CHAPTER 20

The Linux System

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This chapter presents an in-depth examination of the Linux operating system. By examining a complete, real system, we can see how the concepts we have discussed relate both to one another and to practice.

Linux is a variant of UNIX that has gained popularity over the last several decades, powering devices as small as mobile phones and as large as room-filling supercomputers. In this chapter, we look at the history and development of Linux and cover the user and programmer interfaces that Linux presents—interfaces that owe a great deal to the UNIX tradition. We also discuss the design and implementation of these interfaces. Linux is a rapidly evolving operating system. This chapter describes developments through the Linux 4.12 kernel, which was released in 2017.

Bibliographical Notes

The Linux system is a product of the Internet; as a result, much of the available documentation on Linux is available in some form on the Internet. The following key sites reference most of the useful information available:

- The *Linux Cross-Reference Page (LXR)* (http://lxr.linux.no) maintains current listings of the Linux kernel, browsable via the web and fully cross-referenced.
- The *Kernel Hackers' Guide* provides a helpful overview of the Linux kernel components and internals and is located at http://tldp.org/LDP/tlk/tlk.html.
- The *Linux Weekly News (LWN)* (http://lwn.net) provides weekly Linux-related news, including a very well researched subsection on Linux kernel news.

Many mailing lists devoted to Linux are also available. The most important are maintained by a mailing-list manager that can be reached at the e-mail address majordomo@vger.rutgers.edu. Send e-mail to this address with the

single line "help" in the mail's body for information on how to access the list server and to subscribe to any lists.

Finally, the Linux system itself can be obtained over the Internet. Complete Linux distributions are available from the home sites of the companies concerned, and the Linux community also maintains archives of current system components at several places on the Internet. The most important is ftp://ftp.kernel.org/pub/linux.

In addition to investigating Internet resources, you can read about the internals of the Linux kernel in [Mauerer (2008)] and [Love (2010)].

Bibliography

[Love (2010)] R. Love, *Linux Kernel Development*, Third Edition, Developer's Library (2010).

[Mauerer (2008)] W. Mauerer, *Professional Linux Kernel Architecture*, John Wiley and Sons (2008).