In this chapter:
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A

Bibliography

While the manual pages provide the definitive reference for individual pieces of the FreeBSD operating system, they are notorious for not illustrating how to put the pieces together to make the whole operating system run smoothly.

Since the last edition of this book, a number of other books on FreeBSD have appeared. We'll look at them first, though you can consider most of them to be an alternative to this book.

Books on BSD

The following books relate specifically to BSD, most of them to FreeBSD.

FreeBSD: An Open-Source Operating System For Your Personal Computer. Annelise Anderson, The Bit Tree Press, 2001. An introductory book, particularly suitable for Microsoft users.

Advanced UNIX Programming, by Warren W. Gay. Sams Publishing, 2000. This book uses FreeBSD as the basis for an in-depth programming course.

The Berkeley UNIX Environment, by R. Nigel Horspool. Prentice-Hall Canada Inc, 1992. This book predates FreeBSD, but it includes a lot of information for the advanced user.

Absolute BSD, by Michael Lucas. No Starch Press, 2002.

The FreeBSD Corporate Networker's Guide, by Ted Mittelstaedt. Addison-Wesley, 2001. An introduction to FreeBSD for Microsoft system administrators.

FreeBSD: The Complete Reference, by Roderick W. Smith. McGraw-Hill/Osborne, 2003.

The FreeBSD Handbook, edited by Murray Stokely and Nik Clayton. Wind River systems, 2001. A print version of the online handbook.

FreeBSD Unleashed, by Michael Urban and Brian Tiemann. Sams Publishing, 2002. An introduction to FreeBSD with detailed descriptions of shell programming, Gnome and Perl programming.

Users' guides

These books are good general texts. They have no particular emphasis on BSD.

UNIX for the Impatient, by Paul W. Abrahams and Bruce R. Larson. Second Edition, Addison-Wesley, 1996. An excellent not-too-technical introduction to UNIX in general. Includes a section on X11.

Learning the Unix Operating System: A Concise Guide for the New User, by Jerry Peek, Grace Todino-Gonguet, John Strang. 5th Edition, O'Reilly & Associates, Inc., 2001. A good introduction for beginners.

UNIX Power Tools, by Shelley Powers, Jerry Peek, Tim O'Reilly, Mike Loukides, O'Reilly & Associates, Inc., 3rd Edition October 2002. A superb collection of interesting information. Recommended for everybody, from beginners to experts.

Administrators' guides

Building Internet Firewalls, by D. Brent Chapman and Elizabeth Zwicky. O'Reilly & Associates, Inc., 1995.

DNS and BIND, by Paul Albitz, Cricket Liu. 4th Edition, O'Reilly & Associates, Inc., 2001

Firewalls and Internet Security: Repelling the Wily Hacker, by William R. Cheswick and Steven M. Bellovin. Second edition, Addison-Wesley, 2003.

Essential System Administration, by Æleen Frisch. Third edition, O'Reilly & Associates, Inc., 2003. Includes coverage of FreeBSD 4.7.

TCP/IP Network Administration, by Craig Hunt. Third Edition. O'Reilly & Associates, 2002

UNIX System Administration Handbook, by Evi Nemeth, Garth Snyder, Scott Seebass, and Trent R. Hein. 3nd edition, Prentice Hall, 2001. An excellent coverage of four real-life systems, including FreeBSD 3.4.

Managing NFS and NIS, by Hal Stern, Mike Eisler and Ricardo Labiaga. 2nd Edition, O'Reilly & Associates, Inc., 2001

Using Samba, by Jay Ts, Robert Eckstein and David Collier-Brown. 2nd Edition, O'Reilly & Associates, Inc., 2003.

New ATA (IDE) disk driver

There is a new driver, *ata*, for *ATA* (*AT attachment*) drives, which were formerly called IDE. It supports not only disks but also ATAPI CD-ROM and DVD drives, ZIP drives and tape streamers.

In the process, the name of the devices has changed: disk drives are now called *ad*, CD-ROM drives are called *acd*, LS-120 floppies are called *afd*, and tapes are called *ast*.

For a transition period, the *wd* driver remains available, but you shouldn't use it unless you have very good reasons, for example if you have old or unusual hardware that has trouble with the *ad* driver.

New console driver

FreeBSD Release 4 includes a new console driver. The configuration file entries have changed. See the `GENERIC` configuration file for more details.

FreeBSD Release 5

FreeBSD Release 5 is the latest release of FreeBSD. It has a number of new features, most of which are transparent to the user. There's a complete list in the release notes, which you should certainly read if you're upgrading the system, but here are some highlights:

- SMP (symmetric multiprocessor) support has been rewritten from scratch. This will ultimately give much better performance and scalability, though currently the performance potential has not been fully realized. We looked at some of the visible differences on page 148.
- The *kqueue* event notification facility is a new interface that is able to replace *poll* and *select*. It offers improved performance as well as the ability to report many different types of events. Support for monitoring changes in sockets, pipes, fifos, and files are present, as well as for signals and processes.
- A large number of kernel configuration options have been turned into boot-time tunable variables, and the need to build specific kernels has become much more seldom.
- The *Kernel-Scheduled Entity* (*KSE*) project offers multi-threading in the kernel.
- Support for the 80386 processor has been removed from the `GENERIC` kernel, as this code seriously pessimizes performance on other IA32 processors.

  The `I386_CPU` kernel option to support the 80386 processor is now mutually exclusive with support for other IA32 processors; this should slightly improve performance on the 80386 due to the elimination of run time processor type checks.

Custom kernels that will run on the 80386 can still be built by changing the cpu options in the kernel configuration file to only include `I386_CPU`.

- Support has been added for 64 bit SPARC and IA 64 (Itanium) processors.
- The system includes the *device file system*, or *devfs*. In older releases of FreeBSD, as in other versions of UNIX, the directory */dev* contained *device nodes*, entries that looked like files but which in fact described a possible device on the system. The problem was that there was no good way to keep the device nodes in sync with the kernel, and problems occurred where the hardware corresponding to a device node didn't exist (a ''Device not configured'' error), or where the device node corresponding to the hardware did not exist (a ''no such file or directory'' error). *devfs* solves this problem by creating at boot time the device nodes for the hardware the system finds.
- The disk I/O access system has been rearranged and made more flexible with the *GEOM* framework.
- A number of file system enhancements have been made. The standard UFS file system now supports snapshots and background file system checking after a crash, significantly reducing reboot time after a crash.
- UFS has been significantly enhanced as *UFS2*. It supports files larger than 1 TB and extended file attributes.
- The PCMCIA code has been rewritten and now supports CardBus devices.
- The default kernel no longer supports *a.out* file format. You can still execute these files by loading the *aout.ko* KLD.
- FreeBSD now supports the *Advanced Configuration and Power Interface* (*ACPI*), the replacement for *APM*.
- It is now possible to increase the size of ufs file systems with the *growfs* command.
- *Vinum* now supports the root file system. See Chapter 12 for details.
- *disklabel*, the program which creates disk labels, has been split into multiple programs depending on the platform: on PCs it is now called *bsdlabel*, and on SPARC64 it is called *sunlabel*. Some options have changed. In particular, the `-r` option no longer exists. See page 215 for further details.