to someone specified by the data.

Input: [getData\(\)](#) (/reference/android/content/Intent#getData()) is URI describing the target.

Output: nothing.

Constant Value: "android.intent.action.SENDTO"

[ACTION_SEND_MULTIPLE](#)

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SEND_MULTIPLE
```


Activity Action: Deliver multiple data to someone else.

Like **ACTION_SEND** (/reference/android/content/Intent#ACTION_SEND), except the data is multiple.

Input: **getType()** ([/reference/android/content/Intent#getType\(\)](/reference/android/content/Intent#getType())) is the MIME type of the data being sent. `get*ArrayListExtra` can have either a **EXTRA_TEXT** (/reference/android/content/Intent#EXTRA_TEXT) or **EXTRA_STREAM** (/reference/android/content/Intent#EXTRA_STREAM) field, containing the data to be sent. If using **EXTRA_TEXT** (/reference/android/content/Intent#EXTRA_TEXT), you can also optionally supply **EXTRA_HTML_TEXT** (/reference/android/content/Intent#EXTRA_HTML_TEXT) for clients to retrieve your text with HTML formatting.

Multiple types are supported, and receivers should handle mixed types whenever possible. The right way for the receiver to check them is to use the content resolver on each URI. The intent sender should try to put the most concrete mime type in the intent type, but it can fall back to `<type>/*` or `/*/*` as needed.

e.g. if you are sending `image/jpg` and `image/png`, the intent's type can be `image/jpg`, but if you are sending `image/jpg` and `image/png`, then the intent's type should be `image/*`.

As of **Build.VERSION_CODES.JELLY_BEAN** (/reference/android/os/Build.VERSION_CODES#JELLY_BEAN), the data being sent can be supplied through **setClipData(android.content.ClipData)** ([/reference/android/content/Intent#setClipData\(android.content.ClipData\)](/reference/android/content/Intent#setClipData(android.content.ClipData))). This allows you to use **FLAG_GRANT_READ_URI_PERMISSION** (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) when sharing content: URIs and other advanced features of **ClipData** (</reference/android/content/ClipData>). If using this approach, you still must supply the same data through the **EXTRA_TEXT** (/reference/android/content/Intent#EXTRA_TEXT) or **EXTRA_STREAM** (/reference/android/content/Intent#EXTRA_STREAM) fields described below for compatibility with old applications. If you don't set a `ClipData`, it will be copied there for you when calling **Context.startActivity(Intent)** ([/reference/android/content/Context#startActivity\(android.content.Intent\)](/reference/android/content/Context#startActivity(android.content.Intent))).

Starting from **Build.VERSION_CODES.0** (/reference/android/os/Build.VERSION_CODES#0), if **CATEGORY_TYPED_OPENABLE** (/reference/android/content/Intent#CATEGORY_TYPED_OPENABLE) is passed, then the `Uri` passed in either **EXTRA_STREAM** (/reference/android/content/Intent#EXTRA_STREAM) or via **setClipData(android.content.ClipData)** ([/reference/android/content/Intent#setClipData\(android.content.ClipData\)](/reference/android/content/Intent#setClipData(android.content.ClipData))) may be openable only as asset typed files using **ContentResolver.openTypedAssetFileDescriptor(Uri, String, Bundle)** ([/reference/android/content/ContentResolver#openTypedAssetFileDescriptor\(android.net.Uri,%20java.lang.String,%20android.os.Bundle\)](/reference/android/content/ContentResolver#openTypedAssetFileDescriptor(android.net.Uri,%20java.lang.String,%20android.os.Bundle))).

Optional standard extras, which may be interpreted by some recipients as appropriate, are: EXTRA_EMAIL (/reference/android/content/Intent#EXTRA_EMAIL), EXTRA_CC (/reference/android/content/Intent#EXTRA_CC), EXTRA_BCC (/reference/android/content/Intent#EXTRA_BCC), EXTRA_SUBJECT (/reference/android/content/Intent#EXTRA_SUBJECT).

Output: nothing.

Constant Value: "android.intent.action.SEND_MULTIPLE"

ACTION_SET_WALLPAPER

Added in API level 1 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SET_WALLPAPER
```

Activity Action: Show settings for choosing wallpaper.

Input: Nothing.

Output: Nothing.

Constant Value: "android.intent.action.SET_WALLPAPER"

ACTION_SHOW_APP_INFO

Added in API level 24 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SHOW_APP_INFO
```

Activity Action: Launch an activity showing the app information. For applications which install other applications (such as app stores), it is recommended to handle this action for providing the app information to the user.

Input: **EXTRA_PACKAGE_NAME** (/reference/android/content/Intent#EXTRA_PACKAGE_NAME) specifies the package whose information needs to be displayed.

Output: Nothing.

Constant Value: "android.intent.action.SHOW_APP_INFO"

ACTION_SHUTDOWN

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SHUTDOWN
```

Broadcast Action: Device is shutting down. This is broadcast when the device is being shut down (completely turned off, not sleeping). Once the broadcast is complete, the final shutdown will proceed and all unsaved data lost. Apps will not normally need to handle this, since the foreground activity will be paused as well.

As of [Build.VERSION_CODES#P](#) (/reference/android/os/Build.VERSION_CODES#P) this broadcast is only sent to receivers registered through [Context#registerReceiver\(\[BroadcastReceiver\]\(#\), \[IntentFilter\]\(#\)\)](#).
(/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)).

This is a protected intent that can only be sent by the system.

May include the following extras:

- [EXTRA_SHUTDOWN_USERSPACE_ONLY](#) (/reference/android/content/Intent#EXTRA_SHUTDOWN_USERSPACE_ONLY) a boolean that is set to true if this shutdown is only for userspace processes. If not set, assumed to be false.

Constant Value: "android.intent.action.ACTION_SHUTDOWN"

ACTION_SYNC

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SYNC
```

Activity Action: Perform a data synchronization.

Input: ?

Output: ?

Constant Value: "android.intent.action.SYNC"

ACTION_SYSTEM_TUTORIAL

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_SYSTEM_TUTORIAL
```

Activity Action: Start the platform-defined tutorial

Input: [getStringExtra\(SearchManager.QUERY\)](#) (/reference/android/app/SearchManager#QUERY) is the text to search for. If empty, simply enter your search results Activity with the search UI activated.

Output: nothing.

Constant Value: "android.intent.action.SYSTEM_TUTORIAL"

ACTION_TIMEZONE_CHANGED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_TIMEZONE_CHANGED
```

Broadcast Action: The timezone has changed. The intent will have the following extra values:

- *time-zone* - The `java.util.TimeZone.getID()` value identifying the new time zone.

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.TIMEZONE_CHANGED"

ACTION_TIME_CHANGED

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_TIME_CHANGED
```

Broadcast Action: The time was set.

Constant Value: "android.intent.action.TIME_SET"

ACTION_TIME_TICK

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_TIME_TICK
```

Broadcast Action: The current time has changed. Sent every minute. You *cannot* receive this through components declared in manifests, only by explicitly registering for it with `Context#registerReceiver\(BroadcastReceiver, IntentFilter\)`.

(/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)).

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.TIME_TICK"

ACTION_TRANSLATE

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_TRANSLATE
```

Activity Action: Perform text translation.

Input: [getCharSequence\(EXTRA_TEXT\)](#) (/reference/android/content/Intent#EXTRA_TEXT) is the text to translate.

Output: nothing.

Constant Value: "android.intent.action.TRANSLATE"

ACTION_UID_REMOVED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_UID_REMOVED
```

Broadcast Action: A user ID has been removed from the system. The user ID number is stored in the extra data under [EXTRA_UID](#) (/reference/android/content/Intent#EXTRA_UID).

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.UID_REMOVED"

ACTION_UMS_CONNECTED

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 15](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String ACTION_UMS_CONNECTED
```

This constant was deprecated in API level 15.

replaced by android.os.storage.StorageEventListener

Broadcast Action: The device has entered USB Mass Storage mode. This is used mainly for the USB Settings panel. Apps should listen for ACTION_MEDIA_MOUNTED and ACTION_MEDIA_UNMOUNTED broadcasts to be notified when the SD card file system is mounted or unmounted

Constant Value: "android.intent.action.UMS_CONNECTED"

ACTION_UMS_DISCONNECTED

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 15](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String ACTION_UMS_DISCONNECTED
```

This constant was deprecated in API level 15.

replaced by `android.os.storage.StorageEventListener`

Broadcast Action: The device has exited USB Mass Storage mode. This is used mainly for the USB Settings panel. Apps should listen for `ACTION_MEDIA_MOUNTED` and `ACTION_MEDIA_UNMOUNTED` broadcasts to be notified when the SD card file system is mounted or unmounted

Constant Value: `"android.intent.action.UMS_DISCONNECTED"`

`ACTION_UNINSTALL_PACKAGE`

Added in [API level 14](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 29](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String ACTION_UNINSTALL_PACKAGE
```

This constant was deprecated in API level 29.

Use [`PackageInstaller.uninstall\(String, IntentSender\)`](#)

([`PackageInstaller.uninstall\(java.lang.String,%20android.content.IntentSender\)`](/reference/android/content/pm/PackageInstaller#uninstall(java.lang.String,%20android.content.IntentSender))) instead

Activity Action: Launch application uninstaller.

Input: The data must be a package: URI whose scheme specific part is the package name of the current installed package to be uninstalled. You can optionally supply [`EXTRA_RETURN_RESULT`](/reference/android/content/Intent#EXTRA_RETURN_RESULT) (/reference/android/content/Intent#EXTRA_RETURN_RESULT).

Output: If [`EXTRA_RETURN_RESULT`](/reference/android/content/Intent#EXTRA_RETURN_RESULT) (/reference/android/content/Intent#EXTRA_RETURN_RESULT), returns whether the install succeeded.

Requires [`Manifest.permission.REQUEST_DELETE_PACKAGES`](/reference/android/Manifest.permission#REQUEST_DELETE_PACKAGES) (/reference/android/Manifest.permission#REQUEST_DELETE_PACKAGES) since [`Build.VERSION_CODES#P`](/reference/android/os/Build.VERSION_CODES#P) (/reference/android/os/Build.VERSION_CODES#P).

Constant Value: "android.intent.action.UNINSTALL_PACKAGE"

ACTION_USER_BACKGROUND

Added in [API level 17](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_USER_BACKGROUND
```

Sent when a user switch is happening, causing the process's user to be sent to the background. This is only sent to receivers registered through [Context#registerReceiver\(BroadcastReceiver, IntentFilter\)](#).

(/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)). It is sent to the user that is going to the background. This is sent as a foreground broadcast, since it is part of a visible user interaction; be as quick as possible when handling it.

Constant Value: "android.intent.action.USER_BACKGROUND"

ACTION_USER_FOREGROUND

Added in [API level 17](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_USER_FOREGROUND
```

Sent when a user switch is happening, causing the process's user to be brought to the foreground. This is only sent to receivers registered through [Context#registerReceiver\(BroadcastReceiver, IntentFilter\)](#).

(/reference/android/content/Context#registerReceiver(android.content.BroadcastReceiver,%20android.content.IntentFilter)). It is sent to the user that is going to the foreground. This is sent as a foreground broadcast, since it is part of a visible user interaction; be as quick as possible when handling it.

Constant Value: "android.intent.action.USER_FOREGROUND"

ACTION_USER_INITIALIZE

Added in [API level 17](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_USER_INITIALIZE
```

Sent the first time a user is starting, to allow system apps to perform one time initialization. (This will not be seen by third party applications because a newly initialized user does not have any third party applications installed for it.) This is sent early in starting the user, around the time the home app is started, before [ACTION_BOOT_COMPLETED](#) (/reference/android/content/Intent#ACTION_BOOT_COMPLETED) is sent. This is sent as a foreground broadcast, since it is part of a visible user interaction; be as quick as possible when handling it.

Constant Value: "android.intent.action.USER_INITIALIZE"

ACTION_USER_PRESENT

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_USER_PRESENT
```

Broadcast Action: Sent when the user is present after device wakes up (e.g when the keyguard is gone).

This is a protected intent that can only be sent by the system.

Constant Value: "android.intent.action.USER_PRESENT"

ACTION_USER_UNLOCKED

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_USER_UNLOCKED
```

Broadcast Action: Sent when the credential-encrypted private storage has become unlocked for the target user. This is only sent to registered receivers, not manifest receivers.

Constant Value: "android.intent.action.USER_UNLOCKED"

ACTION_VIEW

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_VIEW
```

Activity Action: Display the data to the user. This is the most common action performed on data – it is the generic action you can use on a piece of data to get the most reasonable thing to occur. For example, when used on a contacts entry it will view the entry; when used on a mailto: URI it will bring up a compose window filled with the information supplied by the URI; when used with a tel: URI it will invoke the dialer.

Input: [getData\(\)](#) (/reference/android/content/Intent#getData()) is URI from which to retrieve data.

Output: nothing.

Constant Value: "android.intent.action.VIEW"

ACTION_VIEW_LOCUS

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_VIEW_LOCUS
```

Activity Action: Display an activity state associated with an unique LocusId (/reference/android/content/LocusId).

For example, a chat app could use the context to resume a conversation between 2 users.

Input: EXTRA_LOCUS_ID (/reference/android/content/Intent#EXTRA_LOCUS_ID) specifies the unique identifier of the locus in the app domain. Should be stable across reboots and backup / restore.

Output: nothing.

Constant Value: "android.intent.action.VIEW_LOCUS"

ACTION_VIEW_PERMISSION_USAGE

Added in API level 29 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_VIEW_PERMISSION_USAGE
```

Activity action: Launch UI to show information about the usage of a given permission. This action would be handled by apps that want to show details about how and why given permission is being used.

Important: You must protect the activity that handles this action with the START_VIEW_PERMISSION_USAGE (/reference/android/Manifest.permission#START_VIEW_PERMISSION_USAGE) permission to ensure that only the system can launch this activity. The system will not launch activities that are not properly protected.

Input: `android.intent.extra.PERMISSION_NAME` specifies the permission for which the launched UI would be targeted.

Output: Nothing.

Requires Manifest.permission.START_VIEW_PERMISSION_USAGE

(/reference/android/Manifest.permission#START_VIEW_PERMISSION_USAGE)

Constant Value: "android.intent.action.VIEW_PERMISSION_USAGE"

ACTION_VOICE_COMMAND

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_VOICE_COMMAND
```

Activity Action: Start Voice Command.

Input: Nothing.

Output: Nothing.

In some cases, a matching Activity may not exist, so ensure you safeguard against this.

Constant Value: "android.intent.action.VOICE_COMMAND"

ACTION_WALLPAPER_CHANGED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) ACTION_WALLPAPER_CHANGED
```

This constant was deprecated in API level 16.

Modern applications should use [WindowManager.LayoutParams.FLAG_SHOW_WALLPAPER](#)

([/reference/android/view/WindowManager.LayoutParams#FLAG_SHOW_WALLPAPER](#)) to have the wallpaper shown behind their UI, rather than watching for this broadcast and rendering the wallpaper on their own.

Broadcast Action: The current system wallpaper has changed. See [WallpaperManager](#) ([/reference/android/app/WallpaperManager](#)) for retrieving the new wallpaper. This should *only* be used to determine when the wallpaper has changed to show the new wallpaper to the user. You should certainly never, in response to this, change the wallpaper or other attributes of it such as the suggested size. That would be crazy, right? You'd cause all kinds of loops, especially if other apps are doing similar things, right? Of course. So please don't do this.

Constant Value: "android.intent.action.WALLPAPER_CHANGED"

ACTION_WEB_SEARCH

Added in [API level 1](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final String (/reference/java/lang/String) ACTION_WEB_SEARCH
```

Activity Action: Perform a web search.

Input: [getStringExtra\(SearchManager.QUERY\)](#) ([/reference/android/app/SearchManager#QUERY](#)) is the text to search for. If it is a url starts with http or https, the site will be opened. If it is plain text, Google search will be applied.

Output: nothing.

Constant Value: "android.intent.action.WEB_SEARCH"

CATEGORY_ACCESSIBILITY_SHORTCUT_TARGET

Added in [Android R](#) ([/preview](#))

```
public static final String (/reference/java/lang/String) CATEGORY_ACCESSIBILITY_SHORTCUT_TARGET
```

The accessibility shortcut is a global gesture for users with disabilities to trigger an important for them accessibility feature to help developers determine whether they want to make their activity a shortcut target.

An activity of interest to users with accessibility needs may request to be the target of the accessibility shortcut. It handles intent **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) with this category, which will be dispatched by the system when the user activates the shortcut when it is configured to point at this target.

An activity declared itself to be a target of the shortcut in AndroidManifest.xml. It must also do two things:

- Specify that it handles the **android.intent.action.MAIN Intent** (/reference/android/content/Intent) with category **android.intent.category.ACCESSIBILITY_SHORTCUT_TARGET**.

- Provide a meta-data entry **android.accessibilityshortcut.target** in the manifest when declaring the activity.

If either of these items is missing, the system will ignore the accessibility shortcut target. Following is an example declaration:

```
<activity android:name=".MainActivity"
. . .
  <intent-filter>
    <action android:name="android.intent.action.MAIN" />
    <category android:name="android.intent.category.ACCESSIBILITY_SHORTCUT_TARGET" />
  </intent-filter>
  <meta-data android:name="android.accessibilityshortcut.target"
    android:resource="@xml/accessibilityshortcut" />
</activity>
```

This is a sample XML file configuring a accessibility shortcut target:

```
<accessibility-shortcut-target
  android:description="@string/shortcut_target_description"
  android:summary="@string/shortcut_target_summary" />
```

Both description and summary are necessary. The system will ignore the accessibility shortcut target if they are missing.

Constant Value: "android.intent.category.ACCESSIBILITY_SHORTCUT_TARGET"

CATEGORY_ALTERNATIVE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_ALTERNATIVE
```

Set if the activity should be considered as an alternative action to the data the user is currently viewing. See also [CATEGORY_SELECTED_ALTERNATIVE](#) (/reference/android/content/Intent#CATEGORY_SELECTED_ALTERNATIVE) for an alternative action that applies to the selection in a list of items.

Supporting this category means that you would like your activity to be displayed in the set of alternative things the user can do, usually as part of the current activity's options menu. You will usually want to include a specific label in the <intent-filter> of this action describing to the user what it does.

The action of `IntentFilter` with this category is important in that it describes the specific action the target will perform. This generally should not be a generic action (such as [ACTION_VIEW](#) (/reference/android/content/Intent#ACTION_VIEW), but rather a specific name such as "com.android.camera.action.CROP. Only one alternative of any particular action will be shown to the user, so using a specific action like this makes sure that your alternative will be displayed while also allowing other applications to provide their own overrides of that particular action.

Constant Value: "android.intent.category.ALTERNATIVE"

CATEGORY_APP_BROWSER

Added in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_APP_BROWSER
```

Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch the browser application. The activity should be able to browse the Internet.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with [makeMainSelectorActivity\(java.lang.String, java.lang.String\)](#).

(/reference/android/content/Intent#makeMainSelectorActivity(java.lang.String,%20java.lang.String)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_BROWSER"

CATEGORY_APP_CALCULATOR

Added in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_APP_CALCULATOR
```

Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch the calculator application. The activity should be able to perform standard arithmetic operations.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with [makeMainSelectorActivity\(java.lang.String, java.lang.String\)](#).

([/reference/android/content/Intent#makeMainSelectorActivity\(java.lang.String,%20java.lang.String\)](#)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_CALCULATOR"

CATEGORY_APP_CALENDAR

Added in [API level 15](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final String (/reference/java/lang/String) CATEGORY_APP_CALENDAR
```

Used with [ACTION_MAIN](#) ([/reference/android/content/Intent#ACTION_MAIN](#)) to launch the calendar application. The activity should be able to view and manipulate calendar entries.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with [makeMainSelectorActivity\(java.lang.String, java.lang.String\)](#).

([/reference/android/content/Intent#makeMainSelectorActivity\(java.lang.String,%20java.lang.String\)](#)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_CALENDAR"

CATEGORY_APP_CONTACTS

Added in [API level 15](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final String (/reference/java/lang/String) CATEGORY_APP_CONTACTS
```

Used with [ACTION_MAIN](#) ([/reference/android/content/Intent#ACTION_MAIN](#)) to launch the contacts application. The activity should be able to view and manipulate address book entries.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with `makeMainSelectorActivity(java.lang.String, _java.lang.String)` ([/reference/android/content/Intent#makeMainSelectorActivity\(java.lang.String,%20java.lang.String\)](#)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_CONTACTS"

CATEGORY_APP_EMAIL

Added in [API level 15](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final String (/reference/java/lang/String) CATEGORY_APP_EMAIL
```

Used with [ACTION_MAIN](#) ([/reference/android/content/Intent#ACTION_MAIN](#)) to launch the email application. The activity should be able to send and receive email.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with `makeMainSelectorActivity(java.lang.String, _java.lang.String)` ([/reference/android/content/Intent#makeMainSelectorActivity\(java.lang.String,%20java.lang.String\)](#)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_EMAIL"

CATEGORY_APP_FILES

Added in [API level 29](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final String (/reference/java/lang/String) CATEGORY_APP_FILES
```

Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch the files application. The activity should be able to browse and manage files stored on the device.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with [makeMainSelectorActivity\(java.lang.String, java.lang.String\)](#). (/reference/android/content/Intent#makeMainSelectorActivity(java.lang.String,%20java.lang.String)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_FILES"

CATEGORY_APP_GALLERY

Added in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_APP_GALLERY
```

Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch the gallery application. The activity should be able to view and manipulate image and video files stored on the device.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with [makeMainSelectorActivity\(java.lang.String, java.lang.String\)](#). (/reference/android/content/Intent#makeMainSelectorActivity(java.lang.String,%20java.lang.String)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_GALLERY"

CATEGORY_APP_MAPS

Added in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_APP_MAPS
```

Used with **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) to launch the maps application. The activity should be able to show the user's current location and surroundings.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with **makeMainSelectorActivity(java.lang.String, java.lang.String)**.
(/reference/android/content/Intent#makeMainSelectorActivity(java.lang.String,%20java.lang.String)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_MAPS"

CATEGORY_APP_MARKET

Added in API level 11 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_APP_MARKET
```

This activity allows the user to browse and download new applications.

Constant Value: "android.intent.category.APP_MARKET"

CATEGORY_APP_MESSAGING

Added in API level 15 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_APP_MESSAGING
```

Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch the messaging application. The activity should be able to send and receive text messages.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with [makeMainSelectorActivity\(java.lang.String, java.lang.String\)](#). (/reference/android/content/Intent#makeMainSelectorActivity(java.lang.String,%20java.lang.String)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_MESSAGING"

CATEGORY_APP_MUSIC

Added in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_APP_MUSIC
```

Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch the music application. The activity should be able to play, browse, or manipulate music files stored on the device.

NOTE: This should not be used as the primary key of an Intent, since it will not result in the app launching with the correct action and category. Instead, use this with [makeMainSelectorActivity\(java.lang.String, java.lang.String\)](#). (/reference/android/content/Intent#makeMainSelectorActivity(java.lang.String,%20java.lang.String)) to generate a main Intent with this category in the selector.

Constant Value: "android.intent.category.APP_MUSIC"

CATEGORY_BROWSABLE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_BROWSABLE
```

Activities that can be safely invoked from a browser must support this category. For example, if the user is viewing a web page or an e-mail and clicks on a link in the text, the Intent generated execute that link will require the BROWSABLE category, so that only activities supporting this category will be considered as possible actions. By supporting this category, you are promising that there is nothing damaging (without user intervention) that can happen by invoking any matching Intent.

Constant Value: "android.intent.category.BROWSABLE"

CATEGORY_CAR_DOCK

Added in [API level 5](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_CAR_DOCK
```

An activity to run when device is inserted into a car dock. Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch an activity. For more information, see [UiModeManager](#) (/reference/android/app/UiModeManager).

Constant Value: "android.intent.category.CAR_DOCK"

CATEGORY_CAR_MODE

Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_CAR_MODE
```

Used to indicate that the activity can be used in a car environment.

Constant Value: "android.intent.category.CAR_MODE"

CATEGORY_DEFAULT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_DEFAULT
```

Set if the activity should be an option for the default action (center press) to perform on a piece of data. Setting this will hide from the user any activities without it set when performing an action on some data. Note that this is normally -not- set in the Intent when initiating an action -- it is for use in intent filters specified in packages.

Constant Value: "android.intent.category.DEFAULT"

CATEGORY_DESK_DOCK

Added in [API level 5](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_DESK_DOCK
```

An activity to run when device is inserted into a car dock. Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch an activity. For more information, see [UiModeManager](#) (/reference/android/app/UiModeManager).

Constant Value: "android.intent.category.DESK_DOCK"

CATEGORY_DEVELOPMENT_PREFERENCE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_DEVELOPMENT_PREFERENCE
```

This activity is a development preference panel.

Constant Value: "android.intent.category.DEVELOPMENT_PREFERENCE"

CATEGORY_EMBED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_EMBED
```

Capable of running inside a parent activity container.

Constant Value: "android.intent.category.EMBED"

CATEGORY_FRAMEWORK_INSTRUMENTATION_TEST

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_FRAMEWORK_INSTRUMENTATION_TEST
```

To be used as code under test for framework instrumentation tests.

Constant Value: "android.intent.category.FRAMEWORK_INSTRUMENTATION_TEST"

CATEGORY_HE_DESK_DOCK

Added in [API level 11](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_HE_DESK_DOCK
```

An activity to run when device is inserted into a digital (high end) dock. Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch an activity. For more information, see [UiModeManager](#) (</reference/android/app/UiModeManager>).

Constant Value: "android.intent.category.HE_DESK_DOCK"

CATEGORY_HOME

Added in [API level 1](#) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String (/reference/java/lang/String) CATEGORY_HOME
```

This is the home activity, that is the first activity that is displayed when the device boots.

Constant Value: "android.intent.category.HOME"

CATEGORY_INFO

Added in [API level 3](#) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final String (/reference/java/lang/String) CATEGORY_INFO
```

Provides information about the package it is in; typically used if a package does not contain a [CATEGORY_LAUNCHER](#) (/reference/android/content/Intent#CATEGORY_LAUNCHER) to provide a front-door to the user without having to be shown in the all apps list.

Constant Value: "android.intent.category.INFO"

CATEGORY_LAUNCHER

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_LAUNCHER
```

Should be displayed in the top-level launcher.

Constant Value: "android.intent.category.LAUNCHER"

CATEGORY_LEANBACK_LAUNCHER

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_LEANBACK_LAUNCHER
```

Indicates an activity optimized for Leanback mode, and that should be displayed in the Leanback launcher.

Constant Value: "android.intent.category.LEANBACK_LAUNCHER"

CATEGORY_LE_DESK_DOCK

Added in [API level 11](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_LE_DESK_DOCK
```

An activity to run when device is inserted into a analog (low end) dock. Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch an activity. For more information, see [UiModeManager](#) (/reference/android/app/UiModeManager).

Constant Value: "android.intent.category.LE_DESK_DOCK"

CATEGORY_MONKEY

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_MONKEY
```

This activity may be exercised by the monkey or other automated test tools.

Constant Value: "android.intent.category.MONKEY"

CATEGORY_OPENABLE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_OPENABLE
```

Used to indicate that an intent only wants URIs that can be opened with [ContentResolver#openFileDescriptor\(Uri, String\)](#) (/reference/android/content/ContentResolver#openFileDescriptor(android.net.Uri,%20java.lang.String)). Openable URIs must support at least the columns defined in [OpenableColumns](#) (/reference/android/provider/OpenableColumns) when queried.

See also:

[ACTION_GET_CONTENT](#) (/reference/android/content/Intent#ACTION_GET_CONTENT)

[ACTION_OPEN_DOCUMENT](#) (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT)

[ACTION_CREATE_DOCUMENT](#) (/reference/android/content/Intent#ACTION_CREATE_DOCUMENT)

Constant Value: "android.intent.category.OPENABLE"

CATEGORY_PREFERENCE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_PREFERENCE
```

This activity is a preference panel.

Constant Value: "android.intent.category.PREFERENCE"

CATEGORY_SAMPLE_CODE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_SAMPLE_CODE
```

To be used as a sample code example (not part of the normal user experience).

Constant Value: "android.intent.category.SAMPLE_CODE"

CATEGORY_SECONDARY_HOME

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_SECONDARY_HOME
```

The home activity shown on secondary displays that support showing home activities.

Constant Value: "android.intent.category.SECONDARY_HOME"

CATEGORY_SELECTED_ALTERNATIVE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_SELECTED_ALTERNATIVE
```

Set if the activity should be considered as an alternative selection action to the data the user has currently selected. This is like [CATEGORY_ALTERNATIVE](#) (/reference/android/content/Intent#CATEGORY_ALTERNATIVE), but is used in activities showing a list of items from which the user can select, giving them alternatives to the default action that will be performed on it.

Constant Value: "android.intent.category.SELECTED_ALTERNATIVE"

CATEGORY_TAB

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_TAB
```

Intended to be used as a tab inside of a containing TabActivity.

Constant Value: "android.intent.category.TAB"

CATEGORY_TEST

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_TEST
```

To be used as a test (not part of the normal user experience).

Constant Value: "android.intent.category.TEST"

CATEGORY_TYPED_OPENABLE

Added in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_TYPED_OPENABLE
```

Used to indicate that an intent filter can accept files which are not necessarily openable by

[ContentResolver#openFileDescriptor\(Uri, String\)](#).

(/reference/android/content/ContentResolver#openFileDescriptor(android.net.Uri,%20java.lang.String)), but at least streamable via

[ContentResolver#openTypedAssetFileDescriptor\(Uri, String, Bundle\)](#).

(/reference/android/content/ContentResolver#openTypedAssetFileDescriptor(android.net.Uri,%20java.lang.String,%20android.os.Bundle)) using one of the stream types exposed via [ContentResolver#getStreamTypes\(Uri, String\)](#).

(/reference/android/content/ContentResolver#getStreamTypes(android.net.Uri,%20java.lang.String)).

See also:

[ACTION_SEND](#) (/reference/android/content/Intent#ACTION_SEND)

[ACTION_SEND_MULTIPLE](#) (/reference/android/content/Intent#ACTION_SEND_MULTIPLE)

Constant Value: "android.intent.category.TYPED_OPENABLE"

CATEGORY_UNIT_TEST

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_UNIT_TEST
```

To be used as a unit test (run through the Test Harness).

Constant Value: "android.intent.category.UNIT_TEST"

CATEGORY_VOICE

Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_VOICE
```

Categories for activities that can participate in voice interaction. An activity that supports this category must be prepared to run with no UI shown at all (though in some case it may have a UI shown), and rely on [VoiceInteractor](#) (/reference/android/app/VoiceInteractor) to interact with the user.

Constant Value: "android.intent.category.VOICE"

CATEGORY_VR_HOME

Added in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) CATEGORY_VR_HOME
```

An activity to use for the launcher when the device is placed in a VR Headset viewer. Used with [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) to launch an activity. For more information, see [UiModeManager](#) (/reference/android/app/UiModeManager).

Constant Value: "android.intent.category.VR_HOME"

EXTRA_ALARM_COUNT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ALARM_COUNT
```


Used as an int extra field in [AlarmManager](/reference/android/app/AlarmManager) (/reference/android/app/AlarmManager) intents to tell the application being invoked how many pending alarms are being delivered with the intent. For one-shot alarms this will always be 1. For recurring alarms, this might be greater than 1 if the device was asleep or powered off at the time an earlier alarm would have been delivered.

Constant Value: "android.intent.extra.ALARM_COUNT"

EXTRA_ALLOW_MULTIPLE

Added in [API level 18](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ALLOW_MULTIPLE
```

Extra used to indicate that an intent can allow the user to select and return multiple items. This is a boolean extra; the default is false. If true, an implementation is allowed to present the user with a UI where they can pick multiple items that are all returned to the caller. When this happens, they should be returned as the [getClipData\(\)](/reference/android/content/Intent#getClipData()) (/reference/android/content/Intent#getClipData()) part of the result Intent.

See also:

[ACTION_GET_CONTENT](/reference/android/content/Intent#ACTION_GET_CONTENT) (/reference/android/content/Intent#ACTION_GET_CONTENT)

[ACTION_OPEN_DOCUMENT](/reference/android/content/Intent#ACTION_OPEN_DOCUMENT) (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT)

Constant Value: "android.intent.extra.ALLOW_MULTIPLE"

EXTRA_ALLOW_REPLACE

Added in [API level 14](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 16](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ALLOW_REPLACE
```

This constant was deprecated in API level 16.

As of [Build.VERSION_CODES.JELLY_BEAN](#) (/reference/android/os/Build.VERSION_CODES#JELLY_BEAN), Android will no longer show an interstitial message about updating existing applications so this is no longer needed.

Used as a boolean extra field with [ACTION_INSTALL_PACKAGE](#) (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) to install a package. Tells the installer UI to skip the confirmation with the user if the .apk is replacing an existing one.

Constant Value: "android.intent.extra.ALLOW_REPLACE"

EXTRA_ALTERNATE_INTENTS

Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ALTERNATE_INTENTS
```

An `Intent[]` describing additional, alternate choices you would like shown with [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER).

An app may be capable of providing several different payload types to complete a user's intended action. For example, an app invoking [ACTION_SEND](#) (/reference/android/content/Intent#ACTION_SEND) to share photos with another app may use `EXTRA_ALTERNATE_INTENTS` to have the chooser transparently offer several different supported sending mechanisms for sharing, such as the actual "image/*" photo data or a hosted link where the photos can be viewed.

The intent present in [EXTRA_INTENT](#) (/reference/android/content/Intent#EXTRA_INTENT) will be treated as the first/primary/preferred intent in the set. Additional intents specified in this extra are ordered; by default intents that appear earlier in the array will be preferred over intents that appear later in the array as matches for the same target component. To alter this preference, a calling app may also supply [EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER](#) (/reference/android/content/Intent#EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER).

Constant Value: "android.intent.extra.ALTERNATE_INTENTS"

EXTRA_ASSIST_CONTEXT

Added in [API level 18](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ASSIST_CONTEXT
```

An optional field on [ACTION_ASSIST](#) (/reference/android/content/Intent#ACTION_ASSIST) and containing additional contextual information supplied by the current foreground app at the time of the assist request. This is a [Bundle](#) (/reference/android/os/Bundle) of additional data.

Constant Value: "android.intent.extra.ASSIST_CONTEXT"

EXTRA_ASSIST_INPUT_DEVICE_ID

Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ASSIST_INPUT_DEVICE_ID
```

An optional field on [ACTION_ASSIST](#) (/reference/android/content/Intent#ACTION_ASSIST) containing the InputDevice id that was used to invoke the assist.

Constant Value: "android.intent.extra.ASSIST_INPUT_DEVICE_ID"

EXTRA_ASSIST_INPUT_HINT_KEYBOARD

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ASSIST_INPUT_HINT_KEYBOARD
```

An optional field on [ACTION_ASSIST](#) (/reference/android/content/Intent#ACTION_ASSIST) suggesting that the user will likely use a keyboard as the primary input device for assistance.

Constant Value: "android.intent.extra.ASSIST_INPUT_HINT_KEYBOARD"

EXTRA_ASSIST_PACKAGE

Added in [API level 18](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ASSIST_PACKAGE
```

An optional field on [ACTION_ASSIST](#) (/reference/android/content/Intent#ACTION_ASSIST) containing the name of the current foreground application package at the time the assist was invoked.

Constant Value: "android.intent.extra.ASSIST_PACKAGE"

EXTRA_ASSIST_UID

Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ASSIST_UID
```

An optional field on [ACTION_ASSIST](#) (/reference/android/content/Intent#ACTION_ASSIST) containing the uid of the current foreground application package at the time the assist was invoked.

Constant Value: "android.intent.extra.ASSIST_UID"

EXTRA_AUTO_LAUNCH_SINGLE_CHOICE

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_AUTO_LAUNCH_SINGLE_CHOICE
```

Used as a boolean extra field in [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER) intents to specify whether to show the chooser or not when there is only one application available to choose from.

Constant Value: "android.intent.extra.AUTO_LAUNCH_SINGLE_CHOICE"

EXTRA_BCC

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_BCC
```

A `String[]` holding e-mail addresses that should be blind carbon copied.

Constant Value: "android.intent.extra.BCC"

EXTRA_BUG_REPORT

Added in [API level 14](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_BUG_REPORT
```

Used as a parcelable extra field in [ACTION_APP_ERROR](#) (/reference/android/content/Intent#ACTION_APP_ERROR), containing the bug report.

Constant Value: "android.intent.extra.BUG_REPORT"

EXTRA_CC

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CC
```

A `String[]` holding e-mail addresses that should be carbon copied.

Constant Value: "android.intent.extra.CC"

EXTRA_CHANGED_COMPONENT_NAME

Added in [API level 5](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CHANGED_COMPONENT_NAME
```

This constant was deprecated in API level 15.

See [EXTRA_CHANGED_COMPONENT_NAME_LIST](#) (/reference/android/content/Intent#EXTRA_CHANGED_COMPONENT_NAME_LIST); this field will contain only the first name in the list.

Constant Value: "android.intent.extra.changed_component_name"

EXTRA_CHANGED_COMPONENT_NAME_LIST

Added in [API level 7](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CHANGED_COMPONENT_NAME_LIST
```

This field is part of [**ACTION_PACKAGE_CHANGED**](#) (/reference/android/content/Intent#ACTION_PACKAGE_CHANGED), and contains a string array of all of the components that have changed. If the state of the overall package has changed, then it will contain an entry with the package name itself.

Constant Value: "android.intent.extra.changed_component_name_list"

EXTRA_CHANGED_PACKAGE_LIST

Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CHANGED_PACKAGE_LIST
```

This field is part of [**ACTION_EXTERNAL_APPLICATIONS_AVAILABLE**](#)

(/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_AVAILABLE), [**ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE**](#)

(/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE), [**ACTION_PACKAGES_SUSPENDED**](#)

(/reference/android/content/Intent#ACTION_PACKAGES_SUSPENDED), [**ACTION_PACKAGES_UNSPENDED**](#)

(/reference/android/content/Intent#ACTION_PACKAGES_UNSPENDED) and contains a string array of all of the components that have changed.

Constant Value: "android.intent.extra.changed_package_list"

EXTRA_CHANGED_UID_LIST

Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CHANGED_UID_LIST
```

This field is part of [**ACTION_EXTERNAL_APPLICATIONS_AVAILABLE**](#)

(/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_AVAILABLE), [**ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE**](#)

(/reference/android/content/Intent#ACTION_EXTERNAL_APPLICATIONS_UNAVAILABLE) and contains an integer array of uids of all of the components that have changed.

Constant Value: "android.intent.extra.changed_uid_list"

EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER
```

An [IntentSender](#) (/reference/android/content/IntentSender) for an Activity that will be invoked when the user makes a selection from the chooser activity presented by [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER).

An app preparing an action for another app to complete may wish to allow the user to disambiguate between several options for completing the action based on the chosen target or otherwise refine the action before it is invoked.

When sent, this IntentSender may be filled in with the following extras:

- [EXTRA_INTENT](#) (/reference/android/content/Intent#EXTRA_INTENT) The first intent that matched the user's chosen target
- [EXTRA_ALTERNATE_INTENTS](#) (/reference/android/content/Intent#EXTRA_ALTERNATE_INTENTS) Any additional intents that also matched the user's chosen target beyond the first
- [EXTRA_RESULT_RECEIVER](#) (/reference/android/content/Intent#EXTRA_RESULT_RECEIVER) A [ResultReceiver](#) (/reference/android/os/ResultReceiver) that the refinement activity should fill in and send once the disambiguation is complete

Constant Value: "android.intent.extra.CHOOSER_REFINEMENT_INTENT_SENDER"

EXTRA_CHOOSER_TARGETS

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CHOOSER_TARGETS
```

A [ChooserTarget\[\]](#) (/reference/android/service/chooser/ChooserTarget) for [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER) describing additional high-priority deep-link targets for the chooser to present to the user.

Targets provided in this way will be presented inline with all other targets provided by services from other apps. They will be prioritized before other service targets, but after those targets provided by sources that the user has manually pinned to the front.

See also:

[ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER)

Constant Value: "android.intent.extra.CHOOSER_TARGETS"

EXTRA_CHOSEN_COMPONENT

Added in [API level 22](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CHOSEN_COMPONENT
```

The [ComponentName](#) (/reference/android/content/ComponentName) chosen by the user to complete an action.

See also:

[EXTRA_CHOSEN_COMPONENT_INTENT_SENDER](#) (/reference/android/content/Intent#EXTRA_CHOSEN_COMPONENT_INTENT_SENDER)

Constant Value: "android.intent.extra.CHOSEN_COMPONENT"

EXTRA_CHOSEN_COMPONENT_INTENT_SENDER Added in [API level 22](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CHOSEN_COMPONENT_INTENT_SENDER
```

An [IntentSender](#) (/reference/android/content/IntentSender) that will be notified if a user successfully chooses a target component to handle an action in an [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER) activity. The IntentSender will have the extra [EXTRA_CHOSEN_COMPONENT](#) (/reference/android/content/Intent#EXTRA_CHOSEN_COMPONENT) appended to it containing the [ComponentName](#) (/reference/android/content/ComponentName) of the chosen component.

In some situations this callback may never come, for example if the user abandons the chooser, switches to another task or any number of other reasons. Apps should not be written assuming that this callback will always occur.

Constant Value: "android.intent.extra.CHOSEN_COMPONENT_INTENT_SENDER"

EXTRA_COMPONENT_NAME Added in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_COMPONENT_NAME
```

Intent extra: A [ComponentName](#) (/reference/android/content/ComponentName) value.

Type: String

Constant Value: "android.intent.extra.COMPONENT_NAME"

EXTRA_CONTENT_ANNOTATIONS Added in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CONTENT_ANNOTATIONS
```

An **ArrayList** of **String** annotations describing content for **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER).

If **EXTRA_CONTENT_ANNOTATIONS** (/reference/android/content/Intent#EXTRA_CONTENT_ANNOTATIONS) is present in an intent used to start a **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER) activity, the first three annotations will be used to rank apps.

Annotations should describe the major components or topics of the content. It is up to apps initiating **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER) to learn and add annotations. Annotations should be learned in advance, e.g., when creating or saving content, to avoid increasing latency to start **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER). Names of customized annotations should not contain the colon character. Performance on customized annotations can suffer, if they are rarely used for **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER) in the past 14 days. Therefore, it is recommended to use the following annotations when applicable.

- "product" represents that the topic of the content is mainly about products, e.g., health & beauty, and office supplies.
- "emotion" represents that the topic of the content is mainly about emotions, e.g., happy, and sad.
- "person" represents that the topic of the content is mainly about persons, e.g., face, finger, standing, and walking.
- "child" represents that the topic of the content is mainly about children, e.g., child, and baby.
- "selfie" represents that the topic of the content is mainly about selfies.
- "crowd" represents that the topic of the content is mainly about crowds.
- "party" represents that the topic of the content is mainly about parties.
- "animal" represent that the topic of the content is mainly about animals.
- "plant" represents that the topic of the content is mainly about plants, e.g., flowers.
- "vacation" represents that the topic of the content is mainly about vacations.

- "fashion" represents that the topic of the content is mainly about fashion, e.g. sunglasses, jewelry, handbags and clothing.
- "material" represents that the topic of the content is mainly about materials, e.g., paper, and silk.
- "vehicle" represents that the topic of the content is mainly about vehicles, like cars, and boats.
- "document" represents that the topic of the content is mainly about documents, e.g. posters.
- "design" represents that the topic of the content is mainly about design, e.g. arts and designs of houses.
- "holiday" represents that the topic of the content is mainly about holidays, e.g., Christmas and Thanksgiving.

Constant Value: "android.intent.extra.CONTENT_ANNOTATIONS"

EXTRA_CONTENT_QUERY

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_CONTENT_QUERY
```

Optional CharSequence extra to provide a search query. The format of this query is dependent on the receiving application.

Applicable to [Intent](#) (/reference/android/content/Intent) with actions:

- [Intent#ACTION_GET_CONTENT](#) (/reference/android/content/Intent#ACTION_GET_CONTENT)
- [Intent#ACTION_OPEN_DOCUMENT](#) (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT)

Constant Value: "android.intent.extra.CONTENT_QUERY"

EXTRA_DATA_REMOVED

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_DATA_REMOVED
```

Used as a boolean extra field in [ACTION_PACKAGE_REMOVED](#) (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) intents to indicate whether this represents a full uninstall (removing both the code and its data) or a partial uninstall (leaving its data, implying that this is an update).

Constant Value: "android.intent.extra.DATA_REMOVED"

EXTRA_DOCK_STATE

Added in [API level 5](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_DOCK_STATE
```

Used as an int extra field in [ACTION_DOCK_EVENT](#) (/reference/android/content/Intent#ACTION_DOCK_EVENT) intents to request the dock state. Possible values are [EXTRA_DOCK_STATE_UNDOCKED](#) (/reference/android/content/Intent#EXTRA_DOCK_STATE_UNDOCKED), [EXTRA_DOCK_STATE_DESK](#) (/reference/android/content/Intent#EXTRA_DOCK_STATE_DESK), or [EXTRA_DOCK_STATE_CAR](#) (/reference/android/content/Intent#EXTRA_DOCK_STATE_CAR), or [EXTRA_DOCK_STATE_LE_DESK](#) (/reference/android/content/Intent#EXTRA_DOCK_STATE_LE_DESK), or [EXTRA_DOCK_STATE_HE_DESK](#) (/reference/android/content/Intent#EXTRA_DOCK_STATE_HE_DESK).

Constant Value: "android.intent.extra.DOCK_STATE"

EXTRA_DOCK_STATE_CAR

Added in [API level 5](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int EXTRA_DOCK_STATE_CAR
```

Used as an int value for [EXTRA_DOCK_STATE](/reference/android/content/Intent#EXTRA_DOCK_STATE) (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is in a car dock.

Constant Value: 2 (0x00000002)

EXTRA_DOCK_STATE_DESK

Added in [API level 5](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int EXTRA_DOCK_STATE_DESK
```

Used as an int value for [EXTRA_DOCK_STATE](/reference/android/content/Intent#EXTRA_DOCK_STATE) (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is in a desk dock.

Constant Value: 1 (0x00000001)

EXTRA_DOCK_STATE_HE_DESK

Added in [API level 11](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int EXTRA_DOCK_STATE_HE_DESK
```

Used as an int value for [EXTRA_DOCK_STATE](/reference/android/content/Intent#EXTRA_DOCK_STATE) (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is in a digital (high end) dock.

Constant Value: 4 (0x00000004)

EXTRA_DOCK_STATE_LE_DESK

Added in [API level 11](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int EXTRA_DOCK_STATE_LE_DESK
```

Used as an int value for [EXTRA_DOCK_STATE](/reference/android/content/Intent#EXTRA_DOCK_STATE) (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is in a analog (low end) dock.

Constant Value: 3 (0x00000003)

EXTRA_DOCK_STATE_UNDOCKED

Added in [API level 5](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int EXTRA_DOCK_STATE_UNDOCKED
```

Used as an int value for [EXTRA_DOCK_STATE](/reference/android/content/Intent#EXTRA_DOCK_STATE) (/reference/android/content/Intent#EXTRA_DOCK_STATE) to represent that the phone is not in any dock.

Constant Value: 0 (0x00000000)

EXTRA_DONT_KILL_APP

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_DONT_KILL_APP
```

Used as a boolean extra field in [ACTION_PACKAGE_REMOVED](/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) or [ACTION_PACKAGE_CHANGED](/reference/android/content/Intent#ACTION_PACKAGE_CHANGED) (/reference/android/content/Intent#ACTION_PACKAGE_CHANGED) intents to override the default action of restarting the application.

Constant Value: "android.intent.extra.DONT_KILL_APP"

EXTRA_DURATION_MILLIS

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_DURATION_MILLIS
```

Intent extra: The number of milliseconds.

Type: long

Constant Value: "android.intent.extra.DURATION_MILLIS"

EXTRA_EMAIL

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_EMAIL
```

A `String[]` holding e-mail addresses that should be delivered to.

Constant Value: "android.intent.extra.EMAIL"

EXTRA_EXCLUDE_COMPONENTS

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_EXCLUDE_COMPONENTS
```

A [ComponentName](#) (/reference/android/content/ComponentName) describing components that should be filtered out and omitted from a list of components presented to the user.

When used with [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER), the chooser will omit any of the components in this array if it otherwise would have shown them. Useful for omitting specific targets from your own package or other apps from your organization if the idea of sending to those targets would be redundant with other app functionality. Filtered components will not be able to present targets from an associated `ChooserTargetService`.

Constant Value: "android.intent.extra.EXCLUDE_COMPONENTS"

EXTRA_FROM_STORAGE

Added in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_FROM_STORAGE
```

Extra that can be included on activity intents coming from the storage UI when it launches sub-activities to manage various types of storage. For example, it may use [ACTION_VIEW](#) (/reference/android/content/Intent#ACTION_VIEW) with a "image/*" MIME type to have an app show the images on the device, and in that case also include this extra to tell the app it is coming from the storage UI so should help the user manage storage of this type.

Constant Value: "android.intent.extra.FROM_STORAGE"

EXTRA_HTML_TEXT

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_HTML_TEXT
```

A constant String that is associated with the Intent, used with [ACTION_SEND](#) (/reference/android/content/Intent#ACTION_SEND) to supply an alternative to [EXTRA_TEXT](#) (/reference/android/content/Intent#EXTRA_TEXT) as HTML formatted text. Note that you *must* also supply [EXTRA_TEXT](#) (/reference/android/content/Intent#EXTRA_TEXT).

Constant Value: "android.intent.extra.HTML_TEXT"

EXTRA_INDEX

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_INDEX
```

Optional index with semantics depending on the intent action.

The value must be an integer greater or equal to 0.

See also:

[ACTION_QUICK_VIEW](#) (/reference/android/content/Intent#ACTION_QUICK_VIEW)

Constant Value: "android.intent.extra.INDEX"

EXTRA_INITIAL_INTENTS

Added in [API level 5](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_INITIAL_INTENTS
```

A [Parcelable\[\]](#) of [Intent](#) (/reference/android/content/Intent) or [LabeledIntent](#) (/reference/android/content/pm/LabeledIntent) objects as set with `putExtra(java.lang.String, android.os.Parcelable[.])`.

(/reference/android/content/Intent#putExtra([java.lang.String](#),%20[android.os.Parcelable](#)[.])) of additional activities to place a the front of the list of choices, when shown to the user with a [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER).

Constant Value: "android.intent.extra.INITIAL_INTENTS"

EXTRA_INSTALLER_PACKAGE_NAME

Added in [API level 14](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_INSTALLER_PACKAGE_NAME
```

Used as a string extra field with [ACTION_INSTALL_PACKAGE](#) (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) to install a package. Specifies the installer package name; this package will receive the [ACTION_APP_ERROR](#) (/reference/android/content/Intent#ACTION_APP_ERROR) intent.

Constant Value: "android.intent.extra.INSTALLER_PACKAGE_NAME"

EXTRA_INTENT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_INTENT
```

An Intent describing the choices you would like shown with [ACTION_PICK_ACTIVITY](#) (/reference/android/content/Intent#ACTION_PICK_ACTIVITY) or [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER).

Constant Value: "android.intent.extra.INTENT"

EXTRA_KEY_EVENT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_KEY_EVENT
```

A [KeyEvent](#) (/reference/android/view/KeyEvent) object containing the event that triggered the creation of the Intent it is in.

Constant Value: "android.intent.extra.KEY_EVENT"

EXTRA_LOCAL_ONLY

Added in [API level 11](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_LOCAL_ONLY
```

Extra used to indicate that an intent should only return data that is on the local device. This is a boolean extra; the default is false. If true, an implementation should only allow the user to select data that is already on the device, not requiring it be downloaded from a remote service when opened.

See also:

[ACTION_GET_CONTENT](#) (/reference/android/content/Intent#ACTION_GET_CONTENT)

[ACTION_OPEN_DOCUMENT](#) (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT)

[ACTION_OPEN_DOCUMENT_TREE](#) (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT_TREE)

[ACTION_CREATE_DOCUMENT](#) (/reference/android/content/Intent#ACTION_CREATE_DOCUMENT)

Constant Value: "android.intent.extra.LOCAL_ONLY"

EXTRA_LOCUS_ID

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_LOCUS_ID
```

Intent extra: ID of the context used on [ACTION_VIEW_LOCUS](#) (/reference/android/content/Intent#ACTION_VIEW_LOCUS).

Type: LocusId (/reference/android/content/LocusId)

Constant Value: "android.intent.extra.LOCUS_ID"

EXTRA_MIME_TYPES

Added in API level 19 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_MIME_TYPES
```

Extra used to communicate a set of acceptable MIME types. The type of the extra is `String[]`. Values may be a combination of concrete MIME types (such as "image/png") and/or partial MIME types (such as "audio/*").

See also:

ACTION_GET_CONTENT (/reference/android/content/Intent#ACTION_GET_CONTENT)

ACTION_OPEN_DOCUMENT (/reference/android/content/Intent#ACTION_OPEN_DOCUMENT)

Constant Value: "android.intent.extra.MIME_TYPES"

EXTRA_NOT_UNKNOWN_SOURCE

Added in API level 14 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_NOT_UNKNOWN_SOURCE
```

Used as a boolean extra field with ACTION_INSTALL_PACKAGE (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) to install a package. Specifies that the application being installed should not be treated as coming from an unknown source, but as coming from the app invoking the Intent. For this to work you must start the installer with `startActivityForResult()`.

Constant Value: "android.intent.extra.NOT_UNKNOWN_SOURCE"

EXTRA_ORIGINATING_URI

Added in [API level 17](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_ORIGINATING_URI
```

Used as a URI extra field with [ACTION_INSTALL_PACKAGE](#) (/reference/android/content/Intent#ACTION_INSTALL_PACKAGE) and [ACTION_VIEW](#) (/reference/android/content/Intent#ACTION_VIEW) to indicate the URI from which the local APK in the Intent data field originated from.

Constant Value: "android.intent.extra.ORIGINATING_URI"

EXTRA_PACKAGE_NAME

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_PACKAGE_NAME
```

Intent extra: An app package name.

Type: String

Constant Value: "android.intent.extra.PACKAGE_NAME"

EXTRA_PHONE_NUMBER

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_PHONE_NUMBER
```

A String holding the phone number originally entered in [ACTION_NEW_OUTGOING_CALL](#) (/reference/android/content/Intent#ACTION_NEW_OUTGOING_CALL), or the actual number to call in a [ACTION_CALL](#) (/reference/android/content/Intent#ACTION_CALL).

Constant Value: "android.intent.extra.PHONE_NUMBER"

EXTRA_PROCESS_TEXT

Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_PROCESS_TEXT
```

The name of the extra used to define the text to be processed, as a CharSequence. Note that this may be a styled CharSequence, so you must use [Bundle#getCharSequence\(String\)](#) (/reference/android/os/Bundle#getCharSequence(java.lang.String)) to retrieve it.

Constant Value: "android.intent.extra.PROCESS_TEXT"

EXTRA_PROCESS_TEXT_READONLY

Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_PROCESS_TEXT_READONLY
```

The name of the boolean extra used to define if the processed text will be used as read-only.

Constant Value: "android.intent.extra.PROCESS_TEXT_READONLY"

EXTRA_QUICK_VIEW_FEATURES

Added in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_QUICK_VIEW_FEATURES
```

An optional extra of `String[]` indicating which quick view features should be made available to the user in the quick view UI while handing a [Intent#ACTION_QUICK_VIEW](#) (/reference/android/content/Intent#ACTION_QUICK_VIEW) intent.

- Enumeration of features here is not meant to restrict capabilities of the quick viewer. Quick viewer can implement features not listed below.
- Features included at this time are: [QuickViewConstants#FEATURE_VIEW](#) (/reference/android/content/QuickViewConstants#FEATURE_VIEW), [QuickViewConstants#FEATURE_EDIT](#) (/reference/android/content/QuickViewConstants#FEATURE_EDIT), [QuickViewConstants#FEATURE_DELETE](#) (/reference/android/content/QuickViewConstants#FEATURE_DELETE), [QuickViewConstants#FEATURE_DOWNLOAD](#) (/reference/android/content/QuickViewConstants#FEATURE_DOWNLOAD), [QuickViewConstants#FEATURE_SEND](#) (/reference/android/content/QuickViewConstants#FEATURE_SEND), [QuickViewConstants#FEATURE_PRINT](#) (/reference/android/content/QuickViewConstants#FEATURE_PRINT).

Requirements:

- Quick viewer shouldn't show a feature if the feature is absent in [EXTRA_QUICK_VIEW_FEATURES](#) (/reference/android/content/Intent#EXTRA_QUICK_VIEW_FEATURES).
- When [EXTRA_QUICK_VIEW_FEATURES](#) (/reference/android/content/Intent#EXTRA_QUICK_VIEW_FEATURES) is not present, quick viewer should follow internal policies.
- Presence of an feature in [EXTRA_QUICK_VIEW_FEATURES](#) (/reference/android/content/Intent#EXTRA_QUICK_VIEW_FEATURES), does not constitute a requirement that the feature be shown. Quick viewer may, according to its own policies, disable or hide features.

See also:

[ACTION_QUICK_VIEW](#) (/reference/android/content/Intent#ACTION_QUICK_VIEW)

Constant Value: "android.intent.extra.QUICK_VIEW_FEATURES"

EXTRA_QUIET_MODE

Added in [API level 24](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_QUIET_MODE
```

Optional boolean extra indicating whether quiet mode has been switched on or off. When a profile goes into quiet mode, all apps in the profile are killed and the profile user is stopped. Widgets originating from the profile are masked, and app launcher icons are grayed out.

Constant Value: "android.intent.extra.QUIET_MODE"

EXTRA_REFERRER

Added in [API level 17](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_REFERRER
```

This extra can be used with any Intent used to launch an activity, supplying information about who is launching that activity. This field contains a [Uri](#) (/reference/android/net/Uri) object, typically an http: or https: URI of the web site that the referral came from; it can also use the [android-app:](#) (/reference/android/content/Intent#URI_ANDROID_APP_SCHEME) scheme to identify a native application that it came from.

To retrieve this value in a client, use [Activity.getReferrer\(\)](#) (/reference/android/app/Activity#getReferrer()) instead of directly retrieving the extra. It is also valid for applications to instead supply [EXTRA_REFERRER_NAME](#) (/reference/android/content/Intent#EXTRA_REFERRER_NAME) for cases where they can only create a string, not a Uri; the field here, if supplied, will always take precedence, however.

See also:

[EXTRA_REFERRER_NAME](/reference/android/content/Intent#EXTRA_REFERRER_NAME) (/reference/android/content/Intent#EXTRA_REFERRER_NAME)

Constant Value: "android.intent.extra.REFERRER"

EXTRA_REFERRER_NAME

Added in [API level 22](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String EXTRA_REFERRER_NAME
```

Alternate version of [EXTRA_REFERRER](/reference/android/content/Intent#EXTRA_REFERRER) (/reference/android/content/Intent#EXTRA_REFERRER) that supplies the URI as a String rather than a [Uri](/reference/android/net/Uri) (/reference/android/net/Uri) object. Only for use in cases where Uri objects can not be created, in particular when Intent extras are supplied through the [**intent:**](/reference/android/content/Intent#URI_INTENT_SCHEME) (/reference/android/content/Intent#URI_INTENT_SCHEME) or [**android-app:**](/reference/android/content/Intent#URI_ANDROID_APP_SCHEME) (/reference/android/content/Intent#URI_ANDROID_APP_SCHEME) schemes.

See also:

[EXTRA_REFERRER](/reference/android/content/Intent#EXTRA_REFERRER) (/reference/android/content/Intent#EXTRA_REFERRER)

Constant Value: "android.intent.extra.REFERRER_NAME"

EXTRA_REMOTE_INTENT_TOKEN

Added in [API level 5](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String EXTRA_REMOTE_INTENT_TOKEN
```

Used in the extra field in the remote intent. It's a string token passed with the remote intent.

Constant Value: "android.intent.extra.remote_intent_token"

EXTRA_REPLACEMENT_EXTRAS

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_REPLACEMENT_EXTRAS
```

A Bundle forming a mapping of potential target package names to different extras Bundles to add to the default intent extras in [EXTRA_INTENT](#) (/reference/android/content/Intent#EXTRA_INTENT) when used with [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER). Each key should be a package name. The package need not be currently installed on the device.

An application may choose to provide alternate extras for the case where a user selects an activity from a predetermined set of target packages. If the activity the user selects from the chooser belongs to a package with its package name as a key in this bundle, the corresponding extras for that package will be merged with the extras already present in the intent at [EXTRA_INTENT](#) (/reference/android/content/Intent#EXTRA_INTENT). If a replacement extra has the same key as an extra already present in the intent it will overwrite the extra from the intent.

Examples:

- An application may offer different [EXTRA_TEXT](#) (/reference/android/content/Intent#EXTRA_TEXT) to an application when sharing with it via [ACTION_SEND](#) (/reference/android/content/Intent#ACTION_SEND), augmenting a link with additional query parameters for that target.
- An application may offer additional metadata for known targets of a given intent to pass along information only relevant to that target such as account or content identifiers already known to that application.

Constant Value: "android.intent.extra.REPLACEMENT_EXTRAS"

EXTRA_REPLACING

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_REPLACING
```

Used as a boolean extra field in [ACTION_PACKAGE_REMOVED](#) (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) intents to indicate that this is a replacement of the package, so this broadcast will immediately be followed by an add broadcast for a different version of the same package.

Constant Value: "android.intent.extra.REPLACING"

EXTRA_RESTRICTIONS_BUNDLE

Added in [API level 18](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_RESTRICTIONS_BUNDLE
```

Extra sent in the intent to the BroadcastReceiver that handles [ACTION_GET_RESTRICTION_ENTRIES](#) (/reference/android/content/Intent#ACTION_GET_RESTRICTION_ENTRIES). The type of the extra is a Bundle containing the restrictions as key/value pairs.

Constant Value: "android.intent.extra.restrictions_bundle"

EXTRA_RESTRICTIONS_INTENT

Added in [API level 18](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_RESTRICTIONS_INTENT
```

Extra used in the response from a BroadcastReceiver that handles [ACTION_GET_RESTRICTION_ENTRIES](#) (/reference/android/content/Intent#ACTION_GET_RESTRICTION_ENTRIES).

Constant Value: "android.intent.extra.restrictions_intent"

EXTRA_RESTRICTIONS_LIST

Added in [API level 18](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_RESTRICTIONS_LIST
```

Extra used in the response from a BroadcastReceiver that handles [ACTION_GET_RESTRICTION_ENTRIES](#) (/reference/android/content/Intent#ACTION_GET_RESTRICTION_ENTRIES). The type of the extra is `ArrayList<RestrictionEntry>`.

Constant Value: "android.intent.extra.restrictions_list"

EXTRA_RESULT_RECEIVER

Added in [API level 23](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_RESULT_RECEIVER
```

A [ResultReceiver](#) (/reference/android/os/ResultReceiver) used to return data back to the sender.

Used to complete an app-specific [refinement](#) (/reference/android/content/Intent#EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER) for [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER).

If [EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER](#) (/reference/android/content/Intent#EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER) is present in the intent used to start a [ACTION_CHOOSER](#) (/reference/android/content/Intent#ACTION_CHOOSER) activity this extra will be **filled in** (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to that [IntentSender](#)

([/reference/android/content/IntentSender](#)) and sent when the user selects a target component from the chooser. It is up to the recipient to send a result to this `ResultReceiver` to signal that disambiguation is complete and that the chooser should invoke the user's choice.

The disambiguator should provide a `Bundle` to the `ResultReceiver` with an intent assigned to the key `EXTRA_INTENT` ([/reference/android/content/Intent#EXTRA_INTENT](#)). This supplied intent will be used by the chooser to match and fill in the final `Intent` or `ChooserTarget` before starting it. The supplied intent must `match` ([/reference/android/content/Intent#filterEquals\(android.content.Intent\)](#)) one of the intents from `EXTRA_INTENT` ([/reference/android/content/Intent#EXTRA_INTENT](#)) or `EXTRA_ALTERNATE_INTENTS` ([/reference/android/content/Intent#EXTRA_ALTERNATE_INTENTS](#)) passed to `EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER` ([/reference/android/content/Intent#EXTRA_CHOOSER_REFINEMENT_INTENT_SENDER](#)) to be accepted.

The result code passed to the `ResultReceiver` should be `Activity.RESULT_OK` ([/reference/android/app/Activity#RESULT_OK](#)) if the refinement succeeded and the supplied intent's target in the chooser should be started, or `Activity.RESULT_CANCELED` ([/reference/android/app/Activity#RESULT_CANCELED](#)) if the chooser should finish without starting a target.

Constant Value: "android.intent.extra.RESULT_RECEIVER"

EXTRA_RETURN_RESULT

Added in [API level 14](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final String (/reference/java/lang/String) EXTRA_RETURN_RESULT
```

Used as a boolean extra field with `ACTION_INSTALL_PACKAGE` ([/reference/android/content/Intent#ACTION_INSTALL_PACKAGE](#)) or `ACTION_UNINSTALL_PACKAGE` ([/reference/android/content/Intent#ACTION_UNINSTALL_PACKAGE](#)). Specifies that the installer UI should return to the application the result code of the install/uninstall. The returned result code will be `Activity.RESULT_OK` ([/reference/android/app/Activity#RESULT_OK](#)) on success or `Activity.RESULT_FIRST_USER` ([/reference/android/app/Activity#RESULT_FIRST_USER](#)) on failure.

Constant Value: "android.intent.extra.RETURN_RESULT"

EXTRA_SHORTCUT_ICON

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_SHORTCUT_ICON
```

This constant was deprecated in API level 26.

Replaced with [ShortcutManager.createShortcutResultIntent\(ShortcutInfo\)](#).

(/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))

The name of the extra used to define the icon, as a Bitmap, of a shortcut.

See also:

[ACTION_CREATE_SHORTCUT](#) (/reference/android/content/Intent#ACTION_CREATE_SHORTCUT)

Constant Value: "android.intent.extra.shortcut.ICON"

EXTRA_SHORTCUT_ICON_RESOURCE

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_SHORTCUT_ICON_RESOURCE
```

This constant was deprecated in API level 26.

Replaced with [ShortcutManager.createShortcutResultIntent\(ShortcutInfo\)](#).

(/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))

The name of the extra used to define the icon, as a `ShortcutIconResource`, of a shortcut.

See also:

[ACTION_CREATE_SHORTCUT](/reference/android/content/Intent#ACTION_CREATE_SHORTCUT) (/reference/android/content/Intent#ACTION_CREATE_SHORTCUT)

[Intent.ShortcutIconResource](/reference/android/content/Intent.ShortcutIconResource) (/reference/android/content/Intent.ShortcutIconResource)

Constant Value: "android.intent.extra.shortcut.ICON_RESOURCE"

EXTRA_SHORTCUT_ID

Added in [API level 29](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String EXTRA_SHORTCUT_ID
```

Intent extra: ID of the shortcut used to send the share intent. Will be sent with [ACTION_SEND](/reference/android/content/Intent#ACTION_SEND) (/reference/android/content/Intent#ACTION_SEND).

See also:

Type: [String](/reference/java/lang/String)

(/reference/android/content/pm/ShortcutInfo#getId())

Constant Value: "android.intent.extra.shortcut.ID"

EXTRA_SHORTCUT_INTENT

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 26](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String EXTRA_SHORTCUT_INTENT
```


This constant was deprecated in API level 26.

Replaced with [ShortcutManager.createShortcutResultIntent\(ShortcutInfo\)](#).

(/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))

The name of the extra used to define the Intent of a shortcut.

See also:

[ACTION_CREATE_SHORTCUT](#) (/reference/android/content/Intent#ACTION_CREATE_SHORTCUT)

Constant Value: "android.intent.extra.shortcut.INTENT"

EXTRA_SHORTCUT_NAME

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 26](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_SHORTCUT_NAME
```

This constant was deprecated in API level 26.

Replaced with [ShortcutManager.createShortcutResultIntent\(ShortcutInfo\)](#).

(/reference/android/content/pm/ShortcutManager#createShortcutResultIntent(android.content.pm.ShortcutInfo))

The name of the extra used to define the name of a shortcut.

See also:

[ACTION_CREATE_SHORTCUT](#) (/reference/android/content/Intent#ACTION_CREATE_SHORTCUT)

Constant Value: "android.intent.extra.shortcut.NAME"

EXTRA_SHUTDOWN_USERSPACE_ONLY

Added in [API level 19](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_SHUTDOWN_USERSPACE_ONLY
```

Optional extra for [ACTION_SHUTDOWN](#) (/reference/android/content/Intent#ACTION_SHUTDOWN) that allows the sender to qualify that this shutdown is only for the user space of the system, not a complete shutdown. When this is true, hardware devices can use this information to determine that they shouldn't do a complete shutdown of their device since this is not a complete shutdown down to the kernel, but only user space restarting. The default if not supplied is false.

Constant Value: "android.intent.extra.SHUTDOWN_USERSPACE_ONLY"

EXTRA_SPLIT_NAME

Added in [API level 27](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_SPLIT_NAME
```

Intent extra: An app split name.

Type: String

Constant Value: "android.intent.extra.SPLIT_NAME"

EXTRA_STREAM

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_STREAM
```

A content: URI holding a stream of data associated with the Intent, used with [ACTION_SEND](#) (/reference/android/content/Intent#ACTION_SEND) to supply the data being sent.

Constant Value: "android.intent.extra.STREAM"

EXTRA_SUBJECT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_SUBJECT
```

A constant string holding the desired subject line of a message.

Constant Value: "android.intent.extra.SUBJECT"

EXTRA_SUSPENDED_PACKAGE_EXTRAS

Added in [API level 28](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_SUSPENDED_PACKAGE_EXTRAS
```

Intent extra: A [Bundle](#) (/reference/android/os/Bundle) of extras for a package being suspended. Will be sent as an extra with [ACTION_MY_PACKAGE_SUSPENDED](#) (/reference/android/content/Intent#ACTION_MY_PACKAGE_SUSPENDED).

The contents of this [Bundle](#) (/reference/android/os/Bundle) are a contract between the suspended app and the suspending app, i.e. any app with the permission `android.permission.SUSPEND_APPS`. This is meant to enable the suspended app to better handle the state of being suspended.

See also:

[ACTION_MY_PACKAGE_SUSPENDED](/reference/android/content/Intent#ACTION_MY_PACKAGE_SUSPENDED) (/reference/android/content/Intent#ACTION_MY_PACKAGE_SUSPENDED)

[ACTION_MY_PACKAGE_UNSPENDED](/reference/android/content/Intent#ACTION_MY_PACKAGE_UNSPENDED) (/reference/android/content/Intent#ACTION_MY_PACKAGE_UNSPENDED)

[PackageManager.isPackageSuspended\(\)](/reference/android/content/pm/PackageManager#isPackageSuspended()) (/reference/android/content/pm/PackageManager#isPackageSuspended())

[PackageManager.getSuspendedPackageAppExtras\(\)](/reference/android/content/pm/PackageManager#getSuspendedPackageAppExtras()) (/reference/android/content/pm/PackageManager#getSuspendedPackageAppExtras())

Constant Value: "android.intent.extra.SUSPENDED_PACKAGE_EXTRAS"

EXTRA_TEMPLATE

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String EXTRA_TEMPLATE
```

The initial data to place in a newly created record. Use with [ACTION_INSERT](/reference/android/content/Intent#ACTION_INSERT) (/reference/android/content/Intent#ACTION_INSERT). The data here is a Map containing the same fields as would be given to the underlying `ContentProvider.insert()` call.

Constant Value: "android.intent.extra.TEMPLATE"

EXTRA_TEXT

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String EXTRA_TEXT
```

A constant `CharSequence` that is associated with the Intent, used with [ACTION_SEND](/reference/android/content/Intent#ACTION_SEND) (/reference/android/content/Intent#ACTION_SEND) to supply the literal data to be sent. Note that this may be a styled `CharSequence`, so you must use [Bundle#getCharSequence\(String\)](#).

([/reference/android/os/Bundle#getCharSequence\(java.lang.String\)](#)) to retrieve it.

Constant Value: "android.intent.extra.TEXT"

EXTRA_TIME

Added in Android R ([/preview](#))

```
public static final String (/reference/java/lang/String) EXTRA_TIME
```

Optional extra specifying a time in milliseconds since the Epoch. The value must be non-negative.

Type: long

Constant Value: "android.intent.extra.TIME"

EXTRA_TITLE

Added in [API level 1](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final String (/reference/java/lang/String) EXTRA_TITLE
```

A CharSequence dialog title to provide to the user when used with a [ACTION_CHOOSER](#)

([/reference/android/content/Intent#ACTION_CHOOSER](#)).

Constant Value: "android.intent.extra.TITLE"

EXTRA_UID

Added in [API level 1](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final String (/reference/java/lang/String) EXTRA_UID
```

Used as an int extra field in [ACTION_UID_REMOVED](#) (/reference/android/content/Intent#ACTION_UID_REMOVED) intents to supply the uid the package had been assigned. Also an optional extra in [ACTION_PACKAGE_REMOVED](#) (/reference/android/content/Intent#ACTION_PACKAGE_REMOVED) or [ACTION_PACKAGE_CHANGED](#) (/reference/android/content/Intent#ACTION_PACKAGE_CHANGED) for the same purpose.

Constant Value: "android.intent.extra.UID"

EXTRA_USER

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final String (/reference/java/lang/String) EXTRA_USER
```

The UserHandle carried with intents.

Constant Value: "android.intent.extra.USER"

FILL_IN_ACTION

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_ACTION
```

Use with [fillIn\(Intent, int\)](#) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current action value to be overwritten, even if it is already set.

Constant Value: 1 (0x00000001)

FILL_IN_CATEGORIES

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_CATEGORIES
```

Use with [fillIn\(Intent, int\)](#) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current categories to be overwritten, even if they are already set.

Constant Value: 4 (0x00000004)

FILL_IN_CLIP_DATA

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_CLIP_DATA
```

Use with [fillIn\(Intent, int\)](#) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current ClipData to be overwritten, even if it is already set.

Constant Value: 128 (0x00000080)

FILL_IN_COMPONENT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_COMPONENT
```

Use with [fillIn\(Intent, int\)](#) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current component value to be overwritten, even if it is already set.

Constant Value: 8 (0x00000008)

FILL_IN_DATA

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_DATA
```

Use with [`fillIn\(Intent, int\)`](/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current data or type value overwritten, even if it is already set.

Constant Value: 2 (0x00000002)

FILL_IN_IDENTIFIER

Added in [API level 29](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_IDENTIFIER
```

Use with [`fillIn\(Intent, int\)`](/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) (/reference/android/content/Intent#fillIn(android.content.Intent,%20int)) to allow the current identifier value to be overwritten, even if it is already set.

Constant Value: 256 (0x00000100)

FILL_IN_PACKAGE

Added in [API level 4](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_PACKAGE
```


Use with `fillIn(Intent, int)` ([/reference/android/content/Intent#fillIn\(android.content.Intent,%20int\)](/reference/android/content/Intent#fillIn(android.content.Intent,%20int))) to allow the current package value to be overwritten, even if it is already set.

Constant Value: 16 (0x00000010)

FILL_IN_SELECTOR

Added in [API level 15](/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_SELECTOR
```

Use with `fillIn(Intent, int)` ([/reference/android/content/Intent#fillIn\(android.content.Intent,%20int\)](/reference/android/content/Intent#fillIn(android.content.Intent,%20int))) to allow the current selector to be overwritten, even if it is already set.

Constant Value: 64 (0x00000040)

FILL_IN_SOURCE_BOUNDS

Added in [API level 7](/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FILL_IN_SOURCE_BOUNDS
```

Use with `fillIn(Intent, int)` ([/reference/android/content/Intent#fillIn\(android.content.Intent,%20int\)](/reference/android/content/Intent#fillIn(android.content.Intent,%20int))) to allow the current bounds rectangle to be overwritten, even if it is already set.

Constant Value: 32 (0x00000020)

FLAG_ACTIVITY_BROUGHT_TO_FRONT

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_BROUGHT_TO_FRONT
```

This flag is not normally set by application code, but set for you by the system as described in the [launchMode](#) (/reference/android/R.styleable#AndroidManifestActivity_launchMode) documentation for the singleTask mode.

Constant Value: 4194304 (0x00400000)

FLAG_ACTIVITY_CLEAR_TASK

Added in [API level 11](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_CLEAR_TASK
```

If set in an Intent passed to [Context#startActivity](#) (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will cause any existing task that would be associated with the activity to be cleared before the activity is started. That is, the activity becomes the new root of an otherwise empty task, and any old activities are finished. This can only be used in conjunction with [FLAG_ACTIVITY_NEW_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK).

Constant Value: 32768 (0x00008000)

FLAG_ACTIVITY_CLEAR_TOP

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_CLEAR_TOP
```

If set, and the activity being launched is already running in the current task, then instead of launching a new instance of that activity, all of the other activities on top of it will be closed and this Intent will be delivered to the (now on top) old activity as a new Intent.

For example, consider a task consisting of the activities: A, B, C, D. If D calls `startActivity()` with an Intent that resolves to the component of activity B, then C and D will be finished and B receive the given Intent, resulting in the stack now being: A, B.

The currently running instance of activity B in the above example will either receive the new intent you are starting here in its `onNewIntent()` method, or be itself finished and restarted with the new intent. If it has declared its launch mode to be "multiple" (the default) and you have not set `FLAG_ACTIVITY_SINGLE_TOP` (/reference/android/content/Intent#FLAG_ACTIVITY_SINGLE_TOP) in the same intent, then it will be finished and re-created; for all other launch modes or if `FLAG_ACTIVITY_SINGLE_TOP` (/reference/android/content/Intent#FLAG_ACTIVITY_SINGLE_TOP) is set then this Intent will be delivered to the current instance's `onNewIntent()`.

This launch mode can also be used to good effect in conjunction with `FLAG_ACTIVITY_NEW_TASK` (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK): if used to start the root activity of a task, it will bring any currently running instance of that task to the foreground, and then clear it to its root state. This is especially useful, for example, when launching an activity from the notification manager.

See [Tasks and Back Stack](/guide/topics/fundamentals/tasks-and-back-stack) (</guide/topics/fundamentals/tasks-and-back-stack>) for more information about tasks.

Constant Value: 67108864 (0x04000000)

FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET

Added in [API level 3](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

Deprecated in [API level 21](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static final int FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET
```

This constant was deprecated in API level 21.

As of API 21 this performs identically to `FLAG_ACTIVITY_NEW_DOCUMENT` (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT) which should be used instead of this.

Constant Value: 524288 (0x00080000)

FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS
```

If set, the new activity is not kept in the list of recently launched activities.

Constant Value: 8388608 (0x00800000)

FLAG_ACTIVITY_FORWARD_RESULT

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_FORWARD_RESULT
```

If set and this intent is being used to launch a new activity from an existing one, then the reply target of the existing activity will be transferred to the new activity. This way, the new activity can call [Activity.setResult\(int\)](#)

(/reference/android/app/Activity#setResult(int)) and have that result sent back to the reply target of the original activity.

Constant Value: 33554432 (0x02000000)

FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY
```

This flag is not normally set by application code, but set for you by the system if this activity is being launched from history (longpress home key).

Constant Value: 1048576 (0x00100000)

FLAG_ACTIVITY_LAUNCH_ADJACENT

Added in [API level 24](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_LAUNCH_ADJACENT
```

This flag is only used in split-screen multi-window mode. The new activity will be displayed adjacent to the one launching it. This can only be used in conjunction with [FLAG_ACTIVITY_NEW_TASK](/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK). Also, setting [FLAG_ACTIVITY_MULTIPLE_TASK](/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK) (/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK) is required if you want a new instance of an existing activity to be created.

Constant Value: 4096 (0x00001000)

FLAG_ACTIVITY_MATCH_EXTERNAL

Added in [API level 28](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_MATCH_EXTERNAL
```

If set in an Intent passed to [Context#startActivity](/reference/android/content/Context#startActivity(android.content.Intent)) (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will attempt to launch an instant app if no full app on the device can already handle the intent.

When attempting to resolve instant apps externally, the following [Intent](/reference/android/content/Intent) (/reference/android/content/Intent) properties are supported:

- [Intent#setAction\(String\)](/reference/android/content/Intent#setAction(java.lang.String)) (/reference/android/content/Intent#setAction(java.lang.String))

- [Intent#addCategory\(String\)](/reference/android/content/Intent#addCategory(java.lang.String)) (/reference/android/content/Intent#addCategory(java.lang.String))
- [Intent#setData\(Uri\)](/reference/android/content/Intent#setData(android.net.Uri)) (/reference/android/content/Intent#setData(android.net.Uri))
- [Intent#setType\(String\)](/reference/android/content/Intent#setType(java.lang.String)) (/reference/android/content/Intent#setType(java.lang.String))
- [Intent#setPackage\(String\)](/reference/android/content/Intent#setPackage(java.lang.String)) (/reference/android/content/Intent#setPackage(java.lang.String))
- [Intent#addFlags\(int\)](/reference/android/content/Intent#addFlags(int)) (/reference/android/content/Intent#addFlags(int))

In the case that no instant app can be found, the installer will be launched to notify the user that the intent could not be resolved. On devices that do not support instant apps, the flag will be ignored.

Constant Value: 2048 (0x00000800)

FLAG_ACTIVITY_MULTIPLE_TASK

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_MULTIPLE_TASK
```

This flag is used to create a new task and launch an activity into it. This flag is always paired with either [FLAG_ACTIVITY_NEW_DOCUMENT](/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT) or [FLAG_ACTIVITY_NEW_TASK](/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK). In both cases these flags alone would search through existing tasks for ones matching this Intent. Only if no such task is found would a new task be created. When paired with [FLAG_ACTIVITY_MULTIPLE_TASK](/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK) both of these behaviors are modified to skip the search for a matching task and unconditionally start a new task. **When used with [FLAG_ACTIVITY_NEW_TASK](/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) do not use this flag unless you are implementing your own top-level application launcher.** Used in conjunction with [FLAG_ACTIVITY_NEW_TASK](/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) to disable the behavior of bringing an existing task to the foreground. When set, a new task is *always* started to host the Activity for the Intent, regardless of whether there is already an existing task running the same thing.

Because the default system does not include graphical task management, you should not use this flag unless you provide some way for a user to return back to the tasks you have launched. See [FLAG_ACTIVITY_NEW_DOCUMENT](#)

([/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT](#)) for details of this flag's use for creating new document tasks.

This flag is ignored if one of [FLAG_ACTIVITY_NEW_TASK](#) ([/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK](#)) or [FLAG_ACTIVITY_NEW_DOCUMENT](#) ([/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT](#)) is not also set.

See [Tasks and Back Stack](#) ([/guide/topics/fundamentals/tasks-and-back-stack](#)) for more information about tasks.

See also:

[FLAG_ACTIVITY_NEW_DOCUMENT](#) ([/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT](#))

[FLAG_ACTIVITY_NEW_TASK](#) ([/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK](#))

Constant Value: 134217728 (0x08000000)

FLAG_ACTIVITY_NEW_DOCUMENT

Added in [API level 21](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public static final int FLAG_ACTIVITY_NEW_DOCUMENT
```

This flag is used to open a document into a new task rooted at the activity launched by this Intent. Through the use of this flag, or its equivalent attribute, [R.attr.documentLaunchMode](#) ([/reference/android/R.attr#documentLaunchMode](#)) multiple instances of the same activity containing different documents will appear in the recent tasks list.

The use of the activity attribute form of this, [R.attr.documentLaunchMode](#) ([/reference/android/R.attr#documentLaunchMode](#)), is preferred over the Intent flag described here. The attribute form allows the Activity to specify multiple document behavior for all launchers of the Activity whereas using this flag requires each Intent that launches the Activity to specify it.

Note that the default semantics of this flag w.r.t. whether the recents entry for it is kept after the activity is finished is different than the use of [FLAG_ACTIVITY_NEW_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) and [R.attr.documentLaunchMode](#) (/reference/android/R.attr#documentLaunchMode) -- if this flag is being used to create a new recents entry, then by default that entry will be removed once the activity is finished. You can modify this behavior with [FLAG_ACTIVITY_RETAIN_IN_RECENTS](#) (/reference/android/content/Intent#FLAG_ACTIVITY_RETAIN_IN_RECENTS).

[FLAG_ACTIVITY_NEW_DOCUMENT](#) may be used in conjunction with [FLAG_ACTIVITY_MULTIPLE_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK). When used alone it is the equivalent of the Activity manifest specifying [R.attr.documentLaunchMode](#) (/reference/android/R.attr#documentLaunchMode)="intoExisting". When used with [FLAG_ACTIVITY_MULTIPLE_TASK](#) it is the equivalent of the Activity manifest specifying [R.attr.documentLaunchMode](#) (/reference/android/R.attr#documentLaunchMode)="always". Refer to [R.attr.documentLaunchMode](#) (/reference/android/R.attr#documentLaunchMode) for more information.

See also:

[R.attr.documentLaunchMode](#) (/reference/android/R.attr#documentLaunchMode)

[FLAG_ACTIVITY_MULTIPLE_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK)

Constant Value: 524288 (0x00080000)

FLAG_ACTIVITY_NEW_TASK

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_NEW_TASK
```

If set, this activity will become the start of a new task on this history stack. A task (from the activity that started it to the next task activity) defines an atomic group of activities that the user can move to. Tasks can be moved to the foreground and background; all

of the activities inside of a particular task always remain in the same order. See [Tasks and Back Stack](#) (/guide/topics/fundamentals/tasks-and-back-stack) for more information about tasks.

This flag is generally used by activities that want to present a "launcher" style behavior: they give the user a list of separate things that can be done, which otherwise run completely independently of the activity launching them.

When using this flag, if a task is already running for the activity you are now starting, then a new activity will not be started; instead, the current task will simply be brought to the front of the screen with the state it was last in. See [FLAG_ACTIVITY_MULTIPLE_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK) for a flag to disable this behavior.

This flag can not be used when the caller is requesting a result from the activity being launched.

Constant Value: 268435456 (0x10000000)

FLAG_ACTIVITY_NO_ANIMATION

Added in [API level 5](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_NO_ANIMATION
```

If set in an Intent passed to [Context#startActivity](#) (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will prevent the system from applying an activity transition animation to go to the next activity state. This doesn't mean an animation will never run – if another activity change happens that doesn't specify this flag before the activity started here is displayed, then that transition will be used. This flag can be put to good use when you are going to do a series of activity operations but the animation seen by the user shouldn't be driven by the first activity change but rather a later one.

Constant Value: 65536 (0x00010000)

FLAG_ACTIVITY_NO_HISTORY

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_NO_HISTORY
```

If set, the new activity is not kept in the history stack. As soon as the user navigates away from it, the activity is finished. This may also be set with the [noHistory](#) (/reference/android/R.styleable#AndroidManifestActivity_noHistory) attribute.

If set, [onActivityResult\(\)](#) (/reference/android/app/Activity#onActivityResult(int,%20int,%20android.content.Intent)) is never invoked when the current activity starts a new activity which sets a result and finishes.

Constant Value: 1073741824 (0x40000000)

FLAG_ACTIVITY_NO_USER_ACTION

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_NO_USER_ACTION
```

If set, this flag will prevent the normal [Activity.onUserLeaveHint\(\)](#) (/reference/android/app/Activity#onUserLeaveHint()) callback from occurring on the current frontmost activity before it is paused as the newly-started activity is brought to the front.

Typically, an activity can rely on that callback to indicate that an explicit user action has caused their activity to be moved out of the foreground. The callback marks an appropriate point in the activity's lifecycle for it to dismiss any notifications that it intends to display "until the user has seen them," such as a blinking LED.

If an activity is ever started via any non-user-driven events such as phone-call receipt or an alarm handler, this flag should be passed to [Context.startActivity\(\)](#) (/reference/android/content/Context#startActivity(android.content.Intent)), ensuring that the pausing activity does not think the user has acknowledged its notification.

Constant Value: 262144 (0x00040000)

FLAG_ACTIVITY_PREVIOUS_IS_TOP

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_PREVIOUS_IS_TOP
```

If set and this intent is being used to launch a new activity from an existing one, the current activity will not be counted as the top activity for deciding whether the new intent should be delivered to the top instead of starting a new one. The previous activity will be used as the top, with the assumption being that the current activity will finish itself immediately.

Constant Value: 16777216 (0x01000000)

FLAG_ACTIVITY_REORDER_TO_FRONT

Added in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_REORDER_TO_FRONT
```

If set in an Intent passed to [Context#startActivity](#) (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will cause the launched activity to be brought to the front of its task's history stack if it is already running.

For example, consider a task consisting of four activities: A, B, C, D. If D calls `startActivity()` with an Intent that resolves to the component of activity B, then B will be brought to the front of the history stack, with this resulting order: A, C, D, B. This flag will be ignored if [FLAG_ACTIVITY_CLEAR_TOP](#) (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TOP) is also specified.

Constant Value: 131072 (0x00020000)

FLAG_ACTIVITY_RESET_TASK_IF_NEEDED

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_RESET_TASK_IF_NEEDED
```

If set, and this activity is either being started in a new task or bringing to the top an existing task, then it will be launched as the front door of the task. This will result in the application of any affinities needed to have that task in the proper state (either moving activities to or from it), or simply resetting that task to its initial state if needed.

Constant Value: 2097152 (0x00200000)

FLAG_ACTIVITY_RETAIN_IN_RECENTS

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_RETAIN_IN_RECENTS
```

By default a document created by [FLAG_ACTIVITY_NEW_DOCUMENT](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT) will have its entry in recent tasks removed when the user closes it (with back or however else it may finish()). If you would like to instead allow the document to be kept in recents so that it can be re-launched, you can use this flag. When set and the task's activity is finished, the recents entry will remain in the interface for the user to re-launch it, like a recents entry for a top-level application.

The receiving activity can override this request with [R.attr.autoRemoveFromRecents](#)

(/reference/android/R.attr#autoRemoveFromRecents) or by explicitly calling [Activity.finishAndRemoveTask\(\)](#).

(/reference/android/app/Activity#finishAndRemoveTask()).

Constant Value: 8192 (0x00002000)

FLAG_ACTIVITY_SINGLE_TOP

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_SINGLE_TOP
```

If set, the activity will not be launched if it is already running at the top of the history stack.

Constant Value: 536870912 (0x20000000)

FLAG_ACTIVITY_TASK_ON_HOME

Added in [API level 11](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_ACTIVITY_TASK_ON_HOME
```

If set in an Intent passed to [Context#startActivity](#) (/reference/android/content/Context#startActivity(android.content.Intent)), this flag will cause a newly launching task to be placed on top of the current home activity task (if there is one). That is, pressing back from the task will always return the user to home even if that was not the last activity they saw. This can only be used in conjunction with [FLAG_ACTIVITY_NEW_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK).

Constant Value: 16384 (0x00004000)

FLAG_DEBUG_LOG_RESOLUTION

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_DEBUG_LOG_RESOLUTION
```

A flag you can enable for debugging: when set, log messages will be printed during the resolution of this intent to show you what has been found to create the final resolved list.

Constant Value: 8 (0x00000008)

FLAG_DIRECT_BOOT_AUTO

Added in [API level 29](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_DIRECT_BOOT_AUTO
```

Flag used to automatically match intents based on their Direct Boot awareness and the current user state.

Since the default behavior is to automatically apply the current user state, this is effectively a sentinel value that doesn't change the output of any queries based on its presence or absence.

Instead, this value can be useful in conjunction with [StrictMode.VmPolicy.Builder.detectImplicitDirectBoot\(\)](#) (/reference/android/os/StrictMode.VmPolicy.Builder#detectImplicitDirectBoot()) to detect when a caller is relying on implicit automatic matching, instead of confirming the explicit behavior they want.

Constant Value: 256 (0x00000100)

FLAG_EXCLUDE_STOPPED_PACKAGES

Added in [API level 12](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_EXCLUDE_STOPPED_PACKAGES
```

If set, this intent will not match any components in packages that are currently stopped. If this is not set, then the default behavior is to include such applications in the result.

Constant Value: 16 (0x00000010)

FLAG_FROM_BACKGROUND

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_FROM_BACKGROUND
```

Can be set by the caller to indicate that this Intent is coming from a background operation, not from direct user interaction.

Constant Value: 4 (0x00000004)

FLAG_GRANT_PERSISTABLE_URI_PERMISSION

Added in [API level 19](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_GRANT_PERSISTABLE_URI_PERMISSION
```

When combined with [FLAG_GRANT_READ_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) and/or [FLAG_GRANT_WRITE_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), the URI permission grant can be persisted across device reboots until explicitly revoked with [Context#revokeUriPermission\(Uri, int\)](#) (/reference/android/content/Context#revokeUriPermission(android.net.Uri,%20int)). This flag only offers the grant for possible persisting; the receiving application must call [ContentResolver#takePersistableUriPermission\(Uri, int\)](#) (/reference/android/content/ContentResolver#takePersistableUriPermission(android.net.Uri,%20int)) to actually persist.

See also:

[ContentResolver.takePersistableUriPermission\(Uri, int\)](#)

(/reference/android/content/ContentResolver#takePersistableUriPermission(android.net.Uri,%20int))

[ContentResolver.releasePersistableUriPermission\(Uri, int\)](#)

(/reference/android/content/ContentResolver#releasePersistableUriPermission(android.net.Uri,%20int))

[ContentResolver.getPersistedUriPermissions\(\)](#) (/reference/android/content/ContentResolver#getPersistedUriPermissions())

[ContentResolver.getOutgoingPersistedUriPermissions\(\)](#)

(/reference/android/content/ContentResolver#getOutgoingPersistedUriPermissions())

Constant Value: 64 (0x00000040)

FLAG_GRANT_PREFIX_URI_PERMISSION

Added in [API level 21](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_GRANT_PREFIX_URI_PERMISSION
```

When combined with [FLAG_GRANT_READ_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) and/or [FLAG_GRANT_WRITE_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), the URI permission grant applies to any URI that is a prefix match against the original granted URI. (Without this flag, the URI must match exactly for access to be granted.) Another URI is considered a prefix match only when scheme, authority, and all path segments defined by the prefix are an exact match.

Constant Value: 128 (0x00000080)

FLAG_GRANT_READ_URI_PERMISSION

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_GRANT_READ_URI_PERMISSION
```

If set, the recipient of this Intent will be granted permission to perform read operations on the URI in the Intent's data and any URIs specified in its ClipData. When applying to an Intent's ClipData, all URIs as well as recursive traversals through data or other ClipData in Intent items will be granted; only the grant flags of the top-level Intent are used.

Constant Value: 1 (0x00000001)

FLAG_GRANT_WRITE_URI_PERMISSION

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_GRANT_WRITE_URI_PERMISSION
```

If set, the recipient of this Intent will be granted permission to perform write operations on the URI in the Intent's data and any URIs specified in its ClipData. When applying to an Intent's ClipData, all URIs as well as recursive traversals through data or other ClipData in Intent items will be granted; only the grant flags of the top-level Intent are used.

Constant Value: 2 (0x00000002)

FLAG_INCLUDE_STOPPED_PACKAGES

Added in [API level 12](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_INCLUDE_STOPPED_PACKAGES
```

If set, this intent will always match any components in packages that are currently stopped. This is the default behavior when [FLAG_EXCLUDE_STOPPED_PACKAGES](#) (/reference/android/content/Intent#FLAG_EXCLUDE_STOPPED_PACKAGES) is not set. If both of these flags are set, this one wins (it allows overriding of exclude for places where the framework may automatically set the exclude flag).

Constant Value: 32 (0x00000020)

FLAG_RECEIVER_FOREGROUND

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_RECEIVER_FOREGROUND
```

If set, when sending a broadcast the recipient is allowed to run at foreground priority, with a shorter timeout interval. During normal broadcasts the receivers are not automatically hoisted out of the background priority class.

Constant Value: 268435456 (0x10000000)

FLAG_RECEIVER_NO_ABORT

Added in [API level 19](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_RECEIVER_NO_ABORT
```

If this is an ordered broadcast, don't allow receivers to abort the broadcast. They can still propagate results through to later receivers, but they can not prevent later receivers from seeing the broadcast.

Constant Value: 134217728 (0x08000000)

FLAG_RECEIVER_REGISTERED_ONLY

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_RECEIVER_REGISTERED_ONLY
```

If set, when sending a broadcast only registered receivers will be called -- no BroadcastReceiver components will be launched.

Constant Value: 1073741824 (0x40000000)

FLAG_RECEIVER_REPLACE_PENDING

Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int FLAG_RECEIVER_REPLACE_PENDING
```

If set, when sending a broadcast the new broadcast will replace any existing pending broadcast that matches it. Matching is defined by [Intent#filterEquals\(Intent\)](#) ([`/reference/android/content/Intent#filterEquals\(android.content.Intent\)`](/reference/android/content/Intent#filterEquals(android.content.Intent))) returning true for the intents of the two broadcasts. When a match is found, the new broadcast (and receivers associated with it) will replace the existing one in the pending broadcast list, remaining at the same position in the list.

This flag is most typically used with sticky broadcasts, which only care about delivering the most recent values of the broadcast to their receivers.

Constant Value: 536870912 (0x20000000)

FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS

Added in [API level 26](#) ([`/guide/topics/manifest/uses-sdk-element#ApiLevels`](/guide/topics/manifest/uses-sdk-element#ApiLevels))

```
public static final int FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS
```

If set, the broadcast will be visible to receivers in Instant Apps. By default Instant Apps will not receive broadcasts. *This flag has no effect when used by an Instant App.*

Constant Value: 2097152 (0x00200000)

METADATA_DOCK_HOME

Added in [API level 5](#) ([`/guide/topics/manifest/uses-sdk-element#ApiLevels`](/guide/topics/manifest/uses-sdk-element#ApiLevels))

```
public static final String (/reference/java/lang/String) METADATA_DOCK_HOME
```

Boolean that can be supplied as meta-data with a dock activity, to indicate that the dock should take over the home key when it is active.

Constant Value: "android.dock_home"

URI_ALLOW_UNSAFE

Added in [API level 22](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int URI_ALLOW_UNSAFE
```

Flag for use with [toUri\(int\)](#) (/reference/android/content/Intent#toUri(int)) and [parseUri\(String, int\)](#)

(/reference/android/content/Intent#parseUri(java.lang.String,%20int)): allow parsing of unsafe information. In particular, the flags

[FLAG_GRANT_READ_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION),

[FLAG_GRANT_WRITE_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION),

[FLAG_GRANT_PERSISTABLE_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION), and

[FLAG_GRANT_PREFIX_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_PREFIX_URI_PERMISSION) flags can not be set, so that the generated Intent can not cause unexpected data access to happen.

If you do not trust the source of the URI being parsed, you should still do further processing to protect yourself from it. In particular, when using it to start an activity you should usually add in [CATEGORY_BROWSABLE](#)

(/reference/android/content/Intent#CATEGORY_BROWSABLE) to limit the activities that can handle it.

Constant Value: 4 (0x00000004)

URI_ANDROID_APP_SCHEME

Added in [API level 22](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int URI_ANDROID_APP_SCHEME
```

Flag for use with `toUri(int)` ([/reference/android/content/Intent#toUri\(int\)](/reference/android/content/Intent#toUri(int))) and `parseUri(String, int)` ([/reference/android/content/Intent#parseUri\(java.lang.String,%20int\)](/reference/android/content/Intent#parseUri(java.lang.String,%20int))): the URI string always has the "android-app:" scheme. This is a variation of `URI_INTENT_SCHEME` (/reference/android/content/Intent#URI_INTENT_SCHEME) whose format is simpler for the case of an http/https URI being delivered to a specific package name. The format is:

```
android-app://{package_id}[/{scheme}[/{host}[/{path}]]][#Intent;{...}]
```

In this scheme, only the `package_id` is required. If you include a host, you must also include a scheme; including a path also requires both a host and a scheme. The final `#Intent;` fragment can be used without a scheme, host, or path. Note that this can not be used with intents that have a `setSelector(Intent)` ([/reference/android/content/Intent#setSelector\(android.content.Intent\)](/reference/android/content/Intent#setSelector(android.content.Intent))), since the base intent will always have an explicit package name.

Some examples of how this scheme maps to Intent objects:

URI	Intent
<code>android-app://com.example.app</code>	Action: <code>ACTION_MAIN</code> (/reference/android/content/Intent#ACTION_MAIN) Package: <code>com.example.app</code>
<code>android-app://com.example.app/http/example.com</code>	Action: <code>ACTION_VIEW</code> (/reference/android/content/Intent#ACTION_VIEW) Data: <code>http://example.com/</code> Package: <code>com.example.app</code>

URI	Intent
<code>android-app://com.example.app/http/example.com/foo?1234</code>	Action: <code><u>ACTION_VIEW</u></code> (/reference/android/content/Intent#ACTION_VIEW) Data: <code>http://example.com/foo?1234</code> Package: <code>com.example.app</code>
<code>android-app://com.example.app/ #Intent;action=com.example.MY_ACTION;end</code>	Action: <code>com.example.MY_ACTION</code> Package: <code>com.example.app</code>
<code>android-app://com.example.app/http/example.com/foo?1234 #Intent;action=com.example.MY_ACTION;end</code>	Action: <code>com.example.MY_ACTION</code> Data: <code>http://example.com/foo?1234</code> Package: <code>com.example.app</code>
<code>android-app://com.example.app/ #Intent;action=com.example.MY_ACTION; i.some_int=100;S.some_str=hello;end</code>	Action: <code>com.example.MY_ACTION</code> Package: <code>com.example.app</code> Extras: <code>some_int=(int)100 some_str=(String)hello</code>

Constant Value: 2 (0x00000002)

URI_INTENT_SCHEME

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final int URI_INTENT_SCHEME
```

Flag for use with [`toUri\(int\)`](/reference/android/content/Intent#toUri(int)) and [`parseUri\(String, int\)`](/reference/android/content/Intent#parseUri(String,int)).

([`parseUri\(java.lang.String,%20int\)`](/reference/android/content/Intent#parseUri(java.lang.String,%20int))): the URI string always has the "intent:" scheme. This syntax can be used when you want to later disambiguate between URIs that are intended to describe an Intent vs. all others that should be treated as raw URIs. When used with [`parseUri\(String, int\)`](/reference/android/content/Intent#parseUri(java.lang.String,%20int)), any other scheme will result in a generic VIEW action for that raw URI.

Constant Value: 1 (0x00000001)

Fields

CREATOR

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static final Creator<Intent> CREATOR
```

Public constructors

Intent

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent ()
```

Create an empty intent.

Intent

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (Intent (/reference/android/content/Intent) o)
```

Copy constructor.

Parameters

o **Intent**

Intent

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (String (/reference/java/lang/String) action)
```

Create an intent with a given action. All other fields (data, type, class) are null. Note that the action *must* be in a namespace because Intents are used globally in the system – for example the system VIEW action is android.intent.action.VIEW; an application's custom action would be something like com.google.app.myapp.CUSTOM_ACTION.

Parameters

action **String:** The Intent action, such as ACTION_VIEW.

Intent

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (String (/reference/java/lang/String) action,
              Uri (/reference/android/net/Uri) uri)
```

Create an intent with a given action and for a given data url. Note that the action *must* be in a namespace because Intents are used globally in the system -- for example the system VIEW action is android.intent.action.VIEW; an application's custom action would be something like com.google.app.myapp.CUSTOM_ACTION.

Note: scheme and host name matching in the Android framework is case-sensitive, unlike the formal RFC. As a result, you should always ensure that you write your Uri with these elements using lower case letters, and normalize any Uris you receive from outside of Android to ensure the scheme and host is lower case.

Parameters

action **String:** The Intent action, such as ACTION_VIEW.

uri **Uri:** The Intent data URI.

Intent

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (Context (/reference/android/content/Context) packageContext,
              Class (/reference/java/lang/Class)<?> cls)
```

Create an intent for a specific component. All other fields (action, data, type, class) are null, though they can be modified later with explicit calls. This provides a convenient way to create an intent that is intended to execute a hard-coded class name, rather than

relying on the system to find an appropriate class for you; see [setComponent\(ComponentName\)](#).

(/reference/android/content/Intent#setComponent(android.content.ComponentName)) for more information on the repercussions of this.

Parameters

packageContext **Context:** A Context of the application package implementing this class.

cls **Class:** The component class that is to be used for the intent.

See also:

[setClass\(Context, Class\)](#) (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>))

[setComponent\(ComponentName\)](#) (/reference/android/content/Intent#setComponent(android.content.ComponentName))

[Intent\(String, android.net.Uri, Context, Class\)](#)

(/reference/android/content/Intent#Intent(java.lang.String,%20android.net.Uri,%20android.content.Context,%20java.lang.Class<?>))

Intent

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (String (/reference/java/lang/String) action,  
              Uri (/reference/android/net/Uri) uri,  
              Context (/reference/android/content/Context) packageContext,  
              Class (/reference/java/lang/Class)<?> cls)
```

Create an intent for a specific component with a specified action and data. This is equivalent to using [Intent\(java.lang.String, android.net.Uri\)](#) (/reference/android/content/Intent#Intent(java.lang.String,%20android.net.Uri)) to construct the Intent and then calling [setClass\(Context, Class\)](#) (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>)) to set its class.

Note: scheme and host name matching in the Android framework is case-sensitive, unlike the formal RFC. As a result, you should always ensure that you write your Uri with these elements using lower case letters, and normalize any Uris you receive from outside of Android to ensure the scheme and host is lower case.

Parameters

action	String: The Intent action, such as ACTION_VIEW.
uri	Uri: The Intent data URI.
packageContext	Context: A Context of the application package implementing this class.
cls	Class: The component class that is to be used for the intent.

See also:

[Intent\(String, android.net.Uri\)](#) (/reference/android/content/Intent#Intent(java.lang.String,%20android.net.Uri))

[Intent\(Context, Class\)](#) (/reference/android/content/Intent#Intent(android.content.Context,%20java.lang.Class<?>))

[setClass\(Context, Class\)](#) (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>))

[setComponent\(ComponentName\)](#) (/reference/android/content/Intent#setComponent(android.content.ComponentName))

Public methods

addCategory

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) addCategory (String (/reference/java/lang/String) category)
```

Add a new category to the intent. Categories provide additional detail about the action the intent performs. When resolving an intent, only activities that provide *all* of the requested categories will be used.

Parameters

category **String:** The desired category. This can be either one of the predefined Intent categories, or a custom category in your own namespace.

Returns

Intent (/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.

See also:

hasCategory(String) (/reference/android/content/Intent#hasCategory(java.lang.String))

removeCategory(String) (/reference/android/content/Intent#removeCategory(java.lang.String))

addFlags

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) addFlags (int flags)
```

Add additional flags to the intent (or with existing flags value).

Parameters

flags

int: The new flags to set. Value is either **0** or a combination of **FLAG_GRANT_READ_URI_PERMISSION** ([/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION](#)), **FLAG_GRANT_WRITE_URI_PERMISSION** ([/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION](#)), **FLAG_FROM_BACKGROUND** ([/reference/android/content/Intent#FLAG_FROM_BACKGROUND](#)), **FLAG_DEBUG_LOG_RESOLUTION** ([/reference/android/content/Intent#FLAG_DEBUG_LOG_RESOLUTION](#)), **FLAG_EXCLUDE_STOPPED_PACKAGES** ([/reference/android/content/Intent#FLAG_EXCLUDE_STOPPED_PACKAGES](#)), **FLAG_INCLUDE_STOPPED_PACKAGES** ([/reference/android/content/Intent#FLAG_INCLUDE_STOPPED_PACKAGES](#)), **FLAG_GRANT_PERSISTABLE_URI_PERMISSION** ([/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION](#)), **FLAG_GRANT_PREFIX_URI_PERMISSION** ([/reference/android/content/Intent#FLAG_GRANT_PREFIX_URI_PERMISSION](#)), **android.content.Intent.FLAG_DEBUG_TRIAGED_MISSING**, **android.content.Intent.FLAG_IGNORE_EPHEMERAL**, **FLAG_ACTIVITY_MATCH_EXTERNAL** ([/reference/android/content/Intent#FLAG_ACTIVITY_MATCH_EXTERNAL](#)), **FLAG_ACTIVITY_NO_HISTORY** ([/reference/android/content/Intent#FLAG_ACTIVITY_NO_HISTORY](#)), **FLAG_ACTIVITY_SINGLE_TOP** ([/reference/android/content/Intent#FLAG_ACTIVITY_SINGLE_TOP](#)), **FLAG_ACTIVITY_NEW_TASK** ([/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK](#)), **FLAG_ACTIVITY_MULTIPLE_TASK** ([/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK](#)), **FLAG_ACTIVITY_CLEAR_TOP** ([/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TOP](#)), **FLAG_ACTIVITY_FORWARD_RESULT** ([/reference/android/content/Intent#FLAG_ACTIVITY_FORWARD_RESULT](#)), **FLAG_ACTIVITY_PREVIOUS_IS_TOP** ([/reference/android/content/Intent#FLAG_ACTIVITY_PREVIOUS_IS_TOP](#)), **FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS** ([/reference/android/content/Intent#FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS](#)), **FLAG_ACTIVITY_BROUGHT_TO_FRONT** ([/reference/android/content/Intent#FLAG_ACTIVITY_BROUGHT_TO_FRONT](#)), **FLAG_ACTIVITY_RESET_TASK_IF_NEEDED** ([/reference/android/content/Intent#FLAG_ACTIVITY_RESET_TASK_IF_NEEDED](#)), **FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY** ([/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY](#)), **FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET** ([/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET](#)), **FLAG_ACTIVITY_NEW_DOCUMENT** ([/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT](#)),

FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET

(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET),

FLAG_ACTIVITY_NO_USER_ACTION (/reference/android/content/Intent#FLAG_ACTIVITY_NO_USER_ACTION),

FLAG_ACTIVITY_REORDER_TO_FRONT (/reference/android/content/Intent#FLAG_ACTIVITY_REORDER_TO_FRONT)

, **FLAG_ACTIVITY_NO_ANIMATION** (/reference/android/content/Intent#FLAG_ACTIVITY_NO_ANIMATION),

FLAG_ACTIVITY_CLEAR_TASK (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TASK),

FLAG_ACTIVITY_TASK_ON_HOME (/reference/android/content/Intent#FLAG_ACTIVITY_TASK_ON_HOME),

FLAG_ACTIVITY_RETAIN_IN_RECENTS

(/reference/android/content/Intent#FLAG_ACTIVITY_RETAIN_IN_RECENTS), **FLAG_ACTIVITY_LAUNCH_ADJACENT**

(/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCH_ADJACENT), **FLAG_RECEIVER_REGISTERED_ONLY**

(/reference/android/content/Intent#FLAG_RECEIVER_REGISTERED_ONLY), **FLAG_RECEIVER_REPLACE_PENDING**

(/reference/android/content/Intent#FLAG_RECEIVER_REPLACE_PENDING), **FLAG_RECEIVER_FOREGROUND**

(/reference/android/content/Intent#FLAG_RECEIVER_FOREGROUND), **FLAG_RECEIVER_NO_ABORT**

(/reference/android/content/Intent#FLAG_RECEIVER_NO_ABORT),

android.content.Intent.FLAG_RECEIVER_REGISTERED_ONLY_BEFORE_BOOT,

android.content.Intent.FLAG_RECEIVER_BOOT_UPGRADE,

android.content.Intent.FLAG_RECEIVER_INCLUDE_BACKGROUND,

android.content.Intent.FLAG_RECEIVER_EXCLUDE_BACKGROUND,

android.content.Intent.FLAG_RECEIVER_FROM_SHELL, **FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS**

(/reference/android/content/Intent#FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS), and

android.content.Intent.FLAG_RECEIVER_OFFLOAD

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.

(/reference/android/content/Intent)

See also:

setFlags(int) (/reference/android/content/Intent#setFlags(int))

getFlags() (/reference/android/content/Intent#getFlags())

[removeFlags\(int\)](/reference/android/content/Intent#removeFlags(int)) (/reference/android/content/Intent#removeFlags(int))

clone

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Object clone ()
```

Creates and returns a copy of this object. The precise meaning of "copy" may depend on the class of the object. The general intent is that, for any object *x*, the expression:

```
x.clone() != x
```

will be true, and that the expression:

```
x.clone().getClass() == x.getClass()
```

will be true, but these are not absolute requirements. While it is typically the case that:

```
x.clone().equals(x)
```

will be true, this is not an absolute requirement.

By convention, the returned object should be obtained by calling `super.clone`. If a class and all of its superclasses (except `Object`) obey this convention, it will be the case that `x.clone().getClass() == x.getClass()`.

By convention, the object returned by this method should be independent of this object (which is being cloned). To achieve this independence, it may be necessary to modify one or more fields of the object returned by `super.clone` before returning it. Typically, this means copying any mutable objects that comprise the internal "deep structure" of the object being cloned and replacing the references to these objects with references to the copies. If a class contains only primitive fields or references to immutable objects, then it is usually the case that no fields in the object returned by `super.clone` need to be modified.

The method `clone` for class `Object` performs a specific cloning operation. First, if the class of this object does not implement the interface `Cloneable`, then a `CloneNotSupportedException` is thrown. Note that all arrays are considered to implement the interface `Cloneable` and that the return type of the `clone` method of an array type `T[]` is `T[]` where `T` is any reference or primitive type. Otherwise, this method creates a new instance of the class of this object and initializes all its fields with exactly the contents of the corresponding fields of this object, as if by assignment; the contents of the fields are not themselves cloned. Thus, this method performs a "shallow copy" of this object, not a "deep copy" operation.

The class `Object` does not itself implement the interface `Cloneable`, so calling the `clone` method on an object whose class is `Object` will result in throwing an exception at run time.

Returns

Object a clone of this instance.
(/reference/java/lang/Object)

cloneFilter

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) cloneFilter ()
```


Make a clone of only the parts of the Intent that are relevant for filter matching: the action, data, type, component, and categories.

Returns

Intent This value will never be `null`.
(/reference/android/content/Intent)

createChooser

Added in [API level 22](/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static Intent (/reference/android/content/Intent) createChooser (Intent (/reference/android/content/Intent) target,  
    CharSequence (/reference/java/lang/CharSequence) title,  
    IntentSender (/reference/android/content/IntentSender) sender)
```

Convenience function for creating a **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER) Intent.

Builds a new **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER) Intent that wraps the given target intent, also optionally supplying a title. If the target intent has specified **FLAG_GRANT_READ_URI_PERMISSION** (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) or **FLAG_GRANT_WRITE_URI_PERMISSION** (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), then these flags will also be set in the returned chooser intent, with its ClipData set appropriately: either a direct reflection of **getClipData()** (/reference/android/content/Intent#getClipData()) if that is non-null, or a new ClipData built from **getData()** (/reference/android/content/Intent#getData()).

The caller may optionally supply an **IntentSender** (/reference/android/content/IntentSender) to receive a callback when the user makes a choice. This can be useful if the calling application wants to remember the last chosen target and surface it as a more prominent or one-touch affordance elsewhere in the UI for next time.

Parameters

target	Intent: The Intent that the user will be selecting an activity to perform.
title	CharSequence: Optional title that will be displayed in the chooser, only when the target action is not ACTION_SEND or ACTION_SEND_MULTIPLE.
sender	IntentSender: Optional IntentSender to be called when a choice is made.

Returns

Intent Return a new Intent object that you can hand to **Context#startActivity(Intent)** ([/reference/android/content/Context#startActivity\(android.content.Intent\)](/reference/android/content/Context#startActivity(android.content.Intent))) and related methods. (</reference/android/content/Intent>)

createChooser

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static Intent (/reference/android/content/Intent) createChooser (Intent target,
    CharSequence title)
```

Convenience function for creating a **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER) Intent.

Builds a new **ACTION_CHOOSER** (/reference/android/content/Intent#ACTION_CHOOSER) Intent that wraps the given target intent, also optionally supplying a title. If the target intent has specified **FLAG_GRANT_READ_URI_PERMISSION** (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) or **FLAG_GRANT_WRITE_URI_PERMISSION** (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), then these flags will also be set in the returned chooser intent, with its ClipData set appropriately: either a direct reflection of **getClipData()** ([/reference/android/content/Intent#getClipData\(\)](/reference/android/content/Intent#getClipData())) if that is non-null, or a new ClipData built from **getData()** ([/reference/android/content/Intent#getData\(\)](/reference/android/content/Intent#getData())).

Parameters

target	Intent: The Intent that the user will be selecting an activity to perform.
title	CharSequence: Optional title that will be displayed in the chooser, only when the target action is not ACTION_SEND or ACTION_SEND_MULTIPLE.

Returns

Intent Return a new Intent object that you can hand to **`Context.startActivity(Intent)`** ([/reference/android/content/Context#startActivity\(android.content.Intent\)](/reference/android/content/Context#startActivity(android.content.Intent))) and related methods. (</reference/android/content/Intent>)

describeContents

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public int describeContents ()
```

Describe the kinds of special objects contained in this Parcelable instance's marshaled representation. For example, if the object will include a file descriptor in the output of **`writeToParcel(android.os.Parcel, int)`** ([/reference/android/os/Parcelable#writeToParcel\(android.os.Parcel,%20int\)](/reference/android/os/Parcelable#writeToParcel(android.os.Parcel,%20int))), the return value of this method must include the

`CONTENTS_FILE_DESCRIPTOR` (/reference/android/os/Parcelable#CONTENTS_FILE_DESCRIPTOR) bit.

Returns

int a bitmask indicating the set of special object types marshaled by this Parcelable object instance. Value is either **0** or **`CONTENTS_FILE_DESCRIPTOR`** (/reference/android/os/Parcelable#CONTENTS_FILE_DESCRIPTOR)

fillIn

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public int fillIn (Intent (/reference/android/content/Intent) other,  
                 int flags)
```

Copy the contents of **other** in to this object, but only where fields are not defined by this object. For purposes of a field being defined, the following pieces of data in the Intent are considered to be separate fields:

- action, as set by [setAction\(String\)](#) (/reference/android/content/Intent#setAction(java.lang.String)).
- data Uri and MIME type, as set by [setData\(android.net.Uri\)](#) (/reference/android/content/Intent#setData(android.net.Uri)), [setType\(java.lang.String\)](#) (/reference/android/content/Intent#setType(java.lang.String)), or [setDataAndType\(android.net.Uri, java.lang.String\)](#) (/reference/android/content/Intent#setDataAndType(android.net.Uri,%20java.lang.String)).
- identifier, as set by [setIdentifier\(String\)](#) (/reference/android/content/Intent#setIdentifier(java.lang.String)).
- categories, as set by [addCategory\(String\)](#) (/reference/android/content/Intent#addCategory(java.lang.String)).
- package, as set by [setPackage\(String\)](#) (/reference/android/content/Intent#setPackage(java.lang.String)).
- component, as set by [setComponent\(android.content.ComponentName\)](#) (/reference/android/content/Intent#setComponent(android.content.ComponentName)) or related methods.
- source bounds, as set by [setSourceBounds\(Rect\)](#) (/reference/android/content/Intent#setSourceBounds(android.graphics.Rect)).
- selector, as set by [setSelector\(android.content.Intent\)](#) (/reference/android/content/Intent#setSelector(android.content.Intent)).
- clip data, as set by [setClipData\(android.content.ClipData\)](#) (/reference/android/content/Intent#setClipData(android.content.ClipData)).

- each top-level name in the associated extras.

In addition, you can use the **FILL_IN_ACTION** (/reference/android/content/Intent#FILL_IN_ACTION), **FILL_IN_DATA** (/reference/android/content/Intent#FILL_IN_DATA), **FILL_IN_IDENTIFIER** (/reference/android/content/Intent#FILL_IN_IDENTIFIER), **FILL_IN_CATEGORIES** (/reference/android/content/Intent#FILL_IN_CATEGORIES), **FILL_IN_PACKAGE** (/reference/android/content/Intent#FILL_IN_PACKAGE), **FILL_IN_COMPONENT** (/reference/android/content/Intent#FILL_IN_COMPONENT), **FILL_IN_SOURCE_BOUNDS** (/reference/android/content/Intent#FILL_IN_SOURCE_BOUNDS), **FILL_IN_SELECTOR** (/reference/android/content/Intent#FILL_IN_SELECTOR), and **FILL_IN_CLIP_DATA** (/reference/android/content/Intent#FILL_IN_CLIP_DATA) to override the restriction where the corresponding field will not be replaced if it is already set.

Note: The component field will only be copied if **FILL_IN_COMPONENT** (/reference/android/content/Intent#FILL_IN_COMPONENT) is explicitly specified. The selector will only be copied if **FILL_IN_SELECTOR** (/reference/android/content/Intent#FILL_IN_SELECTOR) is explicitly specified.

For example, consider Intent A with {data="foo", categories="bar"} and Intent B with {action="gotit", data-type="some/thing", categories="one","two"}.

Calling A.fillIn(B, Intent.FILL_IN_DATA) will result in A now containing: {action="gotit", data-type="some/thing", categories="bar"}.

Parameters

other **Intent:** Another Intent whose values are to be used to fill in the current one. This value must never be `null`.

flags **int:** Options to control which fields can be filled in. Value is either `0` or a combination of **FILL_IN_ACTION** (/reference/android/content/Intent#FILL_IN_ACTION), **FILL_IN_DATA** (/reference/android/content/Intent#FILL_IN_DATA), **FILL_IN_CATEGORIES** (/reference/android/content/Intent#FILL_IN_CATEGORIES), **FILL_IN_COMPONENT** (/reference/android/content/Intent#FILL_IN_COMPONENT), **FILL_IN_PACKAGE** (/reference/android/content/Intent#FILL_IN_PACKAGE), **FILL_IN_SOURCE_BOUNDS** (/reference/android/content/Intent#FILL_IN_SOURCE_BOUNDS), **FILL_IN_SELECTOR**

(/reference/android/content/Intent#FILL_IN_SELECTOR), and **FILL_IN_CLIP_DATA**
 (/reference/android/content/Intent#FILL_IN_CLIP_DATA)

Returns

int Returns a bit mask of **FILL_IN_ACTION** (/reference/android/content/Intent#FILL_IN_ACTION), **FILL_IN_DATA** (/reference/android/content/Intent#FILL_IN_DATA), **FILL_IN_CATEGORIES** (/reference/android/content/Intent#FILL_IN_CATEGORIES), **FILL_IN_PACKAGE** (/reference/android/content/Intent#FILL_IN_PACKAGE), **FILL_IN_COMPONENT** (/reference/android/content/Intent#FILL_IN_COMPONENT), **FILL_IN_SOURCE_BOUNDS** (/reference/android/content/Intent#FILL_IN_SOURCE_BOUNDS), **FILL_IN_SELECTOR** (/reference/android/content/Intent#FILL_IN_SELECTOR) and **FILL_IN_CLIP_DATA** (/reference/android/content/Intent#FILL_IN_CLIP_DATA) indicating which fields were changed. Value is either 0 or a combination of **FILL_IN_ACTION** (/reference/android/content/Intent#FILL_IN_ACTION), **FILL_IN_DATA** (/reference/android/content/Intent#FILL_IN_DATA), **FILL_IN_CATEGORIES** (/reference/android/content/Intent#FILL_IN_CATEGORIES), **FILL_IN_COMPONENT** (/reference/android/content/Intent#FILL_IN_COMPONENT), **FILL_IN_PACKAGE** (/reference/android/content/Intent#FILL_IN_PACKAGE), **FILL_IN_SOURCE_BOUNDS** (/reference/android/content/Intent#FILL_IN_SOURCE_BOUNDS), **FILL_IN_SELECTOR** (/reference/android/content/Intent#FILL_IN_SELECTOR), and **FILL_IN_CLIP_DATA** (/reference/android/content/Intent#FILL_IN_CLIP_DATA)

filterEquals

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean filterEquals (Intent (/reference/android/content/Intent) other)
```

Determine if two intents are the same for the purposes of intent resolution (filtering). That is, if their action, data, type, identity, class, and categories are the same. This does *not* compare any extra data included in the intents. Note that technically when actually

matching against an [IntentFilter](/reference/android/content/IntentFilter) (/reference/android/content/IntentFilter) the identifier is ignored, while here it is directly compared for equality like the other fields.

Parameters

other **Intent:** The other Intent to compare against.

Returns

boolean Returns true if action, data, type, class, and categories are the same.

filterHashCode

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public int filterHashCode ()
```

Generate hash code that matches semantics of `filterEquals()`.

Returns

int Returns the hash value of the action, data, type, class, and categories.

See also:

[**filterEquals\(Intent\)**](/reference/android/content/Intent#filterEquals(android.content.Intent)) (/reference/android/content/Intent#filterEquals(android.content.Intent))

getAction

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String (/reference/java/lang/String) getAction ()
```

Retrieve the general action to be performed, such as [ACTION_VIEW](#) (/reference/android/content/Intent#ACTION_VIEW). The action describes the general way the rest of the information in the intent should be interpreted – most importantly, what to do with the data returned by [getData\(\)](#) (/reference/android/content/Intent#getData()).

Returns

String The action of this intent or null if none is specified.
(/reference/java/lang/String)

See also:

[setAction\(String\)](#) (/reference/android/content/Intent#setAction(java.lang.String))

getBooleanArrayExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean[] getBooleanArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

`boolean[]` the value of an item previously added with `putExtra()`, or null if no boolean array value was found.

See also:

[putExtra\(String, boolean\[\]\)](/reference/android/content/Intent#putExtra(java.lang.String,%20boolean[])) (/reference/android/content/Intent#putExtra(java.lang.String,%20boolean[]))

getBooleanExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean getBooleanExtra (String name,  
                               boolean defaultValue)
```

Retrieve extended data from the intent.

Parameters

name `String`: The name of the desired item.

defaultValue `boolean`: the value to be returned if no value of the desired type is stored with the given name.

Returns

`boolean` the value of an item previously added with `putExtra()`, or the default value if none was found.

See also:

putExtra(String, boolean) (/reference/android/content/Intent#putExtra(java.lang.String,%20boolean))

getBundleExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

public [Bundle](#) (/reference/android/os/Bundle) getBundleExtra ([String](#) (/reference/java/lang/String) name)

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

[Bundle](#) (/reference/android/os/Bundle) the value of an item previously added with `putExtra()`, or null if no Bundle value was found.

See also:

putExtra(String, Bundle) (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Bundle))

getByteArrayExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

public byte[] getByteArrayExtra ([String](#) (/reference/java/lang/String) name)

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

byte[] the value of an item previously added with `putExtra()`, or null if no byte array value was found.

See also:

[putExtra\(String, byte\[\]\)](/reference/android/content/Intent#putExtra(java.lang.String,%20byte[])) (/reference/android/content/Intent#putExtra(java.lang.String,%20byte[]))

getBytesExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public byte getBytesExtra (String name,  
                           byte defaultValue)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

defaultValue **byte:** the value to be returned if no value of the desired type is stored with the given name.

Returns

byte the value of an item previously added with `putExtra()`, or the default value if none was found.

See also:

[putExtra\(String, byte\)](/reference/android/content/Intent#putExtra(java.lang.String,%20byte)) (/reference/android/content/Intent#putExtra(java.lang.String,%20byte))

getCategories

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Set (<String> getCategories ()
```

Return the set of all categories in the intent. If there are no categories, returns NULL.

Returns

[Set](/reference/java/util/Set) (/reference/java/util/Set) The set of categories you can examine. Do not modify!

<[String](/reference/java/lang/String)
(/reference/java/lang/String)>

See also:

[hasCategory\(String\)](/reference/android/content/Intent#hasCategory(java.lang.String)) (/reference/android/content/Intent#hasCategory(java.lang.String))

[addCategory\(String\)](/reference/android/content/Intent#addCategory(java.lang.String)) (/reference/android/content/Intent#addCategory(java.lang.String))

getCharArrayExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public char[] getCharArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

char[] the value of an item previously added with `putExtra()`, or null if no char array value was found.

See also:

[putExtra\(\[String\]\(#\), \[char\\[\\]\]\(#\)\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20char[]))

getCharExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public char getCharExtra (String (/reference/java/lang/String) name,  
                          char defaultValue)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

defaultValue **char:** the value to be returned if no value of the desired type is stored with the given name.

Returns

char the value of an item previously added with `putExtra()`, or the default value if none was found.

See also:

[putExtra\(String, char\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20char))

getCharSequenceArrayExtra

Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

`public CharSequence\[\] (/reference/java/lang/CharSequence) getCharSequenceArrayExtra (String (/reference/java/lang/String) name)`

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

[CharSequence\[\]](#) the value of an item previously added with `putExtra()`, or null if no `CharSequence` array value was found.

(/reference/java/lang/CharSequence)
nce)

See also:

[putExtra\(String, CharSequence\[\]\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20java.lang.CharSequence[]))

getCharSequenceArrayListExtra

Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public ArrayList (/reference/java/util/ArrayList) <CharSequence (/reference/java/lang/CharSequence)> getCharSequenceArrayListExtra
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

[ArrayList](#) the value of an item previously added with [putCharSequenceArrayListExtra](#), or null if no [ArrayList](#) value was found.

(/reference/java/util/ArrayList)

<**[CharSequence](#)**

(/reference/java/lang/CharSequence)

nce)

>

See also:

putCharSequenceArrayListExtra(String, ArrayList)

(/reference/android/content/Intent#putCharSequenceArrayListExtra(java.lang.String,%20java.util.ArrayList<java.lang.CharSequence>))

getCharSequenceExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

public [CharSequence](#) (/reference/java/lang/CharSequence) getCharSequenceExtra ([String](#) (/reference/java/lang/String) name)

Retrieve extended data from the intent.

Parameters

name	String: The name of the desired item.
-------------	--

Returns

CharSequence (/reference/java/lang/CharSequence)	the value of an item previously added with <code>putExtra()</code> , or null if no <code>CharSequence</code> value was found.
--	---

See also:

[putExtra\(String, CharSequence\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20java.lang.CharSequence))

getClipData

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)


```
public ClipData (/reference/android/content/ClipData) getClipData ()
```

Return the [ClipData](#) (/reference/android/content/ClipData) associated with this Intent. If there is none, returns null. See [setClipData\(ClipData\)](#) (/reference/android/content/Intent#setClipData(android.content.ClipData)) for more information.

Returns

[ClipData](#)

(/reference/android/content/ClipData)

See also:

[setClipData\(ClipData\)](#) (/reference/android/content/Intent#setClipData(android.content.ClipData))

getComponent

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public ComponentName (/reference/android/content/ComponentName) getComponent ()
```

Retrieve the concrete component associated with the intent. When receiving an intent, this is the component that was found to best handle it (that is, yourself) and will always be non-null; in all other cases it will be null unless explicitly set.

Returns

[ComponentName](#)

The name of the application component to handle the intent.

(/reference/android/content/ComponentName)

See also:

[resolveActivity\(PackageManager\)](#) (/reference/android/content/Intent#resolveActivity(android.content.pm.PackageManager))

[setComponent\(ComponentName\)](#) (/reference/android/content/Intent#setComponent(android.content.ComponentName))

getData

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Uri (/reference/android/net/Uri) getData ()
```

Retrieve data this intent is operating on. This URI specifies the name of the data; often it uses the content: scheme, specifying data in a content provider. Other schemes may be handled by specific activities, such as http: by the web browser.

Returns

[Uri](#) (/reference/android/net/Uri) The URI of the data this intent is targeting or null.

See also:

[getScheme\(\)](#) (/reference/android/content/Intent#getScheme())

[setData\(Uri\)](#) (/reference/android/content/Intent#setData(android.net.Uri))

getDataString

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String (/reference/java/lang/String) getDataString ()
```

The same as [getData\(\)](#) (/reference/android/content/Intent#getData()), but returns the URI as an encoded String.

Returns

String This value may be `null`.
(/reference/java/lang/String)

getDoubleArrayExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public double[] getDoubleArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

double [] the value of an item previously added with `putExtra()`, or null if no double array value was found.

See also:

[putExtra\(String, double\[\]\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20double[]))

getDoubleExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public double getDoubleExtra (String (/reference/java/lang/String) name,  
                             double defaultValue)
```

Retrieve extended data from the intent.

Parameters

name	String : The name of the desired item.
defaultValue	double : the value to be returned if no value of the desired type is stored with the given name.

Returns

double	the value of an item previously added with <code>putExtra()</code> , or the default value if none was found.
---------------	--

See also:

[putExtra\(\[String\]\(#\), \[double\]\(#\)\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20double))

getExtras

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Bundle (/reference/android/os/Bundle) getExtras ()
```

Retrieves a map of extended data from the intent.

Returns

Bundle the map of all extras previously added with `putExtra()`, or null if none have been added.
(/reference/android/os/Bundle)

getFlags

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public int getFlags ()
```

Retrieve any special flags associated with this intent. You will normally just set them with `setFlags(int)`.
(/reference/android/content/Intent#setFlags(int)) and let the system take the appropriate action with them.

Returns

int The currently set flags. Value is either `0` or a combination of [FLAG_GRANT_READ_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION), [FLAG_GRANT_WRITE_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), [FLAG_FROM_BACKGROUND](/reference/android/content/Intent#FLAG_FROM_BACKGROUND) (/reference/android/content/Intent#FLAG_FROM_BACKGROUND), [FLAG_DEBUG_LOG_RESOLUTION](/reference/android/content/Intent#FLAG_DEBUG_LOG_RESOLUTION) (/reference/android/content/Intent#FLAG_DEBUG_LOG_RESOLUTION), [FLAG_EXCLUDE_STOPPED_PACKAGES](/reference/android/content/Intent#FLAG_EXCLUDE_STOPPED_PACKAGES) (/reference/android/content/Intent#FLAG_EXCLUDE_STOPPED_PACKAGES), [FLAG_INCLUDE_STOPPED_PACKAGES](/reference/android/content/Intent#FLAG_INCLUDE_STOPPED_PACKAGES) (/reference/android/content/Intent#FLAG_INCLUDE_STOPPED_PACKAGES), [FLAG_GRANT_PERSISTABLE_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION), [FLAG_GRANT_PREFIX_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_PREFIX_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_PREFIX_URI_PERMISSION), `android.content.Intent.FLAG_DEBUG_TRIAGED_MISSING`, `android.content.Intent.FLAG_IGNORE_EPHEMERAL`, [FLAG_ACTIVITY_MATCH_EXTERNAL](/reference/android/content/Intent#FLAG_ACTIVITY_MATCH_EXTERNAL) (/reference/android/content/Intent#FLAG_ACTIVITY_MATCH_EXTERNAL), [FLAG_ACTIVITY_NO_HISTORY](/reference/android/content/Intent#FLAG_ACTIVITY_NO_HISTORY) (/reference/android/content/Intent#FLAG_ACTIVITY_NO_HISTORY),

FLAG_ACTIVITY_SINGLE_TOP (/reference/android/content/Intent#FLAG_ACTIVITY_SINGLE_TOP),
FLAG_ACTIVITY_NEW_TASK (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK),
FLAG_ACTIVITY_MULTIPLE_TASK (/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK),
FLAG_ACTIVITY_CLEAR_TOP (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TOP),
FLAG_ACTIVITY_FORWARD_RESULT (/reference/android/content/Intent#FLAG_ACTIVITY_FORWARD_RESULT),
FLAG_ACTIVITY_PREVIOUS_IS_TOP (/reference/android/content/Intent#FLAG_ACTIVITY_PREVIOUS_IS_TOP),
FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS
(/reference/android/content/Intent#FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS),
FLAG_ACTIVITY_BROUGHT_TO_FRONT
(/reference/android/content/Intent#FLAG_ACTIVITY_BROUGHT_TO_FRONT),
FLAG_ACTIVITY_RESET_TASK_IF_NEEDED
(/reference/android/content/Intent#FLAG_ACTIVITY_RESET_TASK_IF_NEEDED),
FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY
(/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY),
FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET
(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET),
FLAG_ACTIVITY_NEW_DOCUMENT (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT),
FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET
(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET),
FLAG_ACTIVITY_NO_USER_ACTION (/reference/android/content/Intent#FLAG_ACTIVITY_NO_USER_ACTION),
FLAG_ACTIVITY_REORDER_TO_FRONT (/reference/android/content/Intent#FLAG_ACTIVITY_REORDER_TO_FRONT),
FLAG_ACTIVITY_NO_ANIMATION (/reference/android/content/Intent#FLAG_ACTIVITY_NO_ANIMATION),
FLAG_ACTIVITY_CLEAR_TASK (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TASK),
FLAG_ACTIVITY_TASK_ON_HOME (/reference/android/content/Intent#FLAG_ACTIVITY_TASK_ON_HOME),
FLAG_ACTIVITY_RETAIN_IN_RECENTS
(/reference/android/content/Intent#FLAG_ACTIVITY_RETAIN_IN_RECENTS), FLAG_ACTIVITY_LAUNCH_ADJACENT
(/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCH_ADJACENT), FLAG_RECEIVER_REGISTERED_ONLY
(/reference/android/content/Intent#FLAG_RECEIVER_REGISTERED_ONLY), FLAG_RECEIVER_REPLACE_PENDING
(/reference/android/content/Intent#FLAG_RECEIVER_REPLACE_PENDING), FLAG_RECEIVER_FOREGROUND
(/reference/android/content/Intent#FLAG_RECEIVER_FOREGROUND), FLAG_RECEIVER_NO_ABORT
(/reference/android/content/Intent#FLAG_RECEIVER_NO_ABORT),
android.content.Intent.FLAG_RECEIVER_REGISTERED_ONLY_BEFORE_BOOT,
android.content.Intent.FLAG_RECEIVER_BOOT_UPGRADE,
android.content.Intent.FLAG_RECEIVER_INCLUDE_BACKGROUND,
android.content.Intent.FLAG_RECEIVER_EXCLUDE_BACKGROUND,

android.content.Intent.FLAG_RECEIVER_FROM_SHELL, FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS (/reference/android/content/Intent#FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS), and android.content.Intent.FLAG_RECEIVER_OFFLOAD

See also:

setFlags(int) (/reference/android/content/Intent#setFlags(int))

addFlags(int) (/reference/android/content/Intent#addFlags(int))

removeFlags(int) (/reference/android/content/Intent#removeFlags(int))

getFloatArrayExtra

Added in API level 1 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public float[] getFloatArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name	String: The name of the desired item.
------	--

Returns

float[]	the value of an item previously added with putExtra(), or null if no float array value was found.
---------	---

See also:

[putExtra\(String, float\[\]\)](/reference/android/content/Intent#putExtra(java.lang.String,%20float[])) (/reference/android/content/Intent#putExtra(java.lang.String,%20float[]))

getFloatExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public float getFloatExtra (String (/reference/java/lang/String) name,  
                           float defaultValue)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

defaultValue **float:** the value to be returned if no value of the desired type is stored with the given name.

Returns

float the value of an item previously added with `putExtra()`, or the default value if no such item is present

See also:

[putExtra\(String, float\)](/reference/android/content/Intent#putExtra(java.lang.String,%20float)) (/reference/android/content/Intent#putExtra(java.lang.String,%20float))

getIdentifier

Added in [API level 29](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)


```
public String (/reference/java/lang/String) getIdentifier ()
```

Retrieve the identifier for this Intent. If non-null, this is an arbitrary identity of the Intent to distinguish it from other Intents.

Returns

String (/reference/java/lang/String) The identifier of this intent or null if none is specified.

See also:

setIdentifier(String) (/reference/android/content/Intent#setIdentifier(java.lang.String))

getIntArrayExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public int[] getIntArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

int[] the value of an item previously added with putExtra(), or null if no int array value was found.

See also:

[putExtra\(String, int\[\]\)](/reference/android/content/Intent#putExtra(java.lang.String,%20int[])) (/reference/android/content/Intent#putExtra(java.lang.String,%20int[]))

getIntExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public int getIntExtra (String (/reference/java/lang/String) name,  
                        int defaultValue)
```

Retrieve extended data from the intent.

Parameters

name	String: The name of the desired item.
defaultValue	int: the value to be returned if no value of the desired type is stored with the given name.

Returns

int	the value of an item previously added with <code>putExtra()</code> , or the default value if none was found.
------------	--

See also:

[putExtra\(String, int\)](/reference/android/content/Intent#putExtra(java.lang.String,%20int)) (/reference/android/content/Intent#putExtra(java.lang.String,%20int))

getIntegerArrayListExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public ArrayList (<Integer> getIntegerArrayListExtra (

Retrieve extended data from the intent.


```

Parameters

name	String : The name of the desired item.
------	---

Returns

ArrayList < Integer >	the value of an item previously added with <code>putIntegerArrayListExtra()</code> , or null if no <code>ArrayList</code> value was found.
--	--

See also:

[**putIntegerArrayListExtra\(String, ArrayList\)**](/reference/android/content/Intent#putIntegerArrayListExtra(java.lang.String,%20java.util.ArrayList<java.lang.Integer>)))

(/reference/android/content/Intent#putIntegerArrayListExtra(java.lang.String,%20java.util.ArrayList<java.lang.Integer>))

getIntent

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 15](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static Intent getIntent (String uri)
```

This method was deprecated in API level 15.

Use `parseUri(String, int)` ([/reference/android/content/Intent#parseUri\(java.lang.String,%20int\)](/reference/android/content/Intent#parseUri(java.lang.String,%20int))) instead.

Call `parseUri(String, int)` ([/reference/android/content/Intent#parseUri\(java.lang.String,%20int\)](/reference/android/content/Intent#parseUri(java.lang.String,%20int))) with 0 flags.

Parameters

uri **String**

Returns

Intent

(</reference/android/content/Intent>)

Throws

URISyntaxException

(</reference/java/net/URISyntaxException>)

getIntentOld

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public static Intent getIntentOld (String uri)
```

Parameters

uri **String**

Returns

Intent

(/reference/android/content/Intent)

Throws

URISyntaxException

(/reference/java/net/URISyntaxException)

getLongArrayExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public long[] getLongArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

long [] the value of an item previously added with `putExtra()`, or null if no long array value was found.

See also:

[putExtra\(String, long\[\]\)](/reference/android/content/Intent#putExtra(java.lang.String,%20long[])) (/reference/android/content/Intent#putExtra(java.lang.String,%20long[]))

getLongExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public long getLongExtra (String name,  
                        long defaultValue)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

defaultValue **long:** the value to be returned if no value of the desired type is stored with the given name.

Returns

long the value of an item previously added with `putExtra()`, or the default value if none was found.

See also:

putExtra(String, long) (/reference/android/content/Intent#putExtra(java.lang.String,%20long))

getPackage

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String (/reference/java/lang/String) getPackage ()
```

Retrieve the application package name this Intent is limited to. When resolving an Intent, if non-null this limits the resolution to only components in the given application package.

Returns

String The name of the application package for the Intent.
(/reference/java/lang/String)

See also:

resolveActivity(PackageManager) (/reference/android/content/Intent#resolveActivity(android.content.pm.PackageManager))

setPackage(String) (/reference/android/content/Intent#setPackage(java.lang.String))

getParcelableArrayExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Parcelable[(Parcelable)] (/reference/android/os/Parcelable) getParcelableArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

Parcelable[] the value of an item previously added with `putExtra()`, or null if no `Parcelable[]` value was found.
(/reference/android/os/Parcelable)

See also:

`putExtra(String, Parcelable[])` (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Parcelable[]))

`getParcelableArrayListExtra`

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public ArrayList (/reference/java/util/ArrayList)<T> getParcelableArrayListExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

ArrayList the value of an item previously added with `putParcelableArrayListExtra()`, or null if no `ArrayList` value was found.
(/reference/java/util/ArrayList)
<T>

See also:

putParcelableArrayListExtra(String, ArrayList)

(/reference/android/content/Intent#putParcelableArrayListExtra(java.lang.String,%20java.util.ArrayList<?%20extends%20android.os.Parcelable>))

getParcelableExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public T getParcelableExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

T the value of an item previously added with `putExtra()`, or null if no `Parcelable` value was found.

See also:

putExtra(String, Parcelable) (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Parcelable))

getScheme

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String (/reference/java/lang/String) getScheme ()
```

Return the scheme portion of the intent's data. If the data is null or does not include a scheme, null is returned. Otherwise, the scheme prefix without the final ':' is returned, i.e. "http".

This is the same as calling `getData().getScheme()` (and checking for null data).

Returns

[String](#) The scheme of this intent.
(/reference/java/lang/String)

See also:

[getData\(\)](#) (/reference/android/content/Intent#getData())

getSelector

Added in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) getSelector ()
```

Return the specific selector associated with this Intent. If there is none, returns null. See [setSelector\(Intent\)](#) (/reference/android/content/Intent#setSelector(android.content.Intent)) for more information.

Returns

Intent

(/reference/android/content/Intent)

See also:

setSelector(Intent) (/reference/android/content/Intent#setSelector(android.content.Intent))

getSerializableExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Serializable (/reference/java/io/Serializable) getSerializableExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

Serializable (/reference/java/io/Serializable) the value of an item previously added with `putExtra()`, or null if no Serializable value was found.

See also:

putExtra(String, Serializable) (/reference/android/content/Intent#putExtra(java.lang.String,%20java.io.Serializable))

getShortArrayExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public short[] getShortArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

short[] the value of an item previously added with `putExtra()`, or null if no short array value was found.

See also:

[putExtra\(\[String\]\(#\), \[short\\[\\]\]\(#\)\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20short[]))

getShortExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public short getShortExtra (String (/reference/java/lang/String) name,  
                           short defaultValue)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

defaultValue **short:** the value to be returned if no value of the desired type is stored with the given name.

Returns

short the value of an item previously added with `putExtra()`, or the default value if none was found.

See also:

[`putExtra\(String, short\)`](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20short))

getSourceBounds

Added in [API level 7](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

public [Rect](#) (/reference/android/graphics/Rect) getSourceBounds ()

Get the bounds of the sender of this intent, in screen coordinates. This can be used as a hint to the receiver for animations and the like. Null means that there is no source bounds.

Returns

[Rect](#) This value may be **null**.

(/reference/android/graphics/Rec

t)

getStringArrayExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String[] (/reference/java/lang/String) getStringArrayExtra (String (/reference/java/lang/String) name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

[String](#)[] (/reference/java/lang/String) the value of an item previously added with `putExtra()`, or null if no String array value was found.

See also:

[putExtra\(\[String\]\(#\), \[String\]\(#\)\[\]\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20java.lang.String[]))

getStringArrayListExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public ArrayList (/reference/java/util/ArrayList)<String (/reference/java/lang/String)> getStringArrayListExtra (String (/reference/jav
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

ArrayList the value of an item previously added with `putStringArrayListExtra()`, or null if no `ArrayList` value was found.

(/reference/java/util/ArrayList)

<String

(/reference/java/lang/String)>

See also:

`putStringArrayListExtra(String, ArrayList)`

(/reference/android/content/Intent#putStringArrayListExtra(java.lang.String,%20java.util.ArrayList<java.lang.String>))

getStringExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String getStringExtra (String name)
```

Retrieve extended data from the intent.

Parameters

name **String:** The name of the desired item.

Returns

String the value of an item previously added with `putExtra()`, or null if no String value was found.
(/reference/java/lang/String)

See also:

[putExtra\(String, String\)](/reference/android/content/Intent#putExtra(java.lang.String,%20java.lang.String)) (/reference/android/content/Intent#putExtra(java.lang.String,%20java.lang.String))

getType

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String (/reference/java/lang/String) getType ()
```

Retrieve any explicit MIME type included in the intent. This is usually null, as the type is determined by the intent data.

Returns

String If a type was manually set, it is returned; else null is returned.
(/reference/java/lang/String)

See also:

[resolveType\(ContentResolver\)](/reference/android/content/Intent#resolveType(android.content.ContentResolver)) (/reference/android/content/Intent#resolveType(android.content.ContentResolver))

[setType\(String\)](/reference/android/content/Intent#setType(java.lang.String)) (/reference/android/content/Intent#setType(java.lang.String))

hasCategory

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)


```
public boolean hasCategory (String (/reference/java/lang/String) category)
```

Check if a category exists in the intent.

Parameters

category **String:** The category to check.

Returns

boolean boolean True if the intent contains the category, else false.

See also:

[getCategories\(\)](#) (/reference/android/content/Intent#getCategories())

[addCategory\(String\)](#) (/reference/android/content/Intent#addCategory(java.lang.String))

hasExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean hasExtra (String (/reference/java/lang/String) name)
```

Returns true if an extra value is associated with the given name.

Parameters

name **String:** the extra's name

Returns

boolean true if the given extra is present.

hasFileDescriptors

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public boolean hasFileDescriptors ()
```

Returns true if the Intent's extras contain a parcelled file descriptor.

Returns

boolean true if the Intent contains a parcelled file descriptor.

makeMainActivity

Added in [API level 11](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static Intent (/reference/android/content/Intent) makeMainActivity (ComponentName (/reference/android/content/ComponentName))
```

Create an intent to launch the main (root) activity of a task. This is the Intent that is started when the application's is launched from Home. For anything else that wants to launch an application in the same way, it is important that they use an Intent structured the same way, and can use this function to ensure this is the case.

The returned Intent has the given Activity component as its explicit component, [ACTION_MAIN](#) (/reference/android/content/Intent#ACTION_MAIN) as its action, and includes the category [CATEGORY_LAUNCHER](#) (/reference/android/content/Intent#CATEGORY_LAUNCHER). This does *not* have [FLAG_ACTIVITY_NEW_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) set, though typically you will want to do that through [addFlags\(int\)](#) (/reference/android/content/Intent#addFlags(int)) on the returned Intent.

Parameters

mainActivity **ComponentName:** The main activity component that this Intent will launch.

Returns

Intent Returns a newly created Intent that can be used to launch the activity as a main application entry.
(/reference/android/content/Intent)

See also:

[setClass\(Context, Class\)](#) (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>))

[setComponent\(ComponentName\)](#) (/reference/android/content/Intent#setComponent(android.content.ComponentName))

makeMainSelectorActivity

Added in [API level 15](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static Intent (/reference/android/content/Intent) makeMainSelectorActivity (String (/reference/java/lang/String) selectorAc  
String (/reference/java/lang/String) selectorCategory)
```

Make an Intent for the main activity of an application, without specifying a specific activity to run but giving a selector to find the activity. This results in a final Intent that is structured the same as when the application is launched from Home. For anything else that wants to launch an application in the same way, it is important that they use an Intent structured the same way, and can use this function to ensure this is the case.

The returned Intent has **ACTION_MAIN** (/reference/android/content/Intent#ACTION_MAIN) as its action, and includes the category **CATEGORY_LAUNCHER** (/reference/android/content/Intent#CATEGORY_LAUNCHER). This does *not* have **FLAG_ACTIVITY_NEW_TASK** (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) set, though typically you will want to do that through **addFlags(int)** (/reference/android/content/Intent#addFlags(int)) on the returned Intent.

Parameters

selectorAction **String:** The action name of the Intent's selector.

selectorCategory **String:** The name of a category to add to the Intent's selector.

Returns

Intent Returns a newly created Intent that can be used to launch the activity as a main application entry.
(/reference/android/content/Intent)

See also:

setSelector(Intent) (/reference/android/content/Intent#setSelector(android.content.Intent))

makeRestartActivityTask

Added in **API level 11** (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static Intent (/reference/android/content/Intent) makeRestartActivityTask (ComponentName (/reference/android/content/Comp
```

Make an Intent that can be used to re-launch an application's task in its base state. This is like

[makeMainActivity\(android.content.ComponentName\)](#).

(/reference/android/content/Intent#makeMainActivity(android.content.ComponentName)), but also sets the flags [FLAG_ACTIVITY_NEW_TASK](#)

(/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK) and [FLAG_ACTIVITY_CLEAR_TASK](#)

(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TASK).

Parameters

mainActivity

ComponentName: The activity component that is the root of the task; this is the activity that has been published in the application's manifest as the main launcher icon.

Returns

[Intent](#)

Returns a newly created Intent that can be used to relaunch the activity's task in its root state.

(/reference/android/content/Intent)

normalizeMimeType

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static String (/reference/java/lang/String) normalizeMimeType (String (/reference/java/lang/String) type)
```

Normalize a MIME data type.

A normalized MIME type has white-space trimmed, content-type parameters removed, and is lower-case. This aligns the type with Android best practices for intent filtering.

For example, "text/plain; charset=utf-8" becomes "text/plain". "text/x-vCard" becomes "text/x-vcard".

All MIME types received from outside Android (such as user input, or external sources like Bluetooth, NFC, or the Internet) should be normalized before they are used to create an Intent.

Parameters

type **String:** MIME data type to normalize This value may be `null`.

Returns

String normalized MIME data type, or null if the input was null
(/reference/java/lang/String)

See also:

[setType\(String\)](/reference/android/content/Intent#setType(java.lang.String)) (/reference/android/content/Intent#setType(java.lang.String))

[setTypeAndNormalize\(String\)](/reference/android/content/Intent#setTypeAndNormalize(java.lang.String)) (/reference/android/content/Intent#setTypeAndNormalize(java.lang.String))

parseIntent

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static Intent parseIntent (Resources resource,
XmlPullParser parser,
AttributeSet attrs)
```

Parses the "intent" element (and its children) from XML and instantiates an Intent object. The given XML parser should be located at the tag where parsing should start (often named "intent"), from which the basic action, data, type, and package and class name will be retrieved. The function will then parse in to any child elements, looking for tags to add categories and to attach extra data to the intent.

Parameters

resources	Resources: The Resources to use when inflating resources. This value must never be null .
parser	XmlPullParser: The XML parser pointing at an "intent" tag. This value must never be null .
attrs	AttributeSet: The AttributeSet interface for retrieving extended attribute data at the current parser location.

Returns

Intent An Intent object matching the XML data. This value will never be **null**.
(/reference/android/content/Intent)

Throws

XmlPullParserException If there was an XML parsing error.
(/reference/org/xmlpull/v1/XmlPullParserException)

IOException If there was an I/O error.
(/reference/java/io/IOException)

parseUri

Added in [API level 4](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public static Intent (/reference/android/content/Intent) parseUri (String (/reference/java/lang/String) uri,  
    int flags)
```

Create an intent from a URI. This URI may encode the action, category, and other intent fields, if it was returned by [toUri\(int\)](#). (/reference/android/content/Intent#toUri(int)). If the Intent was not generate by toUri(), its data will be the entire URI and its action will be ACTION_VIEW.

The URI given here must not be relative -- that is, it must include the scheme and full path.

Parameters

uri	String: The URI to turn into an Intent.
flags	int: Additional processing flags. Value is either 0 or a combination of URI_ALLOW_UNSAFE (/reference/android/content/Intent#URI_ALLOW_UNSAFE), URI_ANDROID_APP_SCHEME (/reference/android/content/Intent#URI_ANDROID_APP_SCHEME), and URI_INTENT_SCHEME (/reference/android/content/Intent#URI_INTENT_SCHEME)

Returns

[Intent](#) (/reference/android/content/Intent)
Intent The newly created Intent object.

Throws

URISyntaxException Throws `URISyntaxError` if the basic URI syntax is bad (as parsed by the `Uri` class) or the Intent data within the URI is (/reference/java/net/URISyntaxException)

See also:

toUri(int) (/reference/android/content/Intent#toUri(int))

putCharSequenceArrayListExtra

Added in [API level 8](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putCharSequenceArrayListExtra (String (/reference/java/lang/String) name,
    ArrayList (/reference/java/util/ArrayList)<CharSequence (/reference/java/lang/CharSequence)> value)
```

Add extended data to the intent. The name must include a package prefix, for example the app `com.android.contacts` would use names like `"com.android.contacts.ShowAll"`.

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	ArrayList: The ArrayList data value. This value may be <code>null</code> .
--------------	---

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be <code>null</code> .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getCharSequenceArrayListExtra\(String\)](/reference/android/content/Intent#getCharSequenceArrayListExtra(java.lang.String)) (/reference/android/content/Intent#getCharSequenceArrayListExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                Parcelable value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	Parcelable: The Parcelable data value. This value may be null .
--------------	---

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getParcelableExtra\(String\)](/reference/android/content/Intent#getParcelableExtra(java.lang.String)) (/reference/android/content/Intent#getParcelableExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                long[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **long:** The byte array data value. This value may be **null**.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getLongArrayExtra\(String\)](/reference/android/content/Intent#getLongArrayExtra(java.lang.String)) (/reference/android/content/Intent#getLongArrayExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                byte value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	byte: The byte data value.
--------------	-----------------------------------

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getBytes\(String, byte\)](/reference/android/content/Intent#getBytes(java.lang.String,%20byte)) (/reference/android/content/Intent#getBytes(java.lang.String,%20byte))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putExtra (String (/reference/java/lang/String) name,  
                double[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **double:** The double array data value. This value may be **null**.

Returns

Intent (/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getDoubleArrayExtra\(String\)](/reference/android/content/Intent#getDoubleArrayExtra(java.lang.String)) (/reference/android/content/Intent#getDoubleArrayExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                CharSequence value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **CharSequence:** The CharSequence data value. This value may be **null**.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getCharSequenceExtra\(String\)](/reference/android/content/Intent#getCharSequenceExtra(java.lang.String)) (/reference/android/content/Intent#getCharSequenceExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                boolean[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **boolean:** The boolean array data value. This value may be **null**.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](#) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](#) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getBooleanArrayExtra\(String\)](#) (/reference/android/content/Intent#getBooleanArrayExtra(java.lang.String))

putExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putExtra (String (/reference/java/lang/String) name,  
int value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	int: The integer data value.
--------------	-------------------------------------

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getIntExtra\(String, int\)](/reference/android/content/Intent#getIntExtra(java.lang.String,%20int)) (/reference/android/content/Intent#getIntExtra(java.lang.String,%20int))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                char[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	char: The char array data value. This value may be null .
--------------	---

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getCharArrayExtra\(String\)](/reference/android/content/Intent#getCharArrayExtra(java.lang.String)) (/reference/android/content/Intent#getCharArrayExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putExtra (String (/reference/java/lang/String) name,  
                byte[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **byte:** The byte array data value. This value may be **null**.

Returns

Intent (/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getByteArrayExtra\(String\)](/reference/android/content/Intent#getByteArrayExtra(java.lang.String)) (/reference/android/content/Intent#getByteArrayExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                Parcelable\[\] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **Parcelable:** The Parcelable[] data value. This value may be **null**.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](#) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](#) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getParcelableArrayExtra\(String\)](#) (/reference/android/content/Intent#getParcelableArrayExtra(java.lang.String))

putExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putExtra (String (/reference/java/lang/String) name,  
                Bundle (/reference/android/os/Bundle) value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **Bundle:** The Bundle data value. This value may be **null**.

Returns

[Intent](#) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getBundleExtra\(String\)](/reference/android/content/Intent#getBundleExtra(java.lang.String)) (/reference/android/content/Intent#getBundleExtra(java.lang.String))

putExtra

Added in [API level 8](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                CharSequence[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **CharSequence:** The CharSequence array data value. This value may be **null**.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](#) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](#) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getCharSequenceArrayExtra\(String\)](#) (/reference/android/content/Intent#getCharSequenceArrayExtra(java.lang.String))

putExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putExtra (String (/reference/java/lang/String) name,  
float[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **float:** The float array data value. This value may be **null**.

Returns

[Intent](#) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getFloatArrayExtra\(String\)](/reference/android/content/Intent#getFloatArrayExtra(java.lang.String)) (/reference/android/content/Intent#getFloatArrayExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                double value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **double:** The double data value.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getDoubleExtra\(String, double\)](/reference/android/content/Intent#getDoubleExtra(java.lang.String,%20double)) (/reference/android/content/Intent#getDoubleExtra(java.lang.String,%20double))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                int[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	int: The int array data value. This value may be null .
--------------	---

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getIntArrayExtra\(String\)](/reference/android/content/Intent#getIntArrayExtra(java.lang.String)) (/reference/android/content/Intent#getIntArrayExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                String[]) value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **String:** The String array data value. This value may be **null**.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](#) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](#) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getStringArrayExtra\(String\)](#) (/reference/android/content/Intent#getStringArrayExtra(java.lang.String))

putExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putExtra (String (/reference/java/lang/String) name,  
                short[] value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	short: The short array data value. This value may be null .
--------------	---

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getShortArrayExtra\(String\)](/reference/android/content/Intent#getShortArrayExtra(java.lang.String)) (/reference/android/content/Intent#getShortArrayExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                boolean value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **boolean:** The boolean data value.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getBooleanExtra\(String, boolean\)](/reference/android/content/Intent#getBooleanExtra(java.lang.String,%20boolean)) (/reference/android/content/Intent#getBooleanExtra(java.lang.String,%20boolean))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                    String value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **String:** The String data value. This value may be **null**.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getStringExtra\(String\)](/reference/android/content/Intent#getStringExtra(java.lang.String)) (/reference/android/content/Intent#getStringExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                    long value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **long:** The long data value.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getLongExtra\(String, long\)](/reference/android/content/Intent#getLongExtra(java.lang.String,%20long)) (/reference/android/content/Intent#getLongExtra(java.lang.String,%20long))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putExtra (String (/reference/java/lang/String) name,  
char value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	char: The char data value.
--------------	-----------------------------------

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getCharExtra\(String, char\)](/reference/android/content/Intent#getCharExtra(java.lang.String,%20char)) (/reference/android/content/Intent#getCharExtra(java.lang.String,%20char))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                Serializable value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name **String:** The name of the extra data, with package prefix.

value **Serializable:** The Serializable data value. This value may be **null**.

Returns

[Intent](/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getSerializableExtra\(String\)](/reference/android/content/Intent#getSerializableExtra(java.lang.String)) (/reference/android/content/Intent#getSerializableExtra(java.lang.String))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                float value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	float: The float data value.
--------------	-------------------------------------

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getFloatExtra\(String, float\)](/reference/android/content/Intent#getFloatExtra(java.lang.String,%20float)) (/reference/android/content/Intent#getFloatExtra(java.lang.String,%20float))

putExtra

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtra (String name,  
                short value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
-------------	---

value	short: The short data value.
--------------	-------------------------------------

Returns

<u>Intent</u> (/reference/android/content/Intent)	Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be null .
---	---

See also:

[putExtras\(Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)) (/reference/android/content/Intent#putExtras(android.content.Intent))

[removeExtra\(String\)](/reference/android/content/Intent#removeExtra(java.lang.String)) (/reference/android/content/Intent#removeExtra(java.lang.String))

[getShortExtra\(String, short\)](/reference/android/content/Intent#getShortExtra(java.lang.String,%20short)) (/reference/android/content/Intent#getShortExtra(java.lang.String,%20short))

putExtras

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent putExtras (Intent src)
```

Copy all extras in 'src' in to this intent.

Parameters

src **Intent:** Contains the extras to copy. This value must never be **null**.

Returns

[Intent](/reference/android/content/Intent) This value will never be **null**.
(/reference/android/content/Intent)

See also:

[putExtra\(String, Bundle\)](/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Bundle)) (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Bundle))

putExtras

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putExtras (Bundle (/reference/android/os/Bundle) extras)
```

Add a set of extended data to the intent. The keys must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

extras **Bundle:** The Bundle of extras to add to this intent. This value must never be `null`.

Returns

[Intent](#) This value will never be `null`.
(/reference/android/content/Intent)

See also:

[putExtra\(String, Bundle\)](#) (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Bundle))

[removeExtra\(String\)](#) (/reference/android/content/Intent#removeExtra(java.lang.String))

putIntegerArrayListExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putIntegerArrayListExtra (String (/reference/java/lang/String) name,  
    ArrayList (/reference/java/util/ArrayList)<Integer (/reference/java/lang/Integer)> value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
value	ArrayList: The ArrayList data value. This value may be null .

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

putExtras(Intent) (/reference/android/content/Intent#putExtras(android.content.Intent))

removeExtra(String) (/reference/android/content/Intent#removeExtra(java.lang.String))

getIntegerArrayListExtra(String) (/reference/android/content/Intent#getIntegerArrayListExtra(java.lang.String))

putParcelableArrayListExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putParcelableArrayListExtra (String (/reference/java/lang/String) name,  
    ArrayList (/reference/java/util/ArrayList)<? extends Parcelable (/reference/android/os/Parcelable)> value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
value	ArrayList: The ArrayList data value. This value may be null .

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

putExtras(Intent) (/reference/android/content/Intent#putExtras(android.content.Intent))

removeExtra(String) (/reference/android/content/Intent#removeExtra(java.lang.String))

getParcelableArrayListExtra(String) (/reference/android/content/Intent#getParcelableArrayListExtra(java.lang.String))

putStringArrayListExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) putStringArrayListExtra (String (/reference/java/lang/String) name,  
    ArrayList (/reference/java/util/ArrayList)<String (/reference/java/lang/String)> value)
```

Add extended data to the intent. The name must include a package prefix, for example the app com.android.contacts would use names like "com.android.contacts.ShowAll".

Parameters

name	String: The name of the extra data, with package prefix.
value	ArrayList: The ArrayList data value. This value may be null .

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(</reference/android/content/Intent>)

See also:

putExtras(Intent) ([/reference/android/content/Intent#putExtras\(android.content.Intent\)](/reference/android/content/Intent#putExtras(android.content.Intent)))

removeExtra(String) ([/reference/android/content/Intent#removeExtra\(java.lang.String\)](/reference/android/content/Intent#removeExtra(java.lang.String)))

getStringArrayListExtra(String) ([/reference/android/content/Intent#getStringArrayListExtra\(java.lang.String\)](/reference/android/content/Intent#getStringArrayListExtra(java.lang.String)))

readFromParcel

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public void readFromParcel (Parcel in)
```

Parameters

in **Parcel**

removeCategory

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public void removeCategory (String (/reference/java/lang/String) category)
```

Remove a category from an intent.

Parameters

category **String:** The category to remove.

See also:

[addCategory\(\[String\]\(#\)\)](#) (/reference/android/content/Intent#addCategory(java.lang.String))

removeExtra

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public void removeExtra (String (/reference/java/lang/String) name)
```

Remove extended data from the intent.

Parameters

name **String**

See also:

[putExtra\(String, Bundle\)](/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Bundle)) (/reference/android/content/Intent#putExtra(java.lang.String,%20android.os.Bundle))

removeFlags

Added in [API level 26](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public void removeFlags (int flags)
```

Remove these flags from the intent.

Parameters

flags **int**: The flags to remove. Value is either **0** or a combination of [FLAG_GRANT_READ_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION), [FLAG_GRANT_WRITE_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), [FLAG_FROM_BACKGROUND](/reference/android/content/Intent#FLAG_FROM_BACKGROUND) (/reference/android/content/Intent#FLAG_FROM_BACKGROUND), [FLAG_DEBUG_LOG_RESOLUTION](/reference/android/content/Intent#FLAG_DEBUG_LOG_RESOLUTION) (/reference/android/content/Intent#FLAG_DEBUG_LOG_RESOLUTION), [FLAG_EXCLUDE_STOPPED_PACKAGES](/reference/android/content/Intent#FLAG_EXCLUDE_STOPPED_PACKAGES) (/reference/android/content/Intent#FLAG_EXCLUDE_STOPPED_PACKAGES), [FLAG_INCLUDE_STOPPED_PACKAGES](/reference/android/content/Intent#FLAG_INCLUDE_STOPPED_PACKAGES) (/reference/android/content/Intent#FLAG_INCLUDE_STOPPED_PACKAGES), [FLAG_GRANT_PERSISTABLE_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION), [FLAG_GRANT_PREFIX_URI_PERMISSION](/reference/android/content/Intent#FLAG_GRANT_PREFIX_URI_PERMISSION) (/reference/android/content/Intent#FLAG_GRANT_PREFIX_URI_PERMISSION),

android.content.Intent.FLAG_DEBUG_TRIAGED_MISSING, android.content.Intent.FLAG_IGNORE_EPHEMERAL,
FLAG_ACTIVITY_MATCH_EXTERNAL (/reference/android/content/Intent#FLAG_ACTIVITY_MATCH_EXTERNAL),
FLAG_ACTIVITY_NO_HISTORY (/reference/android/content/Intent#FLAG_ACTIVITY_NO_HISTORY),
FLAG_ACTIVITY_SINGLE_TOP (/reference/android/content/Intent#FLAG_ACTIVITY_SINGLE_TOP),
FLAG_ACTIVITY_NEW_TASK (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK),
FLAG_ACTIVITY_MULTIPLE_TASK (/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK),
FLAG_ACTIVITY_CLEAR_TOP (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TOP),
FLAG_ACTIVITY_FORWARD_RESULT (/reference/android/content/Intent#FLAG_ACTIVITY_FORWARD_RESULT),
FLAG_ACTIVITY_PREVIOUS_IS_TOP (/reference/android/content/Intent#FLAG_ACTIVITY_PREVIOUS_IS_TOP),
FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS
(/reference/android/content/Intent#FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS),
FLAG_ACTIVITY_BROUGHT_TO_FRONT
(/reference/android/content/Intent#FLAG_ACTIVITY_BROUGHT_TO_FRONT),
FLAG_ACTIVITY_RESET_TASK_IF_NEEDED
(/reference/android/content/Intent#FLAG_ACTIVITY_RESET_TASK_IF_NEEDED),
FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY
(/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY),
FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET
(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET),
FLAG_ACTIVITY_NEW_DOCUMENT (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT),
FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET
(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET),
FLAG_ACTIVITY_NO_USER_ACTION (/reference/android/content/Intent#FLAG_ACTIVITY_NO_USER_ACTION),
FLAG_ACTIVITY_REORDER_TO_FRONT (/reference/android/content/Intent#FLAG_ACTIVITY_REORDER_TO_FRONT)
, FLAG_ACTIVITY_NO_ANIMATION (/reference/android/content/Intent#FLAG_ACTIVITY_NO_ANIMATION),
FLAG_ACTIVITY_CLEAR_TASK (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TASK),
FLAG_ACTIVITY_TASK_ON_HOME (/reference/android/content/Intent#FLAG_ACTIVITY_TASK_ON_HOME),
FLAG_ACTIVITY_RETAIN_IN_RECENTS
(/reference/android/content/Intent#FLAG_ACTIVITY_RETAIN_IN_RECENTS), FLAG_ACTIVITY_LAUNCH_ADJACENT
(/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCH_ADJACENT), FLAG_RECEIVER_REGISTERED_ONLY
(/reference/android/content/Intent#FLAG_RECEIVER_REGISTERED_ONLY), FLAG_RECEIVER_REPLACE_PENDING
(/reference/android/content/Intent#FLAG_RECEIVER_REPLACE_PENDING), FLAG_RECEIVER_FOREGROUND
(/reference/android/content/Intent#FLAG_RECEIVER_FOREGROUND), FLAG_RECEIVER_NO_ABORT
(/reference/android/content/Intent#FLAG_RECEIVER_NO_ABORT),
android.content.Intent.FLAG_RECEIVER_REGISTERED_ONLY_BEFORE_BOOT,

android.content.Intent.FLAG_RECEIVER_BOOT_UPGRADE,
android.content.Intent.FLAG_RECEIVER_INCLUDE_BACKGROUND,
android.content.Intent.FLAG_RECEIVER_EXCLUDE_BACKGROUND,
android.content.Intent.FLAG_RECEIVER_FROM_SHELL, FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS
(/reference/android/content/Intent#FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS), and
android.content.Intent.FLAG_RECEIVER_OFFLOAD

See also:

setFlags(int) (/reference/android/content/Intent#setFlags(int))

getFlags() (/reference/android/content/Intent#getFlags())

addFlags(int) (/reference/android/content/Intent#addFlags(int))

replaceExtras

Added in API level 3 (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) replaceExtras (Intent (/reference/android/content/Intent) src)
```

Completely replace the extras in the Intent with the extras in the given Intent.

Parameters

src **Intent:** The exact extras contained in this Intent are copied into the target intent, replacing any that were previously there. This value must never be **null**.

Returns

IntentThis value will never be `null`.

(/reference/android/content/Intent)

replaceExtrasAdded in [API level 3](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) replaceExtras (Bundle (/reference/android/os/Bundle) extras)
```

Completely replace the extras in the Intent with the given Bundle of extras.

Parameters

extras**Bundle:** The new set of extras in the Intent, or null to erase all extras. This value may be `null`.**Returns****Intent**

(/reference/android/content/Intent)

resolveActivityAdded in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public ComponentName (/reference/android/content/ComponentName) resolveActivity (PackageManager (/reference/android/content/pm,
```

Return the Activity component that should be used to handle this intent. The appropriate component is determined based on the information in the intent, evaluated as follows:

If **`getComponent()`** ([/reference/android/content/Intent#getComponent\(\)](#)) returns an explicit class, that is returned without any further consideration.

The activity must handle the **`Intent#CATEGORY_DEFAULT`** ([/reference/android/content/Intent#CATEGORY_DEFAULT](#)) Intent category to be considered.

If **`getAction()`** ([/reference/android/content/Intent#getAction\(\)](#)) is non-NULL, the activity must handle this action.

If **`resolveType(ContentResolver)`** ([/reference/android/content/Intent#resolveType\(android.content.ContentResolver\)](#)) returns non-NULL, the activity must handle this type.

If **`addCategory(String)`** ([/reference/android/content/Intent#addCategory\(java.lang.String\)](#)) has added any categories, the activity must handle ALL of the categories specified.

If **`getPackage()`** ([/reference/android/content/Intent#getPackage\(\)](#)) is non-NULL, only activity components in that application package will be considered.

If there are no activities that satisfy all of these conditions, a null string is returned.

If multiple activities are found to satisfy the intent, the one with the highest priority will be used. If there are multiple activities with the same priority, the system will either pick the best activity based on user preference, or resolve to a system class that will allow the user to pick an activity and forward from there.

This method is implemented simply by calling **`PackageManager#resolveActivity`** ([/reference/android/content/pm/PackageManager#resolveActivity\(android.content.Intent,%20int\)](#)) with the "defaultOnly" parameter true.

This API is called for you as part of starting an activity from an intent. You do not normally need to call it yourself.

Parameters

pm **PackageManager**: The package manager with which to resolve the Intent. This value must never be **null**.

Returns

ComponentName Name of the component implementing an activity that can display the intent.
(/reference/android/content/ComponentName)

See also:

setComponent(ComponentName) (/reference/android/content/Intent#setComponent(android.content.ComponentName))

getComponent() (/reference/android/content/Intent#getComponent())

resolveActivityInfo(PackageManager, int)

(/reference/android/content/Intent#resolveActivityInfo(android.content.pm.PackageManager,%20int))

resolveActivityInfo

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public ActivityInfo (/reference/android/content/pm/ActivityInfo) resolveActivityInfo (PackageManager (/reference/android/content/pm/PackageManager), int flags)
```

Resolve the Intent into an [ActivityInfo](/reference/android/content/pm/ActivityInfo) (/reference/android/content/pm/ActivityInfo) describing the activity that should execute the intent. Resolution follows the same rules as described for [resolveActivity\(PackageManager\)](/reference/android/content/Intent#resolveActivity(android.content.pm.PackageManager)) (/reference/android/content/Intent#resolveActivity(android.content.pm.PackageManager)), but you get back the completely information about the resolved activity instead of just its class name.

Parameters

pm	PackageManager : The package manager with which to resolve the Intent. This value must never be null .
flags	<p>int: Addition information to retrieve as per <u>PackageManager#getActivityInfo(ComponentName, int)</u> (/reference/android/content/pm/PackageManager#getActivityInfo(android.content.ComponentName,%20int)). Value is either 0 or a combination of <u>PackageManager.GET_META_DATA</u> (/reference/android/content/pm/PackageManager#GET_META_DATA), <u>PackageManager.GET_SHARED_LIBRARY_FILES</u> (/reference/android/content/pm/PackageManager#GET_SHARED_LIBRARY_FILES), <u>PackageManager.MATCH_ALL</u> (/reference/android/content/pm/PackageManager#MATCH_ALL), <u>android.content.pm.PackageManager.MATCH_DEBUG_TRIAGED_MISSING</u>, <u>PackageManager.MATCH_DEFAULT_ONLY</u> (/reference/android/content/pm/PackageManager#MATCH_DEFAULT_ONLY), <u>PackageManager.MATCH_DISABLED_COMPONENTS</u> (/reference/android/content/pm/PackageManager#MATCH_DISABLED_COMPONENTS), <u>PackageManager.MATCH_DISABLED_UNTIL_USED_COMPONENTS</u> (/reference/android/content/pm/PackageManager#MATCH_DISABLED_UNTIL_USED_COMPONENTS), <u>PackageManager.MATCH_DIRECT_BOOT_AUTO</u> (/reference/android/content/pm/PackageManager#MATCH_DIRECT_BOOT_AUTO), <u>PackageManager.MATCH_DIRECT_BOOT_AWARE</u> (/reference/android/content/pm/PackageManager#MATCH_DIRECT_BOOT_AWARE), <u>PackageManager.MATCH_DIRECT_BOOT_UNAWARE</u> (/reference/android/content/pm/PackageManager#MATCH_DIRECT_BOOT_UNAWARE), <u>PackageManager.MATCH_SYSTEM_ONLY</u> (/reference/android/content/pm/PackageManager#MATCH_SYSTEM_ONLY), <u>PackageManager.MATCH_UNINSTALLED_PACKAGES</u> (/reference/android/content/pm/PackageManager#MATCH_UNINSTALLED_PACKAGES), <u>android.content.pm.PackageManager.MATCH_INSTANT</u>, <u>android.content.pm.PackageManager.MATCH_STATIC_SHARED_LIBRARIES</u>, <u>PackageManager.GET_DISABLED_COMPONENTS</u> (/reference/android/content/pm/PackageManager#GET_DISABLED_COMPONENTS), <u>PackageManager.GET_DISABLED_UNTIL_USED_COMPONENTS</u> (/reference/android/content/pm/PackageManager#GET_DISABLED_UNTIL_USED_COMPONENTS), and <u>PackageManager.GET_UNINSTALLED_PACKAGES</u> (/reference/android/content/pm/PackageManager#GET_UNINSTALLED_PACKAGES)</p>

Returns

ActivityInfo [PackageManager.ActivityInfo](#)

([/reference/android/content/pm/](#)

[ActivityInfo](#))

See also:

resolveActivity(PackageManager) ([/reference/android/content/Intent#resolveActivity\(android.content.pm.PackageManager\)](#))

resolveType

Added in [API level 1](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public String (/reference/java/lang/String) resolveType (Context (/reference/android/content/Context) context)
```

Return the MIME data type of this intent. If the type field is explicitly set, that is simply returned. Otherwise, if the data is set, the type of that data is returned. If neither fields are set, a null is returned.

Parameters

context **Context:** This value must never be null.

Returns

String The MIME type of this intent.

([/reference/java/lang/String](#))

See also:

[getType\(\)](#) (/reference/android/content/Intent#getType())

[resolveType\(ContentResolver\)](#) (/reference/android/content/Intent#resolveType(android.content.ContentResolver))

resolveType

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String (/reference/java/lang/String) resolveType (ContentResolver (/reference/android/content/ContentResolver) resolver)
```

Return the MIME data type of this intent. If the type field is explicitly set, that is simply returned. Otherwise, if the data is set, the type of that data is returned. If neither fields are set, a null is returned.

Parameters

resolver	ContentResolver : A ContentResolver that can be used to determine the MIME type of the intent's data. This value must never be null .
-----------------	---

Returns

String (/reference/java/lang/String)	The MIME type of this intent.
--	-------------------------------

See also:

[getType\(\)](#) (/reference/android/content/Intent#getType())

[resolveType\(Context\)](#) (/reference/android/content/Intent#resolveType(android.content.Context))

resolveTypeIfNeeded

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String (/reference/java/lang/String) resolveTypeIfNeeded (ContentResolver (/reference/android/content/ContentResolver) reso]
```

Return the MIME data type of this intent, only if it will be needed for intent resolution. This is not generally useful for application code; it is used by the frameworks for communicating with back-end system services.

Parameters

resolver **ContentResolver:** A ContentResolver that can be used to determine the MIME type of the intent's data. This value must never be `null`.

Returns

String The MIME type of this intent, or null if it is unknown or not needed.
(/reference/java/lang/String)

setAction

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setAction (String (/reference/java/lang/String) action)
```

Set the general action to be performed.

Parameters

action **String:** An action name, such as ACTION_VIEW. Application-specific actions should be prefixed with the vendor's package name. This value may be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

[getAction\(\)](#) (/reference/android/content/Intent#getAction())

setClass

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setClass (Context (/reference/android/content/Context) packageContext,  
                Class (/reference/java/lang/Class)<?> cls)
```

Convenience for calling [setComponent\(android.content.ComponentName\)](#).

(/reference/android/content/Intent#setComponent(android.content.ComponentName)) with the name returned by a [Class](#) (/reference/java/lang/Class) object.

Parameters

packageContext **Context:** A Context of the application package implementing this class. This value must never be **null**.

cls **Class:** The class name to set, equivalent to `setClassName(context, cls.getName())`. This value must never

be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

setComponent(ComponentName) (/reference/android/content/Intent#setComponent(android.content.ComponentName))

setClassName

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setClassName (String (/reference/java/lang/String) packageName,  
String (/reference/java/lang/String) className)
```

Convenience for calling **setComponent(ComponentName)**

(/reference/android/content/Intent#setComponent(android.content.ComponentName)) with an explicit application package name and class name.

Parameters

packageName **String:** The name of the package implementing the desired component. This value must never be **null**.

className **String:** The name of a class inside of the application package that will be used as the component for this Intent. This value must never be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

setComponent(ComponentName) (/reference/android/content/Intent#setComponent(android.content.ComponentName))

setClass(Context, Class) (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>))

setClassName

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setClassName (Context (/reference/android/content/Context) packageContext,  
String (/reference/java/lang/String) className)
```

Convenience for calling **setComponent(ComponentName)**.

(/reference/android/content/Intent#setComponent(android.content.ComponentName)) with an explicit class name.

Parameters

packageContext **Context:** A Context of the application package implementing this class. This value must never be **null**.

className **String:** The name of a class inside of the application package that will be used as the component for this Intent. This value must never be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be `null`.
(/reference/android/content/Intent)

See also:

setComponent(ComponentName) (/reference/android/content/Intent#setComponent(android.content.ComponentName))

setClass(Context, Class) (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>))

setClipData

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public void setClipData (ClipData (/reference/android/content/ClipData) clip)
```

Set a [ClipData](#) (/reference/android/content/ClipData) associated with this Intent. This replaces any previously set ClipData.

The ClipData in an intent is not used for Intent matching or other such operations. Semantically it is like extras, used to transmit additional data with the Intent. The main feature of using this over the extras for data is that [FLAG_GRANT_READ_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION) and [FLAG_GRANT_WRITE_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION) will operate on any URI items included in the clip data. This is useful, in particular, if you want to transmit an Intent containing multiple content : URIs for which the recipient may not have global permission to access the content provider.

If the ClipData contains items that are themselves Intents, any grant flags in those Intents will be ignored. Only the top-level flags of the main Intent are respected, and will be applied to all Uri or Intent items in the clip (or sub-items of the clip).

The MIME type, label, and icon in the ClipData object are not directly used by Intent. Applications should generally rely on the MIME type of the Intent itself, not what it may find in the ClipData. A common practice is to construct a ClipData for use with an Intent with a MIME type of `"*/*"`.

Parameters

clip **ClipData:** The new clip to set. May be null to clear the current clip. This value may be `null`.

setComponent

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setComponent (ComponentName (/reference/android/content/ComponentName) componen
```

(Usually optional) Explicitly set the component to handle the intent. If left with the default value of null, the system will determine the appropriate class to use based on the other fields (action, data, type, categories) in the Intent. If this class is defined, the specified class will always be used regardless of the other fields. You should only set this value when you know you absolutely want a specific class to be used; otherwise it is better to let the system find the appropriate class so that you will respect the installed applications and user preferences.

Parameters

component **ComponentName:** The name of the application component to handle the intent, or null to let the system find one for you. This value may be `null`.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement.

(/reference/android/content/Intent)

See also:

setClass(Context, Class) (/reference/android/content/Intent#setClass(android.content.Context,%20java.lang.Class<?>))

setClassName(Context, String) (/reference/android/content/Intent#setClassName(android.content.Context,%20java.lang.String))

setClassName(String, String) (/reference/android/content/Intent#setClassName(java.lang.String,%20java.lang.String))

getComponent() (/reference/android/content/Intent#getComponent())

resolveActivity(PackageManager) (/reference/android/content/Intent#resolveActivity(android.content.pm.PackageManager))

setData

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setData (Uri (/reference/android/net/Uri) data)
```

Set the data this intent is operating on. This method automatically clears any type that was previously set by **setType(String)**

(/reference/android/content/Intent#setType(java.lang.String)) or **setTypeAndNormalize(String)**

(/reference/android/content/Intent#setTypeAndNormalize(java.lang.String)).

*Note: scheme matching in the Android framework is case-sensitive, unlike the formal RFC. As a result, you should always write your Uri with a lower case scheme, or use **Uri#normalizeScheme** (/reference/android/net/Uri#normalizeScheme()) or **setDataAndNormalize(Uri)** (/reference/android/content/Intent#setDataAndNormalize(android.net.Uri)) to ensure that the scheme is converted to lower case.*

Parameters

data **Uri**: The Uri of the data this intent is now targeting. This value may be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

getData() (/reference/android/content/Intent#getData())

setDataAndNormalize(Uri) (/reference/android/content/Intent#setDataAndNormalize(android.net.Uri))

Uri.normalizeScheme() (/reference/android/net/Uri#normalizeScheme())

setDataAndNormalize

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setDataAndNormalize (Uri (/reference/android/net/Uri) data)
```

Normalize and set the data this intent is operating on.

This method automatically clears any type that was previously set (for example, by [setType\(String\)](#).
(/reference/android/content/Intent#setType(java.lang.String))).

The data Uri is normalized using [Uri.normalizeScheme\(\)](#) (/reference/android/net/Uri#normalizeScheme()) before it is set, so really this is just a convenience method for


```
setData(data.normalize())
```

Parameters

data **Uri:** The Uri of the data this intent is now targeting. This value must never be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

getData() (/reference/android/content/Intent#getData())

setType(String) (/reference/android/content/Intent#setType(java.lang.String))

Uri.normalizeScheme() (/reference/android/net/Uri#normalizeScheme())

setDataAndType

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setDataAndType (Uri (/reference/android/net/Uri) data,  
    String (/reference/java/lang/String) type)
```

(Usually optional) Set the data for the intent along with an explicit MIME data type. This method should very rarely be used -- it allows you to override the MIME type that would ordinarily be inferred from the data with your own type given here.

Note: MIME type and Uri scheme matching in the Android framework is case-sensitive, unlike the formal RFC definitions. As a result, you should always write these elements with lower case letters, or use `normalizeMimeType(String)`.

(/reference/android/content/Intent#normalizeMimeType(java.lang.String)) or `Uri.normalizeScheme()`.

(/reference/android/net/Uri#normalizeScheme()) or `setDataAndTypeAndNormalize(Uri, String)`.

(/reference/android/content/Intent#setDataAndTypeAndNormalize(android.net.Uri,%20java.lang.String)) to ensure that they are converted to lower case.

Parameters

data **Uri:** The Uri of the data this intent is now targeting. This value may be **null**.

type **String:** The MIME type of the data being handled by this intent. This value may be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

`setType(String)`. (/reference/android/content/Intent#setType(java.lang.String))

`setData(Uri)`. (/reference/android/content/Intent#setData(android.net.Uri))

`normalizeMimeType(String)`. (/reference/android/content/Intent#normalizeMimeType(java.lang.String))

[Uri.normalizeScheme\(\)](#) (/reference/android/net/Uri#normalizeScheme())

[setDataAndTypeAndNormalize\(Uri, String\)](#)

(/reference/android/content/Intent#setDataAndTypeAndNormalize(android.net.Uri,%20java.lang.String))

setDataAndTypeAndNormalize

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setDataAndTypeAndNormalize (Uri (/reference/android/net/Uri) data,  
    String (/reference/java/lang/String) type)
```

(Usually optional) Normalize and set both the data Uri and an explicit MIME data type. This method should very rarely be used -- it allows you to override the MIME type that would ordinarily be inferred from the data with your own type given here.

The data Uri and the MIME type are normalize using [Uri.normalizeScheme\(\)](#) (/reference/android/net/Uri#normalizeScheme()) and [normalizeMimeType\(String\)](#) (/reference/android/content/Intent#normalizeMimeType(java.lang.String)) before they are set, so really this is just a convenience method for

```
setDataAndType(data.normalize(), Intent.normalizeMimeType(type))
```

Parameters

data **Uri:** The Uri of the data this intent is now targeting. This value must never be **null**.

type **String:** The MIME type of the data being handled by this intent. This value may be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.

(/reference/android/content/Intent)

See also:

setType(String) (/reference/android/content/Intent#setType(java.lang.String))

setData(Uri) (/reference/android/content/Intent#setData(android.net.Uri))

setDataAndType(Uri, String) (/reference/android/content/Intent#setDataAndType(android.net.Uri,%20java.lang.String))

normalizeMimeType(String) (/reference/android/content/Intent#normalizeMimeType(java.lang.String))

Uri.normalizeScheme() (/reference/android/net/Uri#normalizeScheme())

setExtrasClassLoader

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public void setExtrasClassLoader (ClassLoader (/reference/java/lang/ClassLoader) loader)
```

Sets the ClassLoader that will be used when unmarshalling any Parcelable values from the extras of this Intent.

Parameters

loader **ClassLoader:** a ClassLoader, or null to use the default loader at the time of unmarshalling. This value may be **null**.

setFlags

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setFlags (int flags)
```

Set special flags controlling how this intent is handled. Most values here depend on the type of component being executed by the Intent, specifically the `FLAG_ACTIVITY_*` flags are all for use with [Context#startActivity](#)

(/reference/android/content/Context#startActivity(android.content.Intent)) and the `FLAG_RECEIVER_*` flags are all for use with [Context#sendBroadcast\(Intent\)](#) (/reference/android/content/Context#sendBroadcast(android.content.Intent)).

See the [Tasks and Back Stack](#) (/guide/topics/fundamentals/tasks-and-back-stack) documentation for important information on how some of these options impact the behavior of your application.

Parameters

flags **int**: The desired flags. Value is either `0` or a combination of [FLAG_GRANT_READ_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_READ_URI_PERMISSION), [FLAG_GRANT_WRITE_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_WRITE_URI_PERMISSION), [FLAG_FROM_BACKGROUND](#) (/reference/android/content/Intent#FLAG_FROM_BACKGROUND), [FLAG_DEBUG_LOG_RESOLUTION](#) (/reference/android/content/Intent#FLAG_DEBUG_LOG_RESOLUTION), [FLAG_EXCLUDE_STOPPED_PACKAGES](#) (/reference/android/content/Intent#FLAG_EXCLUDE_STOPPED_PACKAGES), [FLAG_INCLUDE_STOPPED_PACKAGES](#) (/reference/android/content/Intent#FLAG_INCLUDE_STOPPED_PACKAGES), [FLAG_GRANT_PERSISTABLE_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_PERSISTABLE_URI_PERMISSION), [FLAG_GRANT_PREFIX_URI_PERMISSION](#) (/reference/android/content/Intent#FLAG_GRANT_PREFIX_URI_PERMISSION), `android.content.Intent.FLAG_DEBUG_TRIAGED_MISSING`, `android.content.Intent.FLAG_IGNORE_EPHEMERAL`, [FLAG_ACTIVITY_MATCH_EXTERNAL](#) (/reference/android/content/Intent#FLAG_ACTIVITY_MATCH_EXTERNAL), [FLAG_ACTIVITY_NO_HISTORY](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NO_HISTORY), [FLAG_ACTIVITY_SINGLE_TOP](#) (/reference/android/content/Intent#FLAG_ACTIVITY_SINGLE_TOP), [FLAG_ACTIVITY_NEW_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_TASK),

[FLAG_ACTIVITY_MULTIPLE_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_MULTIPLE_TASK),
[FLAG_ACTIVITY_CLEAR_TOP](#) (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TOP),
[FLAG_ACTIVITY_FORWARD_RESULT](#) (/reference/android/content/Intent#FLAG_ACTIVITY_FORWARD_RESULT),
[FLAG_ACTIVITY_PREVIOUS_IS_TOP](#) (/reference/android/content/Intent#FLAG_ACTIVITY_PREVIOUS_IS_TOP),
[FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS](#)
(/reference/android/content/Intent#FLAG_ACTIVITY_EXCLUDE_FROM_RECENTS),
[FLAG_ACTIVITY_BROUGHT_TO_FRONT](#)
(/reference/android/content/Intent#FLAG_ACTIVITY_BROUGHT_TO_FRONT),
[FLAG_ACTIVITY_RESET_TASK_IF_NEEDED](#)
(/reference/android/content/Intent#FLAG_ACTIVITY_RESET_TASK_IF_NEEDED),
[FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY](#)
(/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCHED_FROM_HISTORY),
[FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET](#)
(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET),
[FLAG_ACTIVITY_NEW_DOCUMENT](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NEW_DOCUMENT),
[FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET](#)
(/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_WHEN_TASK_RESET),
[FLAG_ACTIVITY_NO_USER_ACTION](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NO_USER_ACTION),
[FLAG_ACTIVITY_REORDER_TO_FRONT](#) (/reference/android/content/Intent#FLAG_ACTIVITY_REORDER_TO_FRONT)
, [FLAG_ACTIVITY_NO_ANIMATION](#) (/reference/android/content/Intent#FLAG_ACTIVITY_NO_ANIMATION),
[FLAG_ACTIVITY_CLEAR_TASK](#) (/reference/android/content/Intent#FLAG_ACTIVITY_CLEAR_TASK),
[FLAG_ACTIVITY_TASK_ON_HOME](#) (/reference/android/content/Intent#FLAG_ACTIVITY_TASK_ON_HOME),
[FLAG_ACTIVITY_RETAIN_IN_RECENTS](#)
(/reference/android/content/Intent#FLAG_ACTIVITY_RETAIN_IN_RECENTS), [FLAG_ACTIVITY_LAUNCH_ADJACENT](#)
(/reference/android/content/Intent#FLAG_ACTIVITY_LAUNCH_ADJACENT), [FLAG_RECEIVER_REGISTERED_ONLY](#)
(/reference/android/content/Intent#FLAG_RECEIVER_REGISTERED_ONLY), [FLAG_RECEIVER_REPLACE_PENDING](#)
(/reference/android/content/Intent#FLAG_RECEIVER_REPLACE_PENDING), [FLAG_RECEIVER_FOREGROUND](#)
(/reference/android/content/Intent#FLAG_RECEIVER_FOREGROUND), [FLAG_RECEIVER_NO_ABORT](#)
(/reference/android/content/Intent#FLAG_RECEIVER_NO_ABORT),
android.content.Intent.FLAG_RECEIVER_REGISTERED_ONLY_BEFORE_BOOT,
android.content.Intent.FLAG_RECEIVER_BOOT_UPGRADE,
android.content.Intent.FLAG_RECEIVER_INCLUDE_BACKGROUND,
android.content.Intent.FLAG_RECEIVER_EXCLUDE_BACKGROUND,
android.content.Intent.FLAG_RECEIVER_FROM_SHELL, [FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS](#)

(/reference/android/content/Intent#FLAG_RECEIVER_VISIBLE_TO_INSTANT_APPS), and
android.content.Intent.FLAG_RECEIVER_OFFLOAD

Returns

Intent (/reference/android/content/Intent) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.

See also:

getFlags() (/reference/android/content/Intent#getFlags())

addFlags(int) (/reference/android/content/Intent#addFlags(int))

removeFlags(int) (/reference/android/content/Intent#removeFlags(int))

setIdentifier

Added in [API level 29](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent setIdentifier (String identifier)
```

Set an identifier for this Intent. If set, this provides a unique identity for this Intent, allowing it to be unique from other Intents that would otherwise look the same. In particular, this will be used by [`filterEquals\(android.content.Intent\)`](/reference/android/content/Intent#filterEquals(android.content.Intent))

(/reference/android/content/Intent#filterEquals(android.content.Intent)) to determine if two Intents are the same as with other fields like [`setAction\(String\)`](/reference/android/content/Intent#setAction(java.lang.String)) (/reference/android/content/Intent#setAction(java.lang.String)). However, unlike those fields, the identifier is *never* used for matching against an [`IntentFilter`](/reference/android/content/IntentFilter) (/reference/android/content/IntentFilter); it is as if the identifier has not been set on the Intent.

This can be used, for example, to make this Intent unique from other Intents that are otherwise the same, for use in creating a **PendingIntent** (</reference/android/app/PendingIntent>). (Be aware however that the receiver of the PendingIntent will see whatever you put in here.) The structure of this string is completely undefined by the platform, however if you are going to be exposing identifier strings across different applications you may need to define your own structure if there is no central party defining the contents of this field.

Parameters

identifier **String:** The identifier for this Intent. The contents of the string have no meaning to the system, except whether they are exactly the same as another identifier. This value may be **null**.

Returns

Intent (</reference/android/content/Intent>) Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.

See also:

[getIdentifier\(\)](/reference/android/content/Intent#getIdentifier()) ([/reference/android/content/Intent#getIdentifier\(\)](/reference/android/content/Intent#getIdentifier()))

setPackage

Added in [API level 4](/guide/topics/manifest/uses-sdk-element#ApiLevels) (</guide/topics/manifest/uses-sdk-element#ApiLevels>)

```
public Intent (Intent) setPackage (String packageName)
```

(Usually optional) Set an explicit application package name that limits the components this Intent will resolve to. If left to the default value of null, all components in all applications will considered. If non-null, the Intent can only match the components in the given

application package.

Parameters

packageName **String:** The name of the application package to handle the intent, or null to allow any application package. This value may be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement.
(/reference/android/content/Intent)

See also:

getPackage() (/reference/android/content/Intent#getPackage())

resolveActivity(PackageManager) (/reference/android/content/Intent#resolveActivity(android.content.pm.PackageManager))

setSelector

Added in [API level 15](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public void setSelector (Intent (/reference/android/content/Intent) selector)
```

Set a selector for this Intent. This is a modification to the kinds of things the Intent will match. If the selector is set, it will be used when trying to find entities that can handle the Intent, instead of the main contents of the Intent. This allows you build an Intent containing a generic protocol while targeting it more specifically.

An example of where this may be used is with things like [CATEGORY_APP_BROWSER](#) ([/reference/android/content/Intent#CATEGORY_APP_BROWSER](#)). This category allows you to build an Intent that will launch the Browser application. However, the correct main entry point of an application is actually [ACTION_MAIN](#) ([/reference/android/content/Intent#ACTION_MAIN](#)) [CATEGORY_LAUNCHER](#) ([/reference/android/content/Intent#CATEGORY_LAUNCHER](#)) with [setComponent\(android.content.ComponentName\)](#) ([/reference/android/content/Intent#setComponent\(android.content.ComponentName\)](#)) used to specify the actual Activity to launch. If you launch the browser with something different, undesired behavior may happen if the user has previously or later launches it the normal way, since they do not match. Instead, you can build an Intent with the MAIN action (but no ComponentName yet specified) and set a selector with [ACTION_MAIN](#) ([/reference/android/content/Intent#ACTION_MAIN](#)) and [CATEGORY_APP_BROWSER](#) ([/reference/android/content/Intent#CATEGORY_APP_BROWSER](#)) to point it specifically to the browser activity.

Setting a selector does not impact the behavior of [filterEquals\(android.content.Intent\)](#) ([/reference/android/content/Intent#filterEquals\(android.content.Intent\)](#)) and [filterHashCode\(\)](#) ([/reference/android/content/Intent#filterHashCode\(\)](#)). This is part of the desired behavior of a selector -- it does not impact the base meaning of the Intent, just what kinds of things will be matched against it when determining who can handle it.

You can not use both a selector and [setPackage\(java.lang.String\)](#) ([/reference/android/content/Intent#setPackage\(java.lang.String\)](#)) on the same base Intent.

Parameters

selector **Intent:** The desired selector Intent; set to null to not use a special selector. This value may be **null**.

setSourceBounds

Added in [API level 7](#) ([/guide/topics/manifest/uses-sdk-element#ApiLevels](#))

```
public void setSourceBounds (Rect (/reference/android/graphics/Rect) r)
```

Set the bounds of the sender of this intent, in screen coordinates. This can be used as a hint to the receiver for animations and the like. Null means that there is no source bounds.

Parameters

r **Rect:** This value may be **null**.

setType

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setType (String (/reference/java/lang/String) type)
```

Set an explicit MIME data type.

This is used to create intents that only specify a type and not data, for example to indicate the type of data to return.

This method automatically clears any data that was previously set (for example by [setData\(Uri\)](#) (/reference/android/content/Intent#setData(android.net.Uri))).

Note: MIME type matching in the Android framework is case-sensitive, unlike formal RFC MIME types. As a result, you should always write your MIME types with lower case letters, or use [normalizeMimeType\(String\)](#)

(/reference/android/content/Intent#normalizeMimeType(java.lang.String)) or [setTypeAndNormalize\(String\)](#)

(/reference/android/content/Intent#setTypeAndNormalize(java.lang.String)) to ensure that it is converted to lower case.

Parameters

type **String:** The MIME type of the data being handled by this intent. This value may be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

getType() (/reference/android/content/Intent#getType())

setTypeAndNormalize(String) (/reference/android/content/Intent#setTypeAndNormalize(java.lang.String))

setDataAndType(Uri, String) (/reference/android/content/Intent#setDataAndType(android.net.Uri,%20java.lang.String))

normalizeMimeType(String) (/reference/android/content/Intent#normalizeMimeType(java.lang.String))

setTypeAndNormalize

Added in [API level 16](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public Intent (/reference/android/content/Intent) setTypeAndNormalize (String (/reference/java/lang/String) type)
```

Normalize and set an explicit MIME data type.

This is used to create intents that only specify a type and not data, for example to indicate the type of data to return.

This method automatically clears any data that was previously set (for example by [setData\(Uri\)](#) (/reference/android/content/Intent#setData(android.net.Uri))).

The MIME type is normalized using [normalizeMimeType\(String\)](#) (/reference/android/content/Intent#normalizeMimeType(java.lang.String)) before it is set, so really this is just a convenience method for

```
setType(Intent.normalizeMimeType(type))
```

Parameters

type **String:** The MIME type of the data being handled by this intent. This value may be **null**.

Returns

Intent Returns the same Intent object, for chaining multiple calls into a single statement. This value will never be **null**.
(/reference/android/content/Intent)

See also:

getType() (/reference/android/content/Intent#getType())

setData(Uri) (/reference/android/content/Intent#setData(android.net.Uri))

normalizeMimeType(String) (/reference/android/content/Intent#normalizeMimeType(java.lang.String))

toString

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String (/reference/java/lang/String) toString ()
```

Returns a string representation of the object. In general, the `toString` method returns a string that "textually represents" this object. The result should be a concise but informative representation that is easy for a person to read. It is recommended that all subclasses override this method.

The `toString` method for class `Object` returns a string consisting of the name of the class of which the object is an instance, the at-sign character `@`, and the unsigned hexadecimal representation of the hash code of the object. In other words, this method returns a string equal to the value of:

```
getClass().getName() + '@' + Integer.toHexString(hashCode())
```

Returns

String a string representation of the object.
(/reference/java/lang/String)

toURI

Added in [API level 1](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

Deprecated in [API level 15](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String toURI ()
```

This method was deprecated in API level 15.

Use [`toUri\(int\)`](/reference/android/content/Intent#toUri(int)) instead.

Call [`toUri\(int\)`](/reference/android/content/Intent#toUri(int)) with 0 flags.

Returns

String

(/reference/java/lang/String)

toUri

Added in [API level 4](/guide/topics/manifest/uses-sdk-element#ApiLevels) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public String toUri (int flags)
```

Convert this Intent into a String holding a URI representation of it. The returned URI string has been properly URI encoded, so it can be used with [**Uri#parse**](/reference/android/net/Uri#parse(java.lang.String)) (/reference/android/net/Uri#parse(java.lang.String)). The URI contains the Intent's data as the base URI, with an additional fragment describing the action, categories, type, flags, package, component, and extras.

You can convert the returned string back to an Intent with [**getIntent\(String\)**](#).

(/reference/android/content/Intent#getIntent(java.lang.String)).

Parameters

flags

int: Additional operating flags. Value is either 0 or a combination of [**URI_ALLOW_UNSAFE**](#) (/reference/android/content/Intent#URI_ALLOW_UNSAFE), [**URI_ANDROID_APP_SCHEME**](#) (/reference/android/content/Intent#URI_ANDROID_APP_SCHEME), and [**URI_INTENT_SCHEME**](#) (/reference/android/content/Intent#URI_INTENT_SCHEME)

Returns

String

(/reference/java/lang/String)

Returns a URI encoding URI string describing the entire contents of the Intent.

writeToParcel

Added in [API level 1](#) (/guide/topics/manifest/uses-sdk-element#ApiLevels)

```
public void writeToParcel (Parcel (/reference/android/os/Parcel) out,  
                           int flags)
```

Flatten this object in to a Parcel.

Parameters

out	Parcel : The Parcel in which the object should be written.
flags	int : Additional flags about how the object should be written. May be 0 or Parcelable.PARCELABLE_WRITE_RETURN_VALUE (/reference/android/os/Parcelable#PARCELABLE_WRITE_RETURN_VALUE). Value is either 0 or a combination of Parcelable.PARCELABLE_WRITE_RETURN_VALUE (/reference/android/os/Parcelable#PARCELABLE_WRITE_RETURN_VALUE), and android.os.Parcelable.PARCELABLE_ELIDE_DUPLICATES

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Last updated 2020-02-12.

EXHIBIT 10

```
1 /*
2  * Copyright (C) 2006 The Android Open Source Project
3  *
4  * Licensed under the Apache License, Version 2.0 (the "License");
5  * you may not use this file except in compliance with the License.
6  * You may obtain a copy of the License at
7  *
8  *     http://www.apache.org/licenses/LICENSE-2.0
9  *
10 * Unless required by applicable law or agreed to in writing, software
11 * distributed under the License is distributed on an "AS IS" BASIS,
12 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
13 * See the License for the specific language governing permissions and
14 * limitations under the License.
15 */
16
17 package android.text.style;
18
19 import android.content.ActivityNotFoundException;
20 import android.content.Context;
21 import android.content.Intent;
22 import android.net.Uri;
23 import android.os.Parcel;
24 import android.provider.Browser;
25 import android.text.ParcelableSpan;
26 import android.text.TextUtils;
27 import android.util.Log;
28 import android.view.View;
29
30 public class URLSpan extends ClickableSpan implements ParcelableSpan {
31
32     private final String mURL;
33
34     public URLSpan(String url) {
35         mURL = url;
36     }
37
38     public URLSpan(Parcel src) {
39         mURL = src.readString();
40     }
41
42     public int getSpanTypeId() {
43         return getSpanTypeIdInternal();
44     }
45
46     /** @hide */
47     public int getSpanTypeIdInternal() {
48         return TextUtils.URL_SPAN;
49     }
50
51     public int describeContents() {
52         return 0;
53     }
54
55     public void writeToParcel(Parcel dest, int flags) {
56         writeToParcelInternal(dest, flags);
57     }
58
59     /** @hide */
```

```
60 public void writeToParcel(Parcel dest, int flags) {
61     dest.writeString(mURL);
62 }
63
64 public String getURL() {
65     return mURL;
66 }
67
68 @Override
69 public void onClick(View widget) {
70     Uri uri = Uri.parse(getURL());
71     Context context = widget.getContext();
72     Intent intent = new Intent(Intent.ACTION_VIEW, uri);
73     intent.putExtra(Browser.EXTRA_APPLICATION_ID, context.getPackageName());
74     try {
75         context.startActivity(intent);
76     } catch (ActivityNotFoundException e) {
77         Log.w("URLSpan", "Activity was not found for intent, " + intent.toString());
78     }
79 }
80 }
81
```

EXHIBIT 11
LODGED WITH THE COURT

EXHIBIT 12

**REDACTED IN ITS
ENTIRETY**

EXHIBIT 13



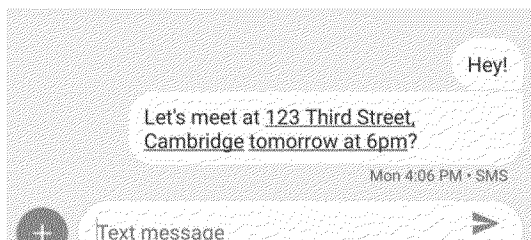
The latest news from Google AI

The Machine Learning Behind Android Smart Linkify

Thursday, August 9, 2018

Posted by Lukas Zilka, Software Engineer, Google AI, Zürich

Earlier this week we launched Android 9 Pie, the latest release of Android that uses machine learning to make your phone simpler to use. One of the features in Android 9 is Smart Linkify, a new API that adds clickable links when certain types of entities are detected in text. This is useful when, for example, you receive an address from a friend in a messaging app and want to look it up on a map. With a Smart Linkify-annotated text, it's a lot easier!



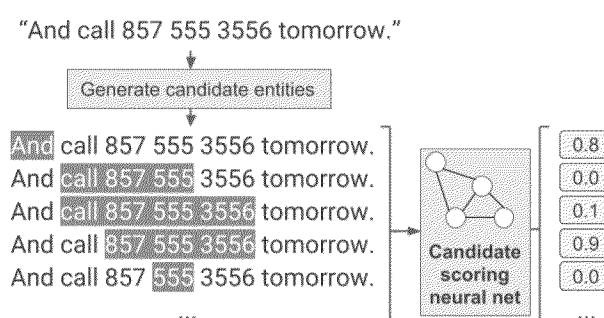
Smart Linkify is a new version of the existing Android Linkify API. It is powered by a small feed-forward neural network (500kB per language) with low latency (less than 20ms on Google Pixel phones) and small inference code (250kB), and uses essentially the same machine learning technology that powers Smart Text Selection (released as part of Android Oreo) to now also create links.

Smart Linkify is available as an open-source TextClassifier API in Android (as the generateLinks method). The models were trained using TensorFlow and exported to a custom inference library backed by TensorFlow Lite and FlatBuffers. The C++ inference library for the models is available as part of Android Open-Source framework here, and runs on each text selection and Smart Linkify API calls.

Finding Entities

Looking for phone numbers and postal addresses in text is a difficult problem. Not only are there many variations in how people write them, but it's also often ambiguous what type of entity is being represented (e.g. "Confirmation number: 857-555-3556" is not a phone number even though it takes a similar form to one). As a solution, we designed an inference algorithm with two small feedforward neural networks at its heart. This algorithm is general enough to perform all kinds of entity chunking beyond just addresses and phone numbers.

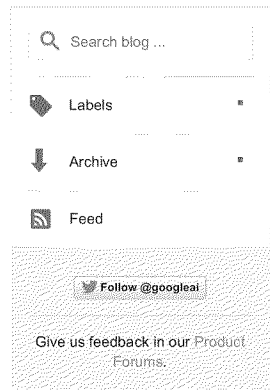
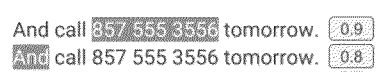
Overall, the system architecture is as follows: A given input text is first split into words (based on space separation), then all possible word subsequences of certain maximum length (15 words in our case) are generated, and for each candidate the scoring neural net assigns a value (between 0 and 1) based on whether it represents a valid entity:

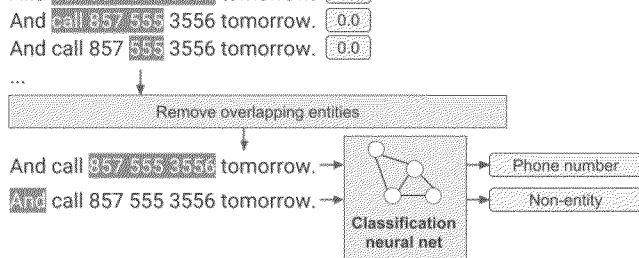


For the given text string, the first network assigns low scores to non-entities and a high score for the candidate that correctly selects the whole phone number.

Next, the generated entities that overlap are removed, favoring the ones with the higher score over the conflicting ones with a lower score. Now, we have a set of entities, but still don't know their types. So now the second neural network is used to classify the type of the entity, as either a phone number, address or in some cases, a non-entity.

In our example, the only non-conflicting entities are "And call 857 555 3556 tomorrow." (with "857 555 3556" classified as a phone number), and "And call 857 555 3556 tomorrow." (with "And" classified as a non-entity).



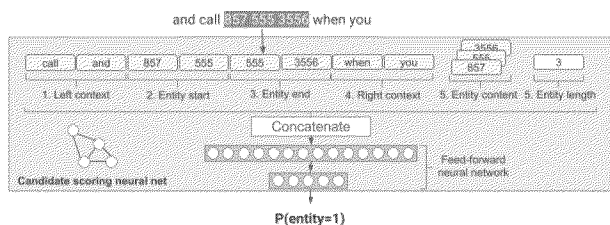


Now that we have the only non-conflicting entities, "And call 857 555 3556 tomorrow." (with "857 555 3556" classified as a phone number) and "And call 857 555 3556 tomorrow." (with "And" classified as a non-entity), we are easily able to underline them in the displayed text on the screen, and run the right app when clicked.

Textual Features

So far, we've given a general description of the way Smart Linkify locates and classifies entities in a string of text. Here, we go into more detail on how the text is processed and fed to the network.

The task of the networks, given an entity candidate in the input text, is to determine whether the entity is valid, and then to classify it. To do this, the networks need to know the context surrounding the entity (in addition to the text string of the entity itself). In machine learning this is done by representing these parts as separate features. Effectively, the input text is split into several parts that are fed to the network separately:



Given a candidate entity span, we extract: Left context: five words before the entity, Entity start: first three words of the entity, Entity end: last three words of the entity (they can be duplicated with the previous feature if they overlap, or padded if there are not that many), Right context: five words after the entity, Entity content: bag of words inside the entity and Entity length: size of the entity in number of words. They are then concatenated together and fed as an input to the neural network.

The feature extraction operates with words, and we use character n-grams and a capitalization feature to represent the individual words as real vectors suitable as an input of the neural network:

- *Character N-grams.* Instead of using the standard word embedding technique for representing words, which keeps a separate vector for each word in the model and thus would be infeasible for mobile devices because of their large storage size, we use the hashed charactergram embedding. This technique represents the word as a set of all character subsequences of certain length. We use lengths 1 to 5. These strings are additionally hashed and mapped to a fixed number of buckets (see here for more details on the technique). As a result, the final model only stores vectors for each of the hash buckets, not each word/character subsequence, and can be kept small. The embedding matrix for the hashed charactergrams that we use has 20,000 buckets and 12 dimensions.
- *A binary feature that indicates whether the word starts with a capital letter.* This is important for the network to know because the capitalization in postal addresses is quite distinct, and helps the networks to discriminate.

A Training Dataset

There is no obvious dataset for this task on which we could readily train the networks, so we came up with a training algorithm that generates synthetic examples out of realistic pieces. Concretely, we gathered lists of addresses, phone numbers and named entities (like product, place and business names) and other random words from the Web (using Schema.org annotations), and use them to synthesize the training data for the neural networks. We take the entities as they are and generate random textual contexts around them (from the list of random words on Web). Additionally, we add phrases like "Confirmation number:" or "ID:" to the negative training data for phone numbers, to teach the network to suppress phone number matches in these contexts.

Making it Work

There are a number of additional techniques that we had to use for training the network and making a practical mobile deployment:

- Quantizing the embedding matrix to 8 bits. We found that we could reduce the size of the model almost 4x without compromising the performance, by quantizing the embedding matrix values to 8-bit integers.
- Sharing embedding matrices between the selection and classification networks. This brings almost no loss and makes the model 2x smaller.
- Varying the size of the context before/after the entities. On mobile screens text is often short, with not enough context, so the network needs to be exposed to this during training as well.
- Creating artificial negative examples out of the positive ones for the classification network. For example for the positive example: "call me 857 555 3556 today" with a label "phone" we generate "call me 857 555 3556 today" as a negative example with a label "other". This teaches the classification network to be more precise about the entity span. Without doing this, the network would be merely a detector whether there is a phone number somewhere in the input, regardless of the span.

Internationalization is Important

The automatic data extraction we use makes it easier to train language-specific models. However, making them work for all languages is a challenge, requiring careful checking of language nuance by experts, as well as having an acceptable amount of training data. We found that having one model for all Latin-script languages works well (e.g. Czech, Polish, German, English), with individual models for each of Chinese, Japanese, Korean, Thai, Arabic and Russian. While Smack Linkify currently supports 16 languages, we are experimenting with models that support even more languages, which is especially challenging given the mobile model size constraints and trickiness with languages that do not split words on spaces.

Next Steps

While the technique described in this post enables the fast and accurate annotation of phone numbers and postal addresses in text, the recognition of flight numbers, date and time, or IBAN, is currently implemented with a more traditional technique using standard regular expressions. However, we are looking into creating ML models for date and time as well, particularly for recognizing informal relative date/time specifications prevalent in messaging context, like "next Thursday" or "in 3 weeks".

The small model and binary size as well as low latency are very important for mobile deployment. The models and the code we developed are available open-source as part of Android framework. We believe that the architecture could extend to other on-device text annotation problems and we look forward to seeing new use cases from our developer community!

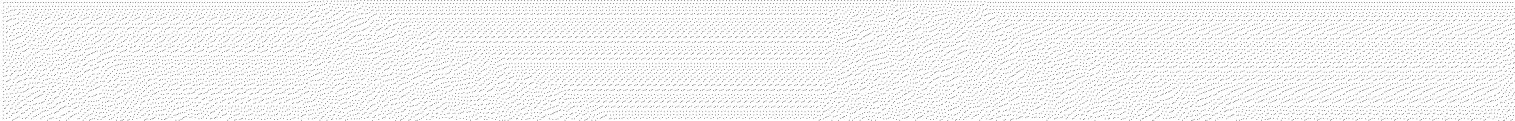


EXHIBIT 14

**REDACTED IN ITS
ENTIRETY**

EXHIBIT 15

**REDACTED IN ITS
ENTIRETY**