CHAPTER 7
Documentation

Objectives

An abundance of documentation exists for Linux, both on a Linux system itself and online. In this chapter we will work with the **man** and **info** commands which provide access to invaluable system documentation. Large amounts of documentation can also be found online on project web sites, such as the Samba web site (*http://www.samba.org*) as well as the definitive online source for Linux documentation: The Linux Documentation Project. At the end of this chapter, you should be able to:

- Use the **man** command
- Use the **info** command
- Identify and locate system documentation
- Identify and use online documentation such as The Linux Documentation Project

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Documentation

Manual Pages and the man Command

You can obtain information about most commands and system files using the **man** command. A typical Linux installation includes many online pages that contain extensive information about Linux commands. This online help system contains the following information about each command:

- name
- synopsis
- description
- options
- files
- see also
- bugs
- author

Each command option (switch) is listed with a detailed explanation.

Related commands and files are listed at the end of the **man** page. The number traditionally seen in text books in parentheses after a command, for example **fstab(5)**, is the section of the manual pages where the command is discussed.

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Table 7.1 • man sections and their descriptions.

Section	Description
1	Executable programs or shell commands.
2	System calls (functions provided by the kernel).
3	Library calls (functions within program libraries).
4	Special files (usually found in **/dev**).
5	File formats and conventions (e.g. **/etc/passwd**).
6	Games.
7	Miscellaneous (including macro packages and conventions).
8	System administration commands (usually only for root).
9	Kernel routines (Non standard).
n	"New" or commands that didn't fit elsewhere.

To view a particular section of the man pages, include the section number with the **man** command and the term you are looking for:

```
man <section number> <term>
```

man fsck shows the command syntax, followed by a complete explanation of the **fsck** command.

To quit out of a man page when you are finished reading it, use the **q** key.

There are a number of command line options you can use with **man**: the following are just a few.

Some topics are included in more than one section of the **man** pages. For example, **crontab** is discussed in both Section 1 and in Section 5. This is because **crontab** is both a Linux command (and is included in Section 1 for that reason), and the name of a file (and is discussed in Section 5). If you want to learn about the command, type **man 1 crontab**. If you want to read about its configuration file, type **man 5 crontab**. Here the number in the command line refers to the relevant section of the **man** pages. Alternatively, you can also use **man -a crontab** to view all of **crontab**'s man pages.

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NOTE

There are some commands that do not have manual pages. Shell built-in commands do not have their own **man** pages, but are documented in the **man** page for the shell in question. If the information you are looking for is not in a **man** page, check the directories found under **/usr/share/doc**.

The **man** command does accept some command line options. Below are some of them.

Listing 7.10 • Some command line options for man.

-a Show all man pages on a particular topic.

-k Search man pages for particular term or string; same as **apropos**.

-h Print the man page as html.

-f Display a short description from the manual page; same as **whatis**.

If you wanted to see all of the man pages for the **passwd** command, you would type:

```
$ man -a passwd
```

This would bring up the entries for **passwd**(1), **passwd**(5) in succession. When you finish reading the entry for **passwd**(1), type **q** to go to the **passwd**(5) entry.

To search for a word or string in man pages, use the **-k** option. Here, we'll search for **pwconv**:

```
$  man -k pwconv
grpconv [pwconv]     (8)  - convert to and from shadow passwords and groups
grpunconv [pwconv]   (8)  - convert to and from shadow passwords and groups
pwconv               (8)  - convert to and from shadow passwords and groups
pwunconv [pwconv]    (8)  - convert to and from shadow passwords and groups
```

For a brief description from the man page of a file or command, use the **-f** option:

```
$ man -f slocate
slocate              (1)  - Security Enhanced version of the GNU Locate
$ man -f man
man                  (1)  - format and display the on-line manual pages
man                  (7)  - macros to format man pages
man.conf [man]       (5)  - configuration data for man
```

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Manual Entries

Manual pages are mostly stored under **/usr/share/man/**:

- **troff**/**nroff** format manual pages (compressed)
- Formatted manual pages (compressed) are usually temporarily stored under **/var/cache/man/**

Use the **echo** command to view the default search directories for man pages:

```
$ echo $MANPATH
/usr/man:/usr/share/man:/usr/X11R6/man:/usr/local/man
```

man can be set to search multiple directories by setting the **MANPATH** variable.

```
$ MANPATH=/usr/man:/usr/X11R6/man:/usr/share/man
$ export $MANPATH
$ man xterm
```

If the variable **MANPATH** is not set (and exported), then **man** will assume **/usr/man**. If **MANPATH** is set, then **man** will only look at directories explicitly set in the variable. If you wish to continue to use **/usr/man**, include it in **MANPATH**. Also do not forget to include **/usr/share/man** if defining **MANPATH** in case the man pages are located in that directory.

Manual pages are formatted when needed, and displayed using a pager program:

- **less** is generally used by default
- Set the **PAGER** variable to override the default

```
$ PAGER=less; export PAGER
$ man xterm
```

The variable **PAGER** is used to determine which screen page program to use to filter the output. The default may be either **less** or **more**, though **less** is probably now much more suitable, as you can page backwards, search for strings and patterns, and more.

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Related Commands

On most Linux systems that maintain the “index” or old-fashioned so-called **whatis** database, you can use the command **whatis** to print the short description of a command (“synopsis”):

```
$ whatis shadow
shadow (5)            - encrypted password file
```

The database for **whatis** is updated by the **/usr/bin/makewhatis** command.

When using the **whatis** command for the first time, run **makewhatis** to generate the **whatis** database.

Similar to the **whatis** command is the **-f** option for **man**:

```
$ man -f shadow
shadow (5)            - encrypted password file
```

Notice how the results for **whatis** and **man -f** for “shadow” are the same.

If you don’t know the actual name of a command, you can search for keywords in the synopsis with the commands **man -k** or its alias **apropos**:

```
$ apropos bash
bash (1)              - GNU Bourne-Again SHell
bashbuiltins (1)      - bash built-in commands, see bash(1)
rbash (1)             - restricted bash, see bash(1)
bashbug (1)           - report a bug in bash
```

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Exercise 7-1: Using man Pages.

Exercise Time: 10 Minutes

The usefulness of man pages should never be underestimated. Learn to use them! If the language and terminology of manual pages frightens you off, try **man** on a command you know well, like **cat** or **ls**.

When you read manual pages, notice the sections at the very end, such as Files, References. Sometimes these sections convey the very information you need to know — how this command or file interacts with others, which needs it, which is needed, etc.

1. Use the **man** command to display information about the **passwd** command. Note that this shows information about the command **passwd** and **passwd (5)** file. There is also a file called **/etc/passwd** and to view its contents, type:

   ```
   # less /etc/passwd
   ```

   Modify your **man** command so that a description of the **passwd** file rather than the **passwd** command is displayed.

2. Find out which pager program is being used by **man** and modify your environment to use the other one (i.e., if it is using **less** change to use **more** and vice-versa). You may need to read the manual pages for the **man** command itself.

   a. Find which commands from section 1 have anything to do with editing.

Use a combination of **apropos** command and **grep** (to pick up section 1 lines only).

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The info Command

The GNU help utility is **info**. Not all **man** pages are being maintained and are therefore out of date, so **info** sometimes yields more current information. Also, some topics treated in **info** are not discussed in **man** at all. **info** also uses hypertext links, so it is a more powerful utility.

Listing 7.11 • Command line options for the info command.

--apropos=SUBJECT	Look up SUBJECT in all indices of all manuals.
--directory=DIR	Add DIR to INFOPATH.
--dribble=FILENAME	Remember user keystrokes in FILENAME.
--file=FILENAME	Specify Info file to visit.
--index-search=STRING	Go to node pointed by index entry STRING.
--node=NODENAME	Specify Nodes in first visited Info file.
--output=FILENAME	Output selected nodes to FILENAME.
--restore=FILENAME	Read initial keystrokes from FILENAME.
--show-options, **--usage**	Go to command-line options node.
--subnodes	Recursively output menu items.
--vi-keys	Use vi-like and less-like key bindings.
--version	Display version information and exit.

To view the top-level **info** directory menu for emacs, type:

```
$ info emacs
```

To start at the buffers node within the emacs manual, type:

```
$ info emacs buffers
```

To start with emacs' command line options, type:

```
$ info --show-options emacs
```

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Both **man** and **info** allow access to a wealth of information. An administrator should make a habit of referring to these for information on a given command and to learn about new features in old commands.

Documentation in /usr/share/doc

Documentation that doesn't fall under man pages or info is usually put into **/usr/share/doc**. This directory can hold a wealth of information, including HOWTOs, user guides, FAQs, READMEs, and more. Generally, you can classify documents in **/usr/share/doc** into these categories:

- **HOWTOs**: HOWTOs are detailed guides on how to perform a particular function or task. A number of HOWTOs are located online at the Linux Documentation Project's web site.
- **Program-specific**: This is documentation that is included with a particular package or program, such as **portmap**. Documentation could include READMEs, FAQs, changes, TODOs, and other program specific references.
- **Frequently Asked Questions**: Also known as FAQs, these documents contain a list of questions about a topic. FAQs are usually in a question and answer format.

Usually these documents are in plain ASCII text, so you can read them with a variety of readers. Still, you can get many of these as HTML or postscript files.

On some older systems there may be a **/usr/doc** directory that contains similar documentation as **/usr/share/doc**.

Online Documentation

Vast amounts of information are available online. The trick is knowing where to look, otherwise you can spend hours pouring through documentation. Resources such as the Linux Documentation Project and newsgroups are great resource pools for online documentation. Also, for vendor specific products such as hardware or programs, the vendor's web site usually contains documentation. Vendor specific sites such as *apache.org* and *kde.org* are great resources for documentation and other help related to their respective products.

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The Linux Documentation Project

The Linux Documentation Project (**TLDP**) works on developing and maintaining good, reliable documentation for the Linux operating system. The overall goal of TLDP is to collaborate on all issues related to Linux documentation (man pages, HTML, to printed manuals, and so on) covering topics such as installing, using, and running Linux. For more information on TLDP, visit their web site:

http://www.tldp.org

The majority of Linux documentation comes in the form of documents called HOWTOs. Most HOWTOs contain excellent documentation including step-by-step instructions (if applicable) on the related topics. TLDP also maintains extensive guides, which are available in electronic and in printable format.

The following is a very brief list of some examples of HOWTOs, Mini-HOWTOs, and guides you can find on the TLDP web site:

- HOWTOs:
  - Alpha-HOWTO: A Brief Introduction to Alpha Systems and Processors
  - Apache-Compile-HOWTO: Apache Compile HOWTO
  - Bash-Prog-Intro-HOWTO: BASH Programming - Introduction HOWTO
  - Beowulf-HOWTO: Beowulf Supercomputer HOWTO
  - LVM-HOWTO: Logical Volume Manager HOWTO
  - Module-HOWTO: Linux Loadable Kernel Module HOWTO
- Mini-HOWTOs:
  - Automount
  - Modules
  - Mozilla Optimization
  - Multiboot-with-GrUB
  - NFS-Root
- Guides:
  - Advanced Bash-Scripting Guide
  - Windows+BSD+Linux Installation Guide

- The Linux System Administrators Guide
- Linux From Scratch

If this documentation is not already on your system under **/usr/share/doc/** or on the CDs of your distribution, you can download it from:

http://www.tldp.org/

Usenet Newsgroups

Usenet newsgroups serve as a world-wide forum for discussions on a particular topic, such as Linux networking. While some of these newsgroups are moderated to ensure that posts are not off-topic, many are not. Still, newsgroups are a good source of information. Some Linux newsgroups include:

- **comp.os.linux.advocacy**: The official Linux newsgroup.
- **comp.os.linux.advocacy**: General discussion about the benefits of Linux versus other operating systems.
- **comp.os.linux.alpha**: Discussion specific to Linux on Digital Alpha machines.
- **comp.os.linux.answers**: Moderated posting of Linux FAQs, HOWTOs, and READMEs.
- **comp.os.linux.apps**: General discussion about Linux software.
- **comp.os.linux.hardware**: General discussion about Linux hardware compatibility issues.
- **comp.os.linux.networking**: General discussion about networking and communication issues.

There are many more newsgroups in addition to the ones listed above. For more group listings, check out Google's group search:

http://groups-beta.google.com/groups?hl=en&tab=ng&q=linux&ie=UTF-8&lr=&sa=N

Newsgroup Archives

Since newsgroups can produce a large volume of traffic in one day, monitoring a newsgroup can be very time intensive. Instead of devoting most of your day to watching a newsgroup, you can go explore the newsgroup's archive. The archives contain previous posts and messages and are usually categorized by topic.

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Hardcopy Documentation

Paper and on-line system manuals are indispensable tools of the trade for the system administrator. Make sure you have a complete set ready on hand at all times. If the users frequently borrow manuals, it is worthwhile getting a duplicate set for the administrator or make a stipulation that all such literature does not leave the office. There are usually three types of hard-copy manuals:

- Reference books
- Guide books
- Tutorials

Look for a “Guide to Systems Administration” or a similarly titled manual. This describes how to perform the administration of your system and often give discussions, practical hints, etc.

Summary

- man pages are the primary source of documentation for most Linux users
- man pages are broken down into 10 sections:

Section	Description
1	Executable programs or shell commands.
2	System calls (functions provided by the kernel).
3	Library calls (functions within program libraries).
4	Special files (usually found in **/dev**).
5	File formats and conventions (e.g. **/etc/passwd**).
6	Games.
7	Miscellaneous (including macro packages and conventions).
8	System administration commands (usually only for root).
9	Kernel routines (Non standard).
n	"New" or commands that didn't fit elsewhere.

- man pages consist of the following sections:
  - name
  - synopsis
  - description
  - options
  - files
  - see also
  - bugs
  - author
- Some common command line options for **man** include:
  - **-a**: show all man pages on a particular topic
  - **-k**: search man pages for particular term or string; same as **apropos**

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  - **-h**: print the man page as html
  - **-f**: display a short description from the manual page; same as **whatis**
- Use the **whatis** command to view a short description of a command or file; analogous to **man -f**
- **apropos** searches synopses for keywords; analogous to **man -k**
- System information can be found in **/usr/share/doc**, including HOWTOs, program-specific documentation, and FAQs
- The Linux Documentation Project (*http:www.tldp.org*) contains a wealth of documents, HOWTOs, manuals, and much more