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UNIX® SYSTEM V RELEASE 4

User's Guide

Printed in USA

Published by Prentice-Hall, Inc.
A Division of Simon & Schuster
Englewood Cliffs, New Jersey 07632

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10 9 8 7 6 5 4 3 2

ISBN 0-13-947052-2

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If the –w or –c option had been specified instead, the command would have reported the number of words or characters, respectively, in the file.

Figure 3-21 summarizes the syntax and capabilities of the wc command.

Figure 3-21: Summary of the wc Command

Command Recap wc – count lines, words, and characters in a file		
command	*options*	*arguments*
wc	–l, –w, –c	*file(s)*
Description:	wc counts lines, words, and characters in the specified file(s), keeping a total count of all tallies when more than one file is specified.	
Options	–l counts the number of lines in the specified file(s)	
	–w counts the number of words in the specified file(s)	
	–c counts the number of characters in the specified file(s)	
Remarks:	When a file name is specified in the command line, it is printed with the count(s) requested.	

Protecting Your Files: the chmod Command

The command chmod (short for change mode) allows you to decide who can read, write, and use your files and who cannot. Because the UNIX operating system is a multi-user system, you usually do not work alone in the file system. System users can follow path names to various directories and read and use files belonging to one another, as long as they have permission to do so.

If you own a file, you can decide who has the right to read it, write in it (make changes to it), or, if it is a program, to execute it. You can also restrict permissions for directories with the `chmod` command. When you grant execute permission for a directory, you allow the specified users to `cd` to it and list its contents with the `ls` command.

To assign these types of permissions, use the following three symbols:

`r`	allows system users to read a file or to copy its contents
`w`	allows system users to write changes into a file (or a copy of it)
`x`	allows system users to run an executable file

To specify the users to whom you are granting (or denying) these types of permission, use these three symbols:

`u`	you, the owner of your files and directories (`u` is short for user)
`g`	members of the group to which you belong (the group could consist of team members working on a project, members of a department, or a group arbitrarily designated by the person who set up your UNIX system account)
`o`	all other system users

When you create a file or a directory, the system automatically grants or denies permission to you, members of your group, and other system users. You can alter this automatic action by modifying your environment (see Chapter 9 for details). Moreover, regardless of how the permissions are granted when a file is created, as the owner of the file or directory you always have the option of changing them. For example, you may want to keep certain files private and reserve them for your exclusive use. You may want to grant permission to read and write changes into a file to members of your group and all other system users as well. Or you may share a program with members of your group by granting them permission to execute it.

How to Determine Existing Permissions

You can determine what permissions are currently in effect on a file or a directory by using the command that produces a long listing of a directory's contents: `ls -l`. For example, typing `ls -l` and pressing the `RETURN` key while in the directory named `starship/bin` in the sample file system produces the following output:

```
$ ls -l<CR>
total 35
-rwxr-xr-x   1 starship     project        9346  Nov 1  08:06  display
-rw-r--r--   1 starship     project        6428  Dec 2  10:24  list
drwx--x--x   2 starship     project          32  Nov 8  15:32  tools
$
```

Permissions for the `display` and `list` files and the `tools` directory are shown on the left of the screen under the line `total 35`, and appear in this format:

`-rwxr-xr-x`	(for the `display` file)
`-rw-r--r--`	(for the `list` file))
`drwx--x--x`	(for the `tools` directory)

After the initial character, which describes the file type (for example, a – (dash) symbolizes a regular file and a `d` a directory), the other nine characters that set the permissions comprise three sets of three characters. The first set refers to permissions for the owner, the second set to permissions for group members, and the last set to permissions for all other system users. Within each set of characters, the `r`, `w`, and `x` show the permissions currently granted to each category. If a dash appears instead of an `r`, `w`, or `x`, permission to read, write, or execute is denied.

The following diagram summarizes this breakdown for the file named `display`.

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