PDF for Prepress Workflow and Document Delivery

Adobe PDF

Adobe° Acrobat° for the print publishing market today

Adobe Systems Incorporated was founded on the development of what is now called the Adobe imaging model. This imaging model is a powerful way to represent text, graphics, and images in a coherent and consistent manner. It was originally implemented in the PostScript printing language and is now at the core of Adobe's wide range of printing and publishing technologies, including PostScript, Adobe's Portable Document Format (PDF), and application products such as Adobe PageMaker° and Adobe Acrobat.

Adobe PostScript is both the page description language that describes the format of a printed page, and the system that understands that language and converts it into the pixels that are imaged onto output media. As a general-purpose programming language, PostScript contains procedures, variables, and control constructs that must be interpreted to render its page description. This processing is required to be in sequential order such that PostScript files are streamed into an output device from the first byte to the last. This also means that PostScript files are not inherently page independent, such that the imaging operations performed on the last page of a document may depend on graphics state settings that have accumulated since the first page.

The Adobe PostScript language has become the standard printing technology for producing high-quality output. Central to the success of Adobe's PostScript product is the fact that it is a completely device-independent page description language. This means that the same file can be printed on desktop laser printers that cost a few hundred dollars or on high-end printing systems that cost hundreds of thousands of dollars, and the document will always print with the highest quality achievable by the particular output device.

Adobe Acrobat software, which is based on an Adobe imaging model similar to that of PostScript, was developed so that users could view and manage documents on-screen in a device- and application-independent manner. With Acrobat, documents can be created in virtually any application, on any platform, and easily converted to PDF, where they retain the full range of high-quality typography, graphics, images, and color. PDF files can be viewed, navigated, searched, printed, and archived in Macintosh, Windows,° and UNIX° environments using the free Adobe Acrobat software (available on Adobe's Web site).

The biggest issues facing prepress shops are predictability, reliability, and consistency of workflow. Most documents are delivered to prepress or print shops today in the authoring application format. Once received, the file enters a workflow process based on the Adobe PostScript language or proprietary formats. Adobe PostScript technology was initially developed as a language for describing pages and controlling printers, but its flexibility enabled it to become the data format for carrying all prepress and production information. With PostScript technology's flexibility can come unpredictability, in part because so many different applications generate PostScript in so many different ways and PostScript page descriptions can be arbitrarily complex. A typical imposition application may have to understand 200 or more different application versions of PostScript output. It is not uncommon for prepress application developers to spend half of their development time just keeping up with the latest application output streams.

Adobe

Typical Prepress Workflow Based on AdobePostScript
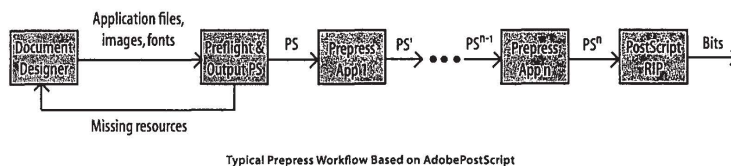
Another characteristic of PostScript language-based prepress workflow is that each prepress application must read in the entire PostScript file to understand its contents before being able to act on that file. Once any changes/updates are made, a new PostScript file is streamed out of the application. This is a very memory-intensive operation. Production workflows built around PostScript technology have to deal with both the complexity of the desired product and the apparent arbitrariness of the data stream.

In contrast, PDF files are highly structured and general programming constructs are not permitted. As a result, the imaging operations are usually much simpler. A PDF file can be thought of as a database of objects with direct access to each object, and each page of a PDF document is independent of the others. If a prepress application uses PDF files instead of the PostScript language as its input and output, it is able to directly access only the information needed and incrementally update the file. The prepress application also has just one format to understand—PDF. The apparent arbitrariness of PostScript technology is eliminated, so PDF provides the foundation for a print production system that delivers consistent, predictable results.

Prior to the definition of the PDF format used in Acrobat 3.0, many of the high-end printing features that PostScript language files can represent were not retained. New to the PDF format is the ability to describe high-end printing controls and printed integrity available in the PostScript language. In addition, Adobe Acrobat 3.0 adds new features to the Acrobat application products to enable the creation of the new PDF format files and add value to them.

Why Adobe Acrobat 3.0 for the print publishing market?

Acrobat 3.0 includes the features necessary for PDF files to work seamlessly in production printing for color and monochrome workflows. When high-end printing controls are specified in the PostScript language output of an authoring application, they are retained in the PDF file when converted by Acrobat Distiller, one of the components of Acrobat 3.0. PDF files can also be written directly from other systems. Regardless of where the PDF file comes from, once the features are specified inside the PDF file, they are output back into the PostScript language stream at print time. This happens automatically in Acrobat 3.0 and can be implemented inside any system that consumes and outputs PDF files directly.

The following are features new to Acrobat 3.0:

Portable Document Format

There are two new color spaces built into the PDF file format used in Acrobat 3.0 that are already part of the PostScript language. A separation color space can be specified for any separations (spot colors) to be produced by a given device. If the output device does not support the specified separation, it will use an alternate color space (specified in the PDF file) for predictable behavior. A second new color space, the pattern color space, allows the printing of PostScript language patterns.

The graphics state set in a PDF file has been extended to include some device-dependent parameters. This "extended graphics state" allows the specification of stroke adjustment, overprinting, black generation, undercolor removal, transfer functions, halftone screens, and halftone phase.

Open Prepress Interface (OPI) comments in version 1.3 will be maintained in PDF files, enabling OPI image replacement. Very large high-resolution images can be stored separately from the PDF file itself, allowing small files to be maintained and routed with the large images replaced at print time.

The Japanese version of Acrobat 3.0 is now available on the Macintosh and Windows® 95, and Windows NT® platforms. TrueType and PostScript language Japanese fonts are supported. Cross-platform, encoding-independent documents containing Japanese text are achieved through the internal use of Adobe's new CID (Character Identifier)-keyed font technology.

Acrobat Distiller

When a PDF file is created from a PostScript language file by using Acrobat Distiller software, the above features can be retained within the PDF file. The Distiller user interface gives the user control over which features to retain in the PDF file and what color conversions to apply.

Adobe Acrobat Exchange™ and Acrobat Reader

Most of the new PDF file format features described above relate specifically to how a document should print, not how it is viewed on-screen. As such, Adobe Acrobat does not use most of this information for displaying a PDF file.

New to Acrobat Exchange for the Macintosh, a component of Acrobat 3.0, is an Export PostScript or EPS menu item. This option enables users to output an EPS file and maintain the information necessary to do color separations in the importing application—such as Adobe PageMaker, Adobe Illustrator,® or QuarkXPress.®

If a typo is found in a document shortly before it goes to press, and the appropriate font is on the system, it can be corrected in Acrobat Exchange using the touch-up plug-in for simple text editing, before being output to a PostScript device.

Once the high-end PDF features are stored in the PDF file through Acrobat Distiller, they are output again when printing to PostScript from Acrobat Exchange or Reader. This means that if users specify screening in authoring applications, the information will be embedded inside the PDF file with the Distiller, ignored when viewed, and then output again as part of the PostScript technology stream at print time.

How will print publishing customers use this functionality?

One way in which many service bureaus are using PDF is to build predictable PostScript language files to either print directly or put through a prepress workflow. When an application file enters their shop, they use the authoring application to output it to the PostScript language, convert it to PDF using the Acrobat Distiller 3.0, view it as a soft proof, and then output to the PostScript language using Acrobat Exchange 3.0. What results is a reliable PostScript file ready to be RIPed or processed by a prepress application. This process is particularly helpful when PostScript files are received for printing and the driver used in the creation of the file does not match the device configuration of the final output device. The process of going to PDF and then back to PostScript technology enables the service bureau to better control the creation of the PostScript language file.

As more users become familiar with the benefits of Acrobat and more applications support Acrobat, production printers will standardize on PDF as the delivery mechanism for documents headed for print. They will request PDF files from their customers instead of asking for the authoring application format or PostScript files. Some of the benefits of using PDF files for document delivery (for both the document creator and prepress/printer) are:

- Small file size (PDF files use industry-standard compression algorithms and are often significantly smaller than the equivalent PostScript language file or application file).
- Fonts, images, and graphics are contained within the document, streamlining electronic transmission and preflighting.
- PDF files are independent of the platform, operating system, and authoring application, and are viewable on-screen in Macintosh, Windows, and UNIX environments.
- One consistent, predictable, reliable format can be used for all documents.
- Late-stage text edits can be made before going to print.
- PDF files are ideal for archiving and retrieval.

Here's a typical scenario of using PDF for document delivery that can be used today: a graphic designer creates a document in a page layout program, includes the FPO (for placement only) images received from the print shop (which they scanned from photos), and then outputs the document to a PDF file. Any printing control features specified in the authoring application are maintained. OPI comments specified in the PostScript file are included in the PDF file so high-resolution images can be added back into the file before going to press. The (small) PDF file is then transmitted to the print shop, reducing the time and effort it takes to transfer. When the PDF file is received at the print shop, initial preflight is streamlined because all of the components are in one neat package and viewable on-screen. Any last-minute text edits are made. The document is generally output to a PostScript language file at this stage, maintaining the print controls originally specified in the authoring application. It is routed through a prepress workflow, high-resolution images that remained at the print shop are replaced in the file, and then it is output to final print.

Today's Prepress Workflow
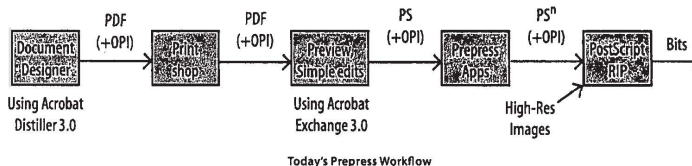
Another benefit to delivering documents as PDF files is that a PostScript file that has been created from PDF tends to print more reliably than the original PostScript file. In the conversion to PDF, the *arbitrariness* is removed from the file, so that when it is converted back to PostScript technology it is more tightly structured.

The Associated Press AdSEND Project
The Associated Press (AP) operates a digital advertising delivery service called AP AdSEND. The AP delivers ads via satellite to newspapers throughout the United States using Adobe Acrobat software. Using PDF provides tremendous advantages for retailers and advertising agencies because of the cost savings, ability to make important last-minute changes, faster time to market, and higher reproduction quality.

At present, the AdSEND project includes more than 1,300 newspapers receiving ads by AdSEND; more than 400 major advertisers under contract to use AdSEND; more than 100,000 full-page ads per month; and 7,000 ads per day at peak times. These ads are all delivered as PDF files.

This year, AP AdSEND added full color support and service the magazine ad market as well. In addition, newspapers that receive PDF ads will use the "Export to EPS" feature of Acrobat Exchange to incorporate PDF ads into page layouts. This capability eliminates the need for many of the manual production processes where errors are likely to occur. Combining PDF ads directly in a page layout can result in a substantial cost savings to newspapers, because doing so can eliminate errors and the need to offer rebates or make good on misrun ads.

What the future will bring
The ability for customers to deliver their documents as PDF files to their print shop is a great first step, but the future of PDF in print production goes much further. For example, the structural properties of PDF files make them very attractive for the kind of work done in prepress production. At present, PostScript files are read and written at each stage of the process. Because PDF files can be incrementally updated, device-specific information such as traps and page placement for imposition could be added to a PDF file throughout the process without the need to recreate the entire file.

In the future, content creation applications will support placing PDF files as objects in a page-layout program. With the new Placed PDF capability, users will be able to output from content creation applications directly to PDF, without the intermediate step of exporting to PostScript. Placed PDF capability will further promote the use of PDF files instead of, for example, EPS files.
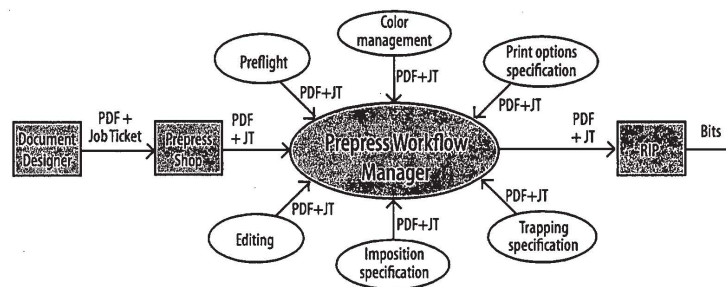
Workflow of the future

A graphic designer creates a document in a page layout program, and then saves it directly to PDF. The designer specifies post-press options in a PDF job ticket and then transfers the PDF file and job ticket to the print shop. The file is small, because it does not contain the high-resolution images that will be used in final print. They may be sent separately or scanned by the print shop and stored on a central file server.

When the job arrives at the print shop, a workflow manager automatically reads the job ticket and redirects it for processing based on output requirements, priority, and so on. The file is automatically routed to a preflighting station, where a report is generated listing all the fonts, images, graphics, document components, and the approximate print time. The prepress operator views the PDF file in Adobe Acrobat, specifies bleeds, and adjusts the imaged region on the media.

Next, color correction is applied to the PDF file, or individual images, as necessary. The file may be tagged with the proper ICC profile for both proofing and/or final output. Was there a last-minute change to a price or a phone number in the document? Late-stage edits can be made to text and image placement. Still working in Adobe Acrobat, screening is specified, spot colors are mapped to process (or other spots), and separations are created with the proper undercolor removal and black-generation settings. Much of this process is automated by the workflow manager as directed in the job ticket.

The PDF file is imposed for final output, and a signature is previewed before committing it to costly film or plates. The high-resolution images are replaced in the document. Next, the prepress operator applies trapping (or specifies trapping controls, and the trapping occurs in the RIP). Finally, post-press operations are specified for the job before final output.

PDF Workflow of the Future

This entire workflow can be done using a PDF file instead of a PostScript or proprietary format file. The size of the file being routed is small, it can be viewed at any time or archived for later use, and printing errors are almost nonexistent.

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

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Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

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Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.