



Glossary of Linux Terms

This appendix provides brief explanations of common terms used in the Linux and Unix environments. These include technical terms, as well as conventions used within the Linux community. Due to space limitations, this glossary is somewhat selective, but still should prove a lasting reference as well as a helpful guide for those new to Linux.

Cross-referenced terms are highlighted in italics.

Symbols

.

Symbol that, in the context of file management, refers to the current directory.

..

Symbol that, in the context of file management, refers to the parent directory of that currently being browsed.

/

Symbol that, in the context of file management, refers to the *root* of the file system; also separates directories in a path listing.

~

Symbol that, in the context of file management, refers to a user's home directory.

|

Pipe symbol; used at the *command prompt* to *pipe* output from one *command* to another.

>

Symbol that, when used at the *command prompt*, indicates output should *redirect* into a file.

<

Symbol that, when used at the *command prompt*, indicates a *command* should accept input from a file (see *redirect*).

#

Symbol that, when it appears on the *command prompt*, usually indicates the user is currently logged in as *root*.

\$

Symbol that, when it appears on the *command prompt*, usually indicates the user is currently logged in as an ordinary user. (Note that some versions of *Linux/Unix* use % or > instead of \$.)

?

Wildcard character indicating that any character can be substituted in its place.

*

Wildcard character indicating that zero or more characters can appear in its place.

***nix**

Popular but unofficial way of describing the family tree that comprises *Unix* and its various clones, such as *Linux* and *Minix*.

A

administrator

Another word for either the *root* user or one who has adopted that user's powers temporarily.

AIX

IBM's *proprietary* form of *Unix* that runs on the company's proprietary hardware, as well as *commodity* hardware based around AMD and Intel processors. Nowadays, IBM is slowly deprecating AIX in favor of *Linux*.

alias

Method of creating a user-defined *command* that, when typed, causes another command to be run or a *string* to be expanded.

Apache

Popular *Open Source* web server software that runs on *Unix*, *Linux*, and other operating system platforms. Considered responsible in part for the rise in popularity of Linux in the late 1990s.

applet

Small program that, in the context of the *Ubuntu* desktop, runs as part of a larger program and offers functions that complement the main program. The *GNOME* desktop incorporates several applets in its notification area.

APT

Advanced Packaging Tool; the underlying system by which software is managed and installed on *Ubuntu* and *Debian Linux* systems. *Shell* commands beginning with `apt`, such as `apt-get`, are used to install new software from various repositories. Under *Ubuntu*, the Synaptic Package Manager program provides a *GUI* method of using APT.

archive

Any file containing a collection of smaller files, compressed or otherwise (see also *tar*).

B**BASH**

Bourne Again SHell. The most common *shell* interpreter used under *Linux* and offered as default on many Linux systems.

binary executable

Another way of referring to a program that has been compiled so that it can be used day-to-day. See also *compile*.

block device

How the *Linux kernel* communicates with a *device* that sends and receives blocks of data; usually a hard disk or removable storage device. See also *character device*.

BSD Unix

Berkeley Software Distribution Unix; form of *Unix* partially based on the original *Unix source code* but also incorporating recent developments. BSD is *open source* and free for all to use and share with practically no restrictions. There are various forms of BSD Unix, such as FreeBSD, NetBSD, and OpenBSD. BSD doesn't use the *Linux kernel*, but it runs many of the same programs. Some of the programs offered within the Linux operating system come from BSD.

bzip2

Form of file compression. Together with the older and less efficient *gzip*, it is a popular form of file compression under *Linux* and the equivalent to Zip compression under Windows. Files employing bzip compression are usually given a `.bz2` file extension. See also *tar*.

C

C

Programming language in which much of the *Linux kernel* is written, as were later versions of *Unix* before it. *C* was created by some of the same people who created *Unix*, and its development mirrors that of *Unix*.

C++

Object-oriented programming language; originally designed to be an enhancement to *C*, but now seen as a popular alternative.

C#

Modern programming language, which uses similar syntax to *C*, created by Microsoft and re-created on *Linux* via the Mono project.

character device

How *Linux* refers to a *device* that sends/receives data asynchronously. For various technical reasons, this typically refers to the *terminal* display. See also *block device*.

checksum

Mathematical process that can be applied to a file or other data to create a unique number relative to the contents of that file. If the file is modified, the checksum will change, usually indicating that the file in question has failed to download correctly or has been modified in some way. The most common type of checksum program used under *Linux* is *md5sum*.

client

Shorthand referring to a computer that connects to a *server*.

closed source

The reverse of *Open Source* in which the *source code* is not available for others to see, share, or modify. See also *proprietary*.

code

See *source code*.

command

Input typed at the *shell* that performs a specific task, usually related to administration of the system and/or the manipulation of files.

command-line prompt

See *shell*.

commodity

In the context of hardware, describes PC hardware usually based around Intel or AMD processors that can be bought off the shelf and used to create sophisticated computer systems (as opposed to buying specially designed hardware). One reason for *Linux*'s success is its ability to use commodity hardware.

community

The general term for the millions of *Linux* users worldwide, regardless of what they use Linux for or their individual backgrounds. By using Linux, you automatically become part of the community.

compile

The practice of creating a binary file from *source code*, usually achieved using the `./configure, make, make install` series of commands and scripts.

config file

Configuration file; any file that contains the list of settings for a program. Sometimes it's necessary to edit config files by hand using programs like *vi* or *Emacs*, but often the program itself will write its config file according to the settings you choose.

copyleft

The legal principle of protecting the right to share a creative work, such as a computer program, using a legally binding license. Copyleft also ensures future iterations of the work are covered in the same way.

cracker

Someone who breaks into computer systems to steal data or cause damage. The term is not necessarily linked to *Linux* or *Unix* but was created by the *community* to combat the widespread use of hacker in this sense. The word *hacker* has traditionally defined someone who merely administers, programs, and generally enjoys computers.

cron

Background *service* that schedules tasks to occur at certain times. It relies on the crontab file.

CUPS

Common Unix Printing System; set of programs that work in the background to handle printing under *Unix* and *Linux*.

curses

Library that lets software present a semigraphical interface at the *shell*, complete with menu systems and simple mouse control (if configured). The version of curses used under *Linux* and *Unix* is called ncurses.

CVS

Concurrent Versioning System; application that allows the latest version of software packages to be distributed over the Internet to developers and other interested parties.

D**daemon**

See *service*.

Debian

Voluntary organization that produces *distributions* of *Free Software* operating systems, including *Linux*. Because it is a nonprofit organization run by passionate Free Software advocates, it is considered the most ethically sound of all Linux outfits. Many *distributions*, including *Ubuntu*, use Debian as the basis for their software because of its claimed reliability and relative simplicity.

dependency

A way of referring to system files that a program requires in order to run. If the dependencies are not present during program installation, a program might refuse to install.

device

Linux shorthand describing something on your system that provides a function for the user or that the system requires in order to run. This usually refers to hardware, but it can also describe a virtual device that is created to provide access to a particular Linux function.

directory

What Windows refers to as a folder; areas on a hard disk in which files can be stored and organized.

distribution

A collection of software making up the *Linux* operating system; also known as a *distro*. The software is usually compiled by either a company or organization. A distribution is designed to be easy to install, administer, and use by virtue of it being an integrated whole. Examples include *Ubuntu*, *SUSE Linux*, *Red Hat*, and *Debian*.

distro

Shorthand for *distribution*.

documentation

Another way of describing written guides or instructions; can refer to online sources of help as well as actual printed documentation.

dpkg

Shell command that can be used to administer software under *Ubuntu* and *Debian*. However, the *APT* system, which uses *dpkg*, is the preferred method of installing software.

E**Emacs**

Seminal text editor and pseudo-*shell* beloved by *Unix* aficionados; can be used for programming tasks, simple word processing, and much more. This editor has cultural significance as one of the core pieces of software offered by *GNU Project, The*. Emacs was originally developed principally by *Stallman, Richard*. See also *vi*.

environment

Shorthand referring to a user's unique *Linux* configuration, such as variables that tell the *shell* where programs are located.

F**FAT32**

File Allocation Table 32-bits; file system offered by Windows 98, Me, 2000, and XP. *Linux* can both read and write to FAT32 file systems. See also *NTFS* and *VFAT*.

Firefox

Web browser program used under *Ubuntu* and produced by the *Mozilla Foundation*.

FLOSS

Free, Libre, or Open Source Software; used within the *community* to describe all software or technology that, broadly speaking, adheres to the ethical approach of *Open Source* software and/or *Free Software*, as well as its legal guidelines.

FOSS

Free or Open Source Software; alternative term for *FLOSS*.

free

When used to describe software or associated areas of technology, “free” indicates that the project abides by the ethical (if not legal) guidelines laid down by *GNU Project, The*. It doesn't indicate that the software is free in a monetary sense; its meaning is quite different from “freeware.”

Free Software

Software in which the *source code*—the original listing created by the programmer—is available for all to see, share, study, and adapt to their own needs. This differs from the concept of *open source* because the right of others to further modify the code is guaranteed via the *GNU Public License* (GPL) software license (or a compatible license). For various reasons, Free Software sometimes does not include the source code (although the software can still be legally decompiled), but this is rare.

G

gcc

GNU Compiler Collection; programs used when creating *binary executable* files from *source code*.

GID

Group ID; numbering system used by the operating system to refer to a *group*.

GIMP

GNU Image Manipulation Program; high-powered image-editing program that runs under *Linux*, *Unix*, Windows and other operating systems. Often preceded by the definite article: “The GIMP.”

GNOME

GNU Network Object Model Environment; a *GUI*-based desktop environment used by *Ubuntu*, as well as several other *distributions*. It uses the *GTK+* *libraries*. See also *KDE*.

GNU

GNU’s Not Unix; see *GNU Project, The*.

GNU/Linux

Another name for the operating system referred to as *Linux*. The name GNU/Linux gives credit to the vast quantity of *GNU Project, The* software that is added to the *Linux kernel* within a *distro* to make a complete operating system. As such, GNU/Linux is the preferred term of many *Free Software* advocates.

GNU Project, The

Organization created by *Stallman, Richard* in order to further the aims of *Free Software* and create the body of software that makes up the *GNU* operating system.

GNU Public License

Software license principally created by *Stallman, Richard* in order to protect software *source code* against *proprietary* interests and ensure that it will always be shared. It does this by insisting that any source code covered by the GNU Public License (GPL) must remain licensed under the GPL, even after it has been modified or added to by others. The *Linux kernel*, as well as much of the software that runs on it, uses the GPL.

GPL

See *GNU Public License*.

grep

Global Regular Expression Print; powerful *shell command* that lets you search a file or other form of input using *regular expressions*. Because of the ubiquity of the *grep* program, many *Linux* and *Unix* users refer to searching as “grepping.” To “*grep* a file” is to search through it for a *string*.

group

Collection of users under one heading (group name) to facilitate system administration.

GRUB

GRand Unified Bootloader; boot manager program that offers a menu from which you can choose which operating system you wish to boot. It’s needed to load the *kernel* program and thereby initiate the *Linux* boot procedure.

GUI

Graphical user interface; describes the software that provides a graphical system to display data and let you control your PC (usually via a mouse).

guru

One who is experienced and knowledgeable about *Linux/Unix* and is willing to share his or her knowledge with others. In a perfect world, every *newbie* would have his or her own guru.

gzip

One of the two preferred forms of file compression used under *Linux*. Files employing *gzip* compression usually have a *.gz* file extension. See also *bzip2*.

H

hack

Ingenious and/or extremely efficient solution to a problem, particularly within the programming world.

hacker

Term used within the *community* to describe anyone who enjoys computers and possesses some skill therein, either in a professional capacity or as a hobby. This term is distinct from connotations of maliciously breaking into computers propagated by the media. See also *cracker*.

host

Shorthand referring to any computer that acts as a *server* to another computer. See also *client*.

HP-UX

Hewlett-Packard's *proprietary* form of *Unix* designed to work on its own hardware platform.

Hurd

Kernel being developed by *GNU Project, The*. It's not associated with the *Linux* kernel in any way.

I**info**

Source of *documentation* accessible from the *shell*; an alternative to the more established *man page* system. Also known as *Texinfo*.

init

The program that is automatically run after the *kernel* has finished loading, and therefore early in the boot procedure. It's responsible for effectively starting the operating system.

init.d

Collection of startup *scripts* that make up the components of a *run level*. Under *Ubuntu*, these are found at `/etc/init.d/`. *Symbolic links* to selected *init.d* scripts are contained in folders within `/etc/init.d` that are named after *run level* numbers, such as `rc0.d`, `rc1.d`, `rc2.d`, and so on.

initrd

Initial RAM disk; system used by the *Linux kernel* to load *modules* that are essential for the kernel to be able to boot, such as disk controllers.

inode

Part of the usually invisible file system structure that describes a file, such as its ownership permissions or file size.

ipchains

Now deprecated component of version 2.2 of the *Linux kernel* that allows the creation of network security setups, such as firewalls or port-forwarding arrangements. Note that some *distros* still prefer to use *ipchains*. See also *iptables*.

iptables

Component of versions 2.4 and 2.6 of the *Linux kernel* that allows powerful network security setups. Chiefly used in the creation of firewalls, but can be used for more elementary arrangements such as network address translation (NAT) routers.

J**job**

How the *BASH shell* refers to a running program in order to facilitate administration by the user.

journaling

File system technology in which integrity is maintained via the logging of disk writes.

K**KDE**

K desktop environment; *GUI* and set of additional programs used on various *distros*, such as *Mandriva* and a variation of *Ubuntu* called *Kubuntu*.

kernel

Essential but ordinarily invisible set of programs that run the computer's hardware and provide a platform on which to run software. In the *Linux* operating system, the kernel is also called *Linux*, after its creator, *Torvalds, Linus*.

kernel panic

Error message that appears when the *kernel* program in *Linux* cannot continue to work. In other words, a polite way of indicating a crash or, more often, a problem arising from user misconfiguration. This is most often seen when booting up after making incorrect changes to the system.

kludge

Community slang describing an inelegant way of making something work, usually not in a way that is generally accepted as being correct. Pronounced "klodge."

Kubuntu

Version of *Ubuntu* that substitutes the *GNOME* desktop environment for *KDE*. At the time of writing, it is less mature than the standard version of *Ubuntu*.

L**LAMP**

Acronym describing a series of programs that work together to provide a complete *Linux*-based web-hosting environment. Stands for *Linux*, *Apache*, *MySQL*, and Perl, PHP or Python (the last three in the list are scripting languages; see *script*).

LGPL

Lesser GPL; version of the *GNU Public License* (GPL) in which some use restrictions are slackened at the expense of various freedoms laid down by the main GPL. The LGPL is mostly used for *library* files.

library

General term referring to code that programs need to run and that, once in memory, is frequently accessed by many programs (leading to the phrase “shared library”). The most common and vital library is *glibc* (GNU C Library), created by *GNU Project*, *The* and the fundamental building block without which *Linux* could not operate. *GNOME* relies on the *GTK+* libraries, among others.

link

File system method of assigning additional filenames to a file; also known as a “hard link.” See also *symbolic link*.

Linux

You mean you don’t know by now? *Linux* is what this book is all about. It is a *kernel* program created by *Torvalds*, *Linus* in 1991 to provide an inexpensive operating system for his computer, along with other components. These days, *Linux* is used to describe the entire operating system discussed in this book, although many argue (perhaps quite rightly) that this is inaccurate, and use the term *GNU/Linux* instead.

local

Shorthand referring to the user’s PC or a device directly attached to it (as opposed to *remote*).

localhost

(1) Network name used internally by *Linux* and software to refer to the *local* computer, distinct from the network.

(2) Default name given to a Linux-based PC when no other name is defined during installation. However, under Ubuntu, the name `ubuntu` is assigned if no name is defined by the user.

M

man page

Documentation accessible from the *shell* that describes a *command* and how it should be used.

Minix

Operating system that is a rough clone of *Unix*, created by Professor Andrew Tanenbaum. It was the inspiration for *Linux*.

module

Program code that can be inserted or removed from the *kernel* in order to support particular pieces of hardware or provide certain kernel functions. Drivers under Windows perform the same function.

mount

To add a file system so that it is integrated (and therefore accessible) within the main file system; applies to external file systems, such as those available across networks, as well as those on the *local* PC, such as the hard disk or CD/DVD-ROMs.

Mozilla Foundation

Organization founded by Netscape to create *open source* Internet software, such as web browsers and e-mail clients; originally based on the Netscape *source code*. At the time of writing, it produces the *Firefox* and *Camino* web browsers, the *Thunderbird* e-mail and *Usenet* client, the *Bugzilla* bug-tracking software, as well as other programs.

MySQL

Popular and powerful *open source* database application. See also *LAMP*.

N

newbie

Term used to describe anyone who is new to *Linux* and therefore still learning the basics. It's not a derogatory term! See also *guru*.

NFS

Network File System; reliable and established method of sharing files, printers, and other resources across a network of *Unix*-based operating systems. See also *Samba*.

NTFS

NT File System; file system offered by Windows NT, 2000, and XP. It can be read by *Linux*, but usually writing is prohibited because it is considered unsafe. See also *FAT32*.

O**OpenOffice.org**

Open Source office suite project created with the continuing input of Sun Microsystems and based on code Sun contributed to the Open Source *community*. Its commercial release is in the form of Star Office (although Star Office has several *proprietary* components added).

open source

(1) Method and philosophy of developing software whereby the *source code*—the original listing created by the programmer—is available for all to see. Note that open source is not the same as *Free Software*; describing software as open source doesn't imply that the code can be shared or used by others (although this is often the case).

(2) A community of users or any project that adheres to open-source values and/or practices.

P**partition**

Subdivision of a hard disk into which a file system can be installed.

PID

Process ID; the numbering system used to refer to a *process*.

pipe

Method of passing the output from one *command* to another for further processing. Piping is achieved within the *shell* by typing the | symbol.

POSIX

Portable Operating System Interface; various technical standards that define how *Unix*-like operating systems should operate and to which the *Linux* operating system attempts to adhere.

PPP

Point-to-Point Protocol; networking technology that allows data transfer across serial connections like telephone lines. In other words, it's the technology that lets you connect to your Internet service provider using a modem.

process

The way the system refers to the individual programs (or components of programs) running in memory.

proprietary

Effectively, software for which a software license must be acquired, usually for a fee. This usually means the *source code* is kept secret, but it can also indicate that the source code is available to view but not to incorporate into your own projects or share with others.

R**Red Hat**

Well-known company that produces distributions of *Linux*.

redirect

To send the output of a *command* into a particular file. This also works the other way around: the contents of a particular file can be directed into a command. Redirection is achieved within the *shell* using the left and right angle brackets (< and >), respectively.

regex

See *regular expression*.

regular expression

Powerful and complex method of describing a search *string*, usually when searching with tools such as *grep* (although regular expressions are also used when programming). Regular expressions use various symbols as substitutes for characters or to indicate patterns.

remote

Indicates a computer or *service* that is available across a network, including but not limited to computers on the Internet (as opposed to *local*).

root

- (1) The bottom of the *Linux* file system directory structure, usually indicated by a forward slash (/).
- (2) The user on some versions of *Unix* or *Linux* who has control over all aspects of hardware, software, and the file system.
- (3) Used to describe a user who temporarily takes on the powers of the root user (via the `sudo` command, for example).

RPM

Red Hat Package Manager; system used to install and administer programs under *Red Hat*, *SUSE Linux* and some other *distributions*. See also *APT*.

RTFM

Read the freaking manual/*man page*; exclamation frequently used online when a *newbie* asks for help without having undertaken basic research.

run level

Describes the current operational mode of *Linux* (typically, the *services* that are running). Run level 1 is single-user mode (a stripped-down system with minimal running services); run levels 2 through 5 provide a *GUI*; run level 6 is reboot mode (switching to it will cause the computer to terminate its processes and then reboot); run level 0 is shutdown (switching to it will cause the PC to shutdown).

S**Samba**

Program that re-creates under *Unix* or *Linux* the Microsoft *SMB*-based system of sharing files, printers, and other computer resources across a network. It allows Linux to become a file or printer server for Linux and Windows computers, and also allows a Linux client to access a Windows-based server.

scalable

Term describing the ability of a single computer program to meet diverse needs, regardless of the scale of the potential uses. The *Linux kernel* is described as being scalable because it can run supercomputers, as well as handheld computers and home entertainment devices.

script

Form of computer program consisting of a series of *commands* in a text file. Most *shells* allow some form of scripting, and entire programming languages such as Perl are based around scripts. In the context of the Linux operating system, shell scripts are usually created to perform trivial tasks or ones that frequently interact with the user. Shell scripts have the advantage that they can be frequently and easily modified. The *Linux* boot process relies on several complex scripts to configure essential system functions such as networking and the *GUI*. See also *init*.

server

- (1) Type of computer designed to share data with other computers over a network.
- (2) Software that runs on a computer and is designed to share data with other programs on the same PC or with other PCs across a network.

service

Background program that provides vital functions for the day-to-day running of *Linux*; also known as a *daemon*. Services are usually started when the computer boots up and as such are constituent parts of a *run level*.

shell

Broadly speaking, any program that creates an operating environment in which you can control your computer. The *GNOME* desktop can be seen as a shell, for example. However, it's more commonly understood within *Unix* and *Linux* circles as a program that lets you control the system using *commands* entered at the keyboard. In this context, the most common type of shell in use on Linux is *BASH*.

Shuttleworth, Mark

Entrepreneurial South African businessman who, as a long-term *Debian hacker*, devised and financially supports *Ubuntu* via his company, Canonical Ltd.

SMB

Server Message Block; network technology for sharing files, printers, and other resources. See also *Samba*.

Solaris

Form of *Unix* sold by Sun Microsystems; runs on *proprietary* hardware systems as well as on *commodity* systems based on Intel and AMD processors.

source code

The original program listing created by a programmer. Most programs that you download are precompiled—already turned into *binary executables* ready for general use—unless you specifically choose to download and *compile* the source code of a program yourself.

SSH

Secure SHell; program that lets you access a *Linux/Unix* computer across the Internet. SSH encrypts data sent and received across the *link*.

SSL

Secure Sockets Layer; form of network data transfer designed to encrypt information for security purposes. It's used online for certain web sites and also within *Linux* for certain types of secure data exchange.

Stallman, Richard M.

Legendary *hacker* who founded *GNU Project, The* and created the concept of *copyleft*, as well as the software license that incorporates it: the *GNU Public License* (GPL). See also *Torvalds, Linus*.

standard error

Linux and *Unix* shorthand for the error output provided by a *command*.

standard input

Linux and *Unix* shorthand for the *device* usually used to provide input to the *shell*. For the majority of desktop PC users, this refers to the keyboard.

standard output

Linux and *Unix* shorthand for the *device* usually used to display output from a *command*. For the majority of desktop PC users, this refers to the screen.

string

A word, phrase, or sentence consisting of letters, numbers, or other characters that is used within a program and is often supplied by the user.

sudo

Program that runs under *Unix* and *Linux* by which ordinary users are temporarily afforded *administrator* rights. Ubuntu relies on *sudo* as the exclusive way for users to administer the system.

SVG

Scalable Vector Graphics; vector graphics technology. SVG is actually an XML markup language designed to create 2D graphics, increasingly used for *Linux* desktop icons and web graphics.

swap

Area of the hard disk that the *Linux kernel* uses as a temporary memory storage area. Desktop or *server* Linux differs from Windows in that it usually requires a separate hard disk *partition* in which to store the swap file.

symbolic link

Type of file akin to a Windows shortcut. Accessing a symbolic link file routes the user to an actual file. See also *link*.

sysadmin

Systems administrator; a way of describing the person employed within a company to oversee the computer systems. In such an environment, the sysadmin usually is the *root* user of the various computers.

System V

Variant of *Unix* used as a foundation for modern forms of *proprietary* Unix.

T**tainted**

Describes a *kernel* that is using *proprietary modules* in addition to *Open Source* modules. Can also refer to insecure software.

tar

Tape Archive; software able to combine several files into one larger file in order to back them up to a tape drive or simply transfer them across the Internet. Such files are usually indicated by a *.tar* file extension. Note that a tar file isn't necessarily compressed; the *bzip2* and *gzip* utilities must be used if this is desired.

TCP/IP

Transmission Control Protocol/Internet Protocol; standard protocol stack used by most modern operating systems to control and communicate across networks and also across the Internet (as opposed to NetBEUI, commonly available on older versions of Windows, and IPX/SPX, used on Novell's NetWare operating system).

terminal

Another word for *shell*.

TeX

Method and set of programs for typesetting complex documents. Invented prior to word processors and desktop publishing software, and now considered a specialized tool for laying out scientific texts. An updated version of the program called LaTeX is also available.

Torvalds, Linus

Finnish programmer who, in 1991, created the initial versions of the *Linux kernel*. Since then, he has taken advantage of an international network of volunteers and staff employed by various companies who help produce the kernel. Torvalds himself contributes and oversees the efforts.

tty

TeleTYpewriter; shorthand referring to underlying *Linux* virtual *devices* that allow programs and users to access the *kernel* and thereby run programs.

Tux

The name of the penguin character that is the *Linux* mascot. The original Tux graphic was drawn by Larry Ewing.

U

Ubuntu

Linux distribution with several unique characteristics. Ubuntu is designed primarily for desktop use, although several server versions are available. It is intended for use by individuals in any location in the world, so it has strong multiple language support. It's run by the *Ubuntu Foundation*, which is financially backed by *Shuttleworth, Mark*. Each release is guaranteed to be supported for 18 months (5 years in the case of server releases).

Ubuntu Foundation

Organization set up by *Shuttleworth, Mark* and his company, Canonical, Ltd., to administer and provide support for the *Ubuntu* distribution of *Linux*.

UID

User ID; numbering system used by the operating system to refer to a *user*.

Unix

Seminal operating system created as a research project in 1969 by Kenneth Thompson and Dennis Ritchie at Bell Labs (later AT&T). Because it was initially possible to purchase the *source code* for a fee, subsequent revisions were enhanced by a variety of organizations and went on to run many mainframe and minicomputer systems throughout the 1980s, 1990s, and up to the present. Nowadays, Unix is fragmented and exists in a variety of different versions. Perhaps most popular is its *Open Source* rendition, *BSD Unix*, which has seen many developments since the source code was first released. This means that BSD Unix no longer exists but has instead diversified into a number of separate projects. *Proprietary* versions are also available, including *Solaris*, *HP-UX*, and *AIX*.

user

The way the operating system refers to anyone who accesses its resources. A user must first have a user account set up, effectively giving that user his or her own private space on the system. In addition to actual human users, an average *Linux* system has many other user accounts created to let programs and *services* go about their business. These are usually not seen by human users.

V**variable**

A changeable value that stores a certain data type (such as a number, date, or *string*), remembering it for future reference by the system or *script* it is defined by. Variables defined by and for the *Linux kernel* are vital to it.

verbose

Command option that will cause it to return more detailed output (or, in some cases, to return actual output if the command is otherwise “quiet”); usually specified by adding the `-v` command option.

VFAT

Virtual File Allocation Table; technical name of Microsoft’s FAT file system offered under Windows and also on removable storage devices such as flash memory cards.

vi

Arcane text editor and pseudo-shell beloved by *Unix* aficionados that can be used for creation of text files or for creating programs. Traditionally, Unix users either love or hate vi; some prefer *Emacs*.

W**Wine**

Short for Wine Is Not an Emulator; software that re-creates the Windows Application Programming Interface (API) layer within *Linux* and lets users run Windows programs.

workspace

X terminology referring to a *GUI* desktop.

X

X

Short for X Window; software that controls the display and input devices, thereby providing a software foundation on top of which desktop managers like *GNOME* are able to run.

X11

Version 11 of the *X* software, currently in use on most desktop *Linux* systems.

XFree86 Project

Organization that creates *X* software. At one time, every *distribution* of *Linux* used XFree86 software, but most now use similar software from the *X.org* organization.

xinetd

The *service* responsible for starting various network servers on the computer.

XMMS

Audio player program.

X.org

Organization that produces the X Window software and, in particular, a set of programs called X11. X11 is used on most modern distributions of *Linux*. It is backed by a number of *Unix* and Linux industry leaders.

xterm

Simple program that allows you to run a shell under X. This program has the advantage of being available on most *Linux* systems that offer a *GUI*.



BASH Command Index

This appendix provides a whistle-stop tour of commands that can be used at the BASH shell. This is a highly selective listing, intended to provide a guide to commands that see day-to-day use on average desktop systems. In a similar fashion, although some command options are listed, they're strictly limited to those that receive regular deployment.

The descriptions of each command are deliberately simple. Note that the quantity of space a command is given is not an indication of its importance or usefulness. To this end, commands in the list with an asterisk after their name offer far more than hinted at by its brief description hints. In such cases, I strongly advise that you refer to the command's man page for more information.

Various conventions are used in the list:

- You should substitute your own details wherever italicized words appear.
- Commands that can and might be run by ordinary users are preceded with a dollar sign (\$).
- Commands that require root privileges (the use of `sudo`) are preceded with a hash symbol (#).

Commands that present dangers to the system through misuse are clearly marked. Such commands should not be used without research into the command's usage and function.

Command	Description	Typical Command Options	Examples of Use
\$ alias	Create or display command aliases		alias list=ls
\$ alsamixer	Alter audio volume levels		alsamixer
\$ apropos	Search man pages for specified words/phrases		apropos "word or phrase"

Command	Description	Typical Command Options	Examples of Use
\$ apt-cache	Search, query, and otherwise manipulate the APT database cache (see apt-get)	<p>search: Search for specified package (regexes may be used; see Chapter 15)</p> <p>showpkg: Show information about specified package</p> <p>depends: Show package dependencies of specified package, and show other packages that can meet that dependency</p>	<p>apt-cache search <i>packagename</i></p>
# apt-get	Multifunction tool use to install, remove, and otherwise administer software packages, according to the APT database	<p>install: search for and install specified package from repositories (as specified in /etc/apt/sources.list)</p> <p>update: Update or build package database by contacting package repositories</p> <p>upgrade: Attempt to upgrade all current installed packages with new versions</p> <p>dist-upgrade: Attempt to upgrade all currently installed packages, automatically and aggressively resolving package conflicts; often used to upgrade entire distro to new version</p> <p>remove: Opposite of install; removes packages</p> <p>clean: Remove any old package installation files that are stored on hard disk</p> <p>-f: Attempt to fix broken package dependencies (used with install or remove)</p> <p>--force-yes: Override any errors and thereby bypass apt-get's protective measures. Dangerous option—use with care!</p>	<p>apt-get install <i>packagename</i></p>

Command	Description	Typical Command Options	Examples of Use
\$ bzip2	Compress specified file (replaces original file with compressed file and gives it .bz2 file extension)	-d: Decompress specified file -k: Don't delete original file -t: Test; do a dry run without writing any data	<code>bzip2 myfile</code>
\$ bzip2recover	Attempt recovery of specified damaged .bz2 file		<code>bzip2recover myfile.tar.bz2</code>
\$ cal	Display calendar for current month (or specified month/year)		<code>cal 4 2005</code>
\$ cat	Display a file on screen or combine and display two files together		<code>cat myfile</code>
\$ cd	Change to specified directory		<code>cd /usr/bin</code>
\$ cdparanoia *	Convert CD audio tracks to hard disk files	-B: Batch mode; convert all tracks to individual files -S: Set CD read speed (2, 4, 8, 12, and so on; values relate to CD-drive spin speed; used to avoid read errors)	<code>cdparanoia -S 8 -B</code>
# cdrecord *	Burn audio or CD-R/RW data discs (the latter usually based on an ISO image; see <code>mkisofs</code>)	-dev=: Specify the drive's device number (can be discovered by running <code>cdrecord</code> with the <code>scanbus</code> option) --scanbus: Scan to see which CD-R/RW drives are present and return device numbers -speed=: Specify the write speed (2, 4, 6, 8, and so on) -v: Verbose output; obligatory for feedback on <code>cdrecord</code> 's progress	<code>cdrecord dev=0,0,0 -speed=16 -v myfile.iso</code>
# cfdisk *	DANGEROUS! Menu-based disk-partitioning program		<code>cfdisk /dev/hda</code>
# chgrp	Change group ownership of a file/directory	-R: Recursive; apply changes to subdirectories	<code>chgroup mygroup myfile</code>

Command	Description	Typical Command Options	Examples of Use
\$ chmod	Change permissions of a file/directory (where a=all, u=user, g=group; and r=read, w=write, x=executable)	-R: Recursive; apply to subdirectories --reference=: Copy permissions from specified file	chmod a+rw myfile
\$ chown	Change file ownership to specified username	-R: Recursive; apply to subdirectories	chown username myfile1
# chroot	Change the root of the file system to the specified path		chroot /home/mydirectory
# chvt	Switch to the specified virtual terminal (equivalent of holding down Ctrl+Alt and pressing F1–F6)		chvt 3
\$ clear	Clears terminal screen and places cursor at top		clear
\$ cp	Copy files	-r: Recursive; copy subdirectories and the files therein -s: Create symbolic link instead of copying	cp myfile1 directory/
\$ crontab	Edit or display the user's crontab file (scheduled tasks)	-e: Edit the crontab file (create/amend) -l: List crontab entries -r: Delete the crontab file -u: Specify a user and edit their crontab file	crontab -e
\$ date	Display the date and time		date
\$ df	Display free disk space within file system	-h: Human readable; display sizes in KB, MB, GB, and TB, as appropriate -l: Restrict to local file systems, as opposed to network mounts	df -h
\$ diff	Display differences between specified files	-a: Consider all files text files (don't halt when asked to compare binary files) -i: ignore lowercase and uppercase differences	diff myfile1 myfile2
\$ diff3	Display differences between three specified files		diff3 myfile1 myfile2 myfile3
\$ dig	Look up IP address of specified domain		dig mysite.com

Command	Description	Typical Command Options	Examples of Use
\$ dmesg	Display kernel message log		dmesg
# dosfsck *	Check and repair MS-DOS-based file hard disk partition (see also fsck)	-a: Repair without asking user for confirmation -r: Repair file system asking user for confirmation when two or more repair methods are possible -v: Verbose; display more information	dosfsck -rv /dev/hda4
# dpkg	Install, remove, and otherwise administer local installation packages (on your hard disk); see also apt-get	-i: Install specified package -r: Remove (uninstall) specified package -I: Show info about specified package --ignore-depends= <i>packagename.deb</i> : Don't halt on package dependency issues (dangerous!)	dpkg -i <i>packagename.deb</i>
# dpkg-reconfigure	Reconfigure an already installed package		dpkg-reconfigure <i>packagename</i>
\$ du	Show sizes of files and folders in kilobytes	-h: Human readable; produce output in MB, GB, and TB -s: Summary; display totals only for directories rather than for individual files	du -h /home/myuser
\$ eject	Eject a removable storage disk	-t: Close an already open tray	eject /media/dvd-rom
\$ ex *	Start a simple text-editor program used principally within shell scripts		ex <i>myfile.txt</i>
\$ exit	Log out of shell (end session)		exit
\$ fdformat	Low-level format a floppy disk (this won't create a file system; see also <i>mkfs</i>)		fdformat /dev/fdo
# fdisk *	DANGEROUS! Hard-disk partitioning program	-l: List partition table	fdisk /dev/hda
\$ fg	Brings job running in background to foreground		fg 1
\$ file	Display information about specified file, such as its type		file <i>myfile</i>

Command	Description	Typical Command Options	Examples of Use
\$ find *	Find files by searching directories (starting in current directory)	-maxdepth: Specify the number of subdirectories levels to delve into, starting from 1 (current directory) -name: Specify name of file to search for -type: Specify file types to be returned; -type d returns directories and -type f returns only files	find -name "myfile"
\$ free	Display information about memory usage	-m: Show figures in MB -t: Total the columns at bottom of table	free -m
# fsck *	Check file system for errors (usually run from rescue disc)		fsck /dev/hda1
\$ ftp *	FTP program for uploading/downloading to remote sites		ftp ftp.mysite.com
\$ fuser	Show which processes are using a particular file or file system	-v: Verbose; detailed output	fuser -v myfile
\$ grep *	Search specified file for specified text string (or word)	-i: Ignore uppercase and lowercase differences -r: Recursive; delve into subdirectories (if applicable) -s: Suppress error messages about inaccessible files and other problems	grep "phrase I want to find" myfile.txt
# groupadd	Create new group		groupadd mygroup
# groupdel	Delete specified group		groupdel mygroup
\$ groups	Display groups the specified user belongs to		groups myuser
\$ gzip	Compress files and replace original file with compressed version	-d: Decompress specified file -v: Verbose; display degree of compression	gzip myfile
# halt	Initiate shutdown procedure, ending all processes and unmounting all disks	-p: Power off system at end of shutdown procedure	halt -p

Command	Description	Typical Command Options	Examples of Use
# hdparm *	DANGEROUS! Tweak or view hard disk settings		hdparm /dev/hda
\$ head	Print topmost lines of text files (default is first 10 lines)	-n: Specify number of lines (such as -n 5)	head <i>myfile.txt</i>
\$ help	Display list of common BASH commands		help
\$ history	Display history file (a list of recently used commands)		history
\$ host	Query DNS server based on specified domain name or IP address	-d: Verbose; return more information -r: Force name server to return its cached information rather than query other authoritative servers	host 82.211.81.166
\$ hostname	Display localhost-style name of computer		hostname
\$ id	Display username and group info of specified user (or current user if none specified)		id <i>myuser</i>
# ifconfig *	Display or configure settings of a network interface (assign an IP address, subnet mask, and activate/deactivate it)	down: Disable interface (used at end of command chain) netmask: Specify a subnet mask up: Enable interface (used at end of command chain)	ifconfig <i>eth0</i> 192.168.0.10 netmask 255.255.0.0 up
\$ info *	Display info page for specified command		info <i>command</i>
# init	Change current run level		init 1
\$ jobs	Display list of jobs running in background		jobs
\$ kill	Kill specified process		kill 1433
\$ killall	Kill process(es) that have specified name(s)	-i: Confirm before killing process -v: Verbose; report if and when successful	killall <i>processnumber</i>
\$ last	Display details of recent logins, reboots, and shutdowns		last
\$ ldd	Display system files (libraries) required by specified program		ldd /usr/bin/ <i>program</i>

Command	Description	Typical Command Options	Examples of Use
\$ less	Interactively scroll through a text file	-q: Quiet; disable beeps when end of file is reached or other error encountered -i: Ignore case; make all searches case-insensitive unless uppercase letters are used	less <i>myfile.txt</i>
\$ ln	Create links to specified files, such as symbolic links	-s: Create symbolic link (default is hard link)	ln -s <i>myfile1 myfile2</i>
\$ lpr	Print file (send it to the printer spool/queue)	-V: Verbose; print information about progress of print job	lpr <i>myfile.txt</i>
\$ lpstat	Display print queue		lpstat
\$ ls	List directory	-a: List all files, including hidden files -d: List only directory names rather than their contents -h: Human readable; print figures in KB, MB, GB, and TB -l: Long list; include all details, such as file permissions -m: Show as comma-separated list	ls -h <i>mydirectory</i>
# lsmod	Display currently loaded kernel modules		lsmod
\$ lsof	Display any files currently in use	-u: Limit results to files used by specified user	lsof -u <i>username</i>
\$ man	Display specified command's manual		man <i>command</i>
\$ md5sum	Display MD5 checksum (normally used to confirm a file's integrity after download)		md5sum <i>myfile</i>
# mkfs *	DANGEROUS! Create specified file system on specified device (such as a floppy disk)	-t: Specify type of file system	mkfs -t <i>vfat /dev/fd0</i>

Command	Description	Typical Command Options	Examples of Use
\$ mkisofs *	Create ISO image file from specified directory (usually for burning to disc with crecord)	-o: Options; this must appear after command to indicate that command options follow -apple: Use Mac OS extensions to make disc readable on Apple computers -f: Follow symbolic links and source actual files -J: Use Joliet extensions (make ISO compatible with Windows) -R: Use Rock Ridge extensions (preferred Linux CD-ROM file system) -v: Verbose; display more information (-vv for even more info)	mkisofs -o <i>isoimage.iso</i> -R -J -v <i>mydirectory</i>
# modinfo	Display information about kernel module		modinfo <i>modulename</i>
# modprobe	Insert specified module into the kernel, as well as any others it relies on	-k: Set module's autoclean flag so it will be removed from memory after inactivity -r: Remove specified module as well as any it relies on to operate	modprobe <i>modulename</i>
\$ more	Interactively scroll through text file (similar to less)		more <i>myfile.txt</i>
# mount *	Mount specified file system at specified location	-o: Specify command options, such as <i>rw</i> to allow read/write access; various types of file systems have unique commands	mount <i>/dev/hda4 /mnt</i>
\$ mv	Move (or rename) specified files and/or directories	-b: Back up files before moving -v: Display details of actions carried out	mv <i>myfile mydirectory/</i>
\$ netstat *	Show current network connections		netstat -a

Command	Description	Typical Command Options	Examples of Use
\$ nice	Run specified command with specified priority	-n: Specify priority, ranging from the highest priority of -20, to 19, which is the lowest priority	nice -n 19
\$ nohup	Run specified command and continue to run it, even if user logs out		nohup <i>command</i>
\$ passwd	Change user's password		passwd
\$ ping	Check network connectivity between local machine and specified address	-w: Exit after specified number of seconds (such as -w 5)	ping <i>mydomain.com</i>
\$ printenv	Display all environment variables for current user		printenv
\$ ps *	Display currently running processes	a: List all processes (note that command options don't require preceding dash) f: Display ownership of processes using tree-style graphics u: Limit results to processes running for and started by current user x: Include processes in results not started by user but running with the user ID	ps aux
\$ pwd	Display current directory		pwd
# reboot	Reboot computer		reboot
\$ renice	Change a process's priority while it's running (see nice)		renice 19 10704
\$ rm	Delete single or multiple files and/or directories	-r: Recursive; delete specified directories and any subdirectories -f: Force; don't prompt for confirmation before deleting (use with care!)	rm -rf <i>mydirectory</i>
# rmmod	Delete module from kernel		rmmod <i>modulename</i>
# route *	Add and create (or view) entries in routing table (see ifconfig)		route add default gw 192.168.1.1
\$ runlevel	Display current run level		runlevel

Command	Description	Typical Command Options	Examples of Use
\$ screen *	Program that runs pseudo shell that is kept alive regardless of current user login	-ls: Display list of currently running screen sessions -R: Reattach to already running screen session or start new one if none available	screen
\$ sftp *	Secure Shell FTP; like FTP but running over an ssh connection (see ssh)		sftp <i>username@192.168.1.14</i>
\$ shred	Overwrite data in a file with gibberish, thereby making it irrecoverable	-u: Delete file in addition to overwriting -v: Verbose; show details of procedure -f: Force permissions to allow writing if necessary	shred -fv <i>myfile</i>
\$ sleep	Pause input for the specified period of time (where s=seconds, m=minutes, h=hours, d=days)		sleep 10m
\$ smbclient *	FTP-style program with which you can log in to a SMB (Windows)-based file share		smbclient //192.168.1.1/
\$ sort	Sort entries in the specified text file (default is ASCII sort)		sort <i>myfile.txt</i> -o <i>sorted.txt</i>
\$ ssh *	Log in to remote computer using secure shell		ssh <i>username@192.168.1.15</i>
\$ startx	Start GUI session (if GUI isn't already running)		startx
\$ su	Temporarily log in as specified user; log in as root if no user specified (provided root account is activated)	-: Adopt user's environment variables, such as \$PATH	su
\$ sudo	Execute specified command with root privileges		sudo <i>command</i>
\$ tac	Display specified text file but in reverse (from last to first line)		tac <i>myfile.txt</i>
\$ tail	Display final lines of specified text file	-n: Specify number of lines to display (such as -n4)	tail <i>myfile.txt</i>

Command	Description	Typical Command Options	Examples of Use
\$ tar *	Combine specified files and/or directories into one larger file, or extract from such a file	-c: Create new archive -j: Use bzip2 in order to compress (or decompress) files -f: Specifies filename (must be last in chain of command options) -r: Add files to existing archive -x: Extract files from existing archive -z: Use gzip to compress (or decompress) files	tar -zcf myfile.tar.gz mydirectory
\$ tee	Display piped output and also save it to specified file		ls -lh tee listing.txt
\$ top *	Program that both displays and lets the user manipulate processes		top
\$ touch	Give specified file current time and date stamp; if it doesn't exist, create a zero-byte file with that name		touch myfile
\$ tracepath	Discover and display network path to another host		tracepath 192.168.1.20
\$ umask	Set default permissions assigned to newly created files		umask u=rwx,g=r,o=
# umount	Unmount a file system		umount /media/cdrom
# useradd	Add new user	-m: Create home directory for user	useradd -m username
# userdel	Delete all mention of user in system configuration files (effectively deleting the user, although files owned by the user might remain)	-r: Remove user's home directory	userdel -r username
\$ unalias	Remove specified alias	-a: Remove all aliases (use with care!)	unalias command
\$ uname	Display technical information about current system	-a: Display all basic information	uname -a
\$ unzip	Unzip a Windows-compatible Zip file	-l: Display archive content but don't actually unzip	unzip myfile.zip

Command	Description	Typical Command Options	Examples of Use
\$ uptime	Display uptime for system, as well as CPU load average and logged-in users		uptime
\$ vi *	Text editor program		vi
\$ wc	Count the number of words in a file		wc <i>myfile.txt</i>
\$ whatis	Display one-line summary of specified command		whatis <i>command</i>
\$ whereis	Display information on where a binary command is located, along with its source code and man page (if applicable)	-b: Return information only about binary programs	whereis -b <i>command</i>
\$ xhost	Configure which users/systems can run programs on the X server	+: When followed by a username and/or system name, gives the user/system permission to run programs on the X server; when used on its own, lets <i>any</i> user/system use the X server -: Opposite of +	xhost +
\$ xinit	Start elementary GUI session (when not already running a GUI)		xinit
\$ zip	Create Windows-compatible compressed Zip files	-r: Recursive; includes all subdirectories and files therein -u: Updates Zip with specified file -P: Encrypts Zip with specified password -v: Verbose; display more information -#: Set compression level (from 0, which is no compression, to 9, which is highest)	zip -r <i>myfile.zip mydirectory</i>
\$ zipgrep	Searches inside Zip files for specified text string		zipgrep " <i>search phrase</i> " <i>myfile.zip</i>



Getting Further Help

So you've read through this book and have a good working knowledge of Linux. Ubuntu is running exactly as you want it to, and things are going okay. But then you hit a brick wall. Perhaps you want to perform a task but simply don't know how. Or maybe you know roughly what you need to do but don't know the specifics. Although, this book tries to be as comprehensive as possible, it can't cover every eventuality.

You need to find some help, but where do you turn? Fortunately, many sources of information are available to those who are willing to help themselves. Linux contains its own series of help files in the form of man and info pages, and these are good places to start. In addition, some programs come with their own documentation. If neither of these sources provides the help you need, you can head online and take advantage of the massive Linux community around the world.

Read the Manual!

Before asking for help online, it's important that you first attempt to solve your problems by using Linux's built-in documentation. If you go online and ask a question so simple that it can be answered with a little elementary research, you might find people reply with "RTFM." This stands for Read the Freaking Manual. In other words, do some basic research, and then come back if you're still stuck.

It's not that people online don't want to help. It's that they don't like people who are too lazy to help themselves and expect others to do the hard work for them. Although not all Linux people you encounter will take such a hard line, doing a little homework first can provide answers to a lot of questions, removing the need to ask others. This is particularly true when it comes to the fundamentals.

Documentation typically comes in three formats: man pages, info pages, and README files.

Man Pages

Man pages are the oldest form of Unix documentation. In the old days, once an individual had created a piece of software, he would write a brief but concise man page in order to give others a clue as to how to operate it. The programmer would come up with a few screens of documentation that could be called up from the command prompt. This documentation would outline what the software did and list all the ways in which it could be used.

Nowadays, depending on the software package, man pages are usually created by technical writers, but the concept of providing essential information still applies. Man pages under Linux provide all the information you need about how to use a particular command or piece of software.

Sounds great, doesn't it? Alas, there's a problem: man pages are written by software engineers *for* software engineers. They expect you to already understand the technology being discussed. This is illustrated very well by the man page for `cdrecord`, software that can be used to burn CD images to disc. You can view this man page by typing `man cdrecord` at the command prompt.

The first line of the man page states, "Cdrecord is used to record data or audio Compact Discs on an Orange Book CD-Recorder or to write DVD media on a DVD-Recorder."

Most of that is clear, but what do they mean by "Orange Book"? They don't explain. (If you're curious, head over to http://searchstorage.techtarget.com/sDefinition/0,,sid5_gci503648,00.html.)

Further down in the man page, you see, "Cdrecord is completely based on SCSI commands . . . Even ATAPI drives are just SCSI drives that inherently use the ATA packet interface as [a] SCSI command transport layer."

What's SCSI, or ATAPI for that matter? Again, the man page doesn't explain. (They're methods of interfacing with storage devices attached to your computer.)

But why should man pages explain as they go along? Their function is to describe how to use a piece of software, not to provide a beginner's introduction to technology. If they did that, a single man page could run to hundreds of pages.

In other words, man pages are not for complete beginners. This isn't always the case and, because Linux sees widespread usage nowadays, man pages are sometimes created with less knowledgeable users in mind. But even so, the format is inherently limited: man pages provide concise guides to using software. Luckily, there are some tips you can bear in mind to get the most from a man page. But before you can use those tips, you need to know how to read a man page.

How to Read a Man Page

To read a man page, you simply precede the command name with `man`. For example, to read the man page of `cdrecord`, a piece of software used to write ISO images to CD-R/RW discs, type the following command:

```
man cdrecord
```

This opens a simple text viewer with the man page displayed. You can move up and down line by line with the cursor keys, or move page by page using the Page Up and Page Down keys (these are sometimes labeled Pg Up and Pg Down). You can search by hitting the forward slash key (`/`). This will highlight all instances of the word you type. You can search for other examples of the word in the document by hitting the `n` key.

The average man page will include many headings, but the following are the most common:

Name: This is the name of the command. There will also be a one-sentence summary of the command.

Synopsis: This lists the command along with its various command options (sometimes known as *arguments* or *flags*). Effectively, it shows how the command can be used. It looks complicated, but the rules are simple. First is the command itself. This is in bold, which indicates it is mandatory. This rule applies to anything else in bold: it must be included

when the command is used. Anything contained within square brackets ([]) is optional, and this is usually where you will find the command options listed. A pipe symbol (|) separates any command options that are exclusive, which means that only one of them can be used. For example, if you see [apple|orange|pear], only one of apple, orange, or pear can be specified. Usually at the end of the Synopsis listing will be the main argument, typically the file(s) that the command is to work on and/or generate.

Description: This is a concise overview of the command's purpose.

Options: This explains what the various command options do, as first listed in the Synopsis section. Bearing in mind that command options tell the software how to work, this is often the most useful part of the man page.

Files: This lists any additional files that the command might require or use, such as configuration files.

Notes: If this section is present (and often it isn't), it sometimes attempts to further illuminate aspects of the command or the technology the command is designed to control. Unfortunately, Notes sections can be just as arcane as the rest of the man page.

See Also: This refers to the man pages of other commands that are linked to the command in question. If a number appears in brackets, this means the reference is to a specific section within the man page. To access this section, type: `man <section no> command`.

Although there are guidelines for the headings that should appear in man pages, as well as their formatting, the fact is that you may encounter other headings, or you may find nearly all of them omitted. Some man pages are the result of hours if not days of effort; others are written in ten minutes. Their quality can vary tremendously.

Tips for Working with Man Pages

The trick to quickly understanding a man page is decoding the Synopsis section. If you find it helps, split the nonobligatory command options from the mandatory parts. For example, `cdrecord`'s man page says that you *must* specify the `dev=` option (it's in bold), so at the very least, the command is going to require this:

```
cdrecord dev=X filename
```

Then you should skip to the Options section and work out which options are relevant to your requirements. While you're there, you'll also need to figure out what the `dev=` command option requires.

Although the command options contained in square brackets in the Synopsis section are, in theory, nonobligatory, the command might not work satisfactorily without some of them. For example, with `cdrecord`, I use the `-speed` command option, which sets the burn speed, and also the `-v` option, which provides verbose output (otherwise, the command runs silently and won't display any information on screen, including error messages!).

Another handy tip in decoding man pages is understanding what standard input and standard output are. In very simple terms, standard input (stdin) is the method by which a command gets input—the keyboard on most Linux setups. Standard output (stdout) is where the output of a command is sent, which is the screen on most Linux setups. (See Chapter 15 for more details about standard input and standard output.)

Often, a man page will state that the output of a command will be sent to standard output. In other words, unless you specify otherwise, its output will appear on screen. Therefore, it's necessary to specify a file to which the data will be sent, either by redirecting the output (see Chapter 17), or by specifying a file using a command option. For example, the `mkisofs` command can be used to create ISO images from a collection of files for subsequent burning to CD. But unless the `-o` option is used to specify a filename, `mkisofs`'s output will simply be sent to standard output—it will appear on the screen.

Finally, here's the best tip of all for using man pages: don't forget that man has its own man page. Simply type `man man`.

Info Pages

Man pages date from the days of relatively primitive computers. Back then, most computers could only display page after page of text, and allow the user to scroll through it. In addition, memory and disk space were scarce, which is why some man pages are incredibly concise—fewer words take up less memory!

The *Texinfo* system is a valiant by the GNU Project attempt to overcome the shortfalls of man pages. Often, this is referred to as *info*, because that's the command used to summon Texinfo pages (normally, you type `info command`).

For starters, info pages are more verbose than the equivalent man pages, and that gives the author more space to explain the command or software. This doesn't necessarily mean that info pages are easier to understand, but there's a better chance of that being the case.

Secondly, info pages contain hyperlinks, just like web pages. If you move the cursor over a hyperlinked word, which is usually indicated by an asterisk (*), you can proceed to a related page. In a similar sense, pages are linked together so that you can move back and forth from topic to topic.

The bad news is that the man page system is far more popular and established than Texinfo. If a programmer creates a new application, for example, it's unlikely he'll bother with an info page, but he will almost certainly produce a man page.

In fact, in many cases, typing `info command` will simply bring up the man page, except in the software used to browse info pages.

However, nearly all the GNU tools are documented using info pages, either in their own pages or as part of the `coreutils` pages. For example, to read about the `cp` command and how to use it, you can type this:

```
info coreutils cp
```

To browse through all sections of the `coreutils` pages, type this:

```
info coreutils
```

Because man pages are so established, everyone expects to find one for every utility. So most utilities that have info pages will also have man pages. But in such a case, the man page will state near the end that the main documentation for the utility is contained in an info page and you may find it more fruitful to use that instead.

Navigating through info pages is achieved via the keyboard and is something of an art. But, as you might expect, there's a user-friendly guide to using info: just type `info info`. Remember that words preceded with an asterisk are hyperlinks, and you can jump from link to link using the Tab key.

README Files and Other Documentation

Some programs come with their own documentation. This is designed to give users the information they need to get started with the program (as opposed to the man page, which is a concise and complete guide to the software). Alternatively, program documentation sometimes gives a brief outline of the program's features.

The files are usually simple text, so they can be read in any text editor or word processor, and are normally called README. Under Ubuntu, these documents are usually stored in a program-specific directory within `/usr/share/doc` (although a small minority of programs use `/usr/doc`).

Not all programs are friendly enough to provide such documentation, but even so, you'll still find a directory for the software in `/usr/share/doc`. This is because the software might also come with a getting started guide written by the Ubuntu package maintainer. Such guides detail specifics of using the software under Ubuntu, such as where configuration files are located or how the program interoperates with other software on the system. Sometimes, this documentation is written by a Debian package maintainer because nearly all Ubuntu software has its origins in the Debian project (www.debian.org).

In addition, the directory will probably contain copyright information, explaining the software license used by the software, as well as a CHANGELOG, which is a text file listing features that have been added to each release of the software. The directory might contain some other files, too, detailing where to send information about bugs, for example.

Viewing the README documentation is easy. For example, for the Gedit text editor, you could type this:

```
cd /usr/share/doc/gedit
less README
```

Sometimes, the README documentation is in a compressed tarball, in which case it will have either a `.tar.gz` or a `.tar.bz2` file extension. However, `less` is clever enough to realize this and extract the document for reading.

Getting Help Online

If you can't figure out the answer by referring to the documentation, then there's little choice other than to look online. Linux benefits from a massive community of users, all of whom are usually willing to help each other.

Usually, the best way of getting help is to visit a forum. Here, you can post messages for others to reply to. Alternatively, you might choose to sign up for a mailing list. This is a way of sending e-mail to several hundreds, if not thousands, of people at once. Any individual can then reply. Mailing lists often have the benefit of allowing personal attention and interaction, but this comes at the expense of each subscriber receiving a whole lot of mail.

Forums

The official Ubuntu project forums are located at www.ubuntuforums.org. You'll find forums for just about every need, from security to beginner's issues, but by far, the most popular is the one devoted to the current release of Ubuntu. At the time of writing, this was Ubuntu 5.10 Support (GNOME).

Before you can post, you need to register by providing an e-mail address. This is designed to keep down the quantity of unwanted junk postings to the forum.

You might think it fine to post a new question immediately after registering, but don't forget the simple rules mentioned at the beginning of this appendix: if you don't do elementary research first and try to solve your own problem, you may elicit a hostile response from the other posters, especially if your question is one that comes up time and time again, and has been answered several times.

So, first make use of the comprehensive search facility provided with the forums. For example, if you're looking for advice on getting a Foomatic D1000 scanner working, use this as a search term and see what comes up. The chances are that you won't be the first person who has run into problems with that piece of hardware, and someone else may have already posted a solution.

Often, you'll need to read the full thread to find an answer. Someone may start by asking the same question as you but, with the help and guidance of the forum members, they might find a solution, which they then post several messages later.

In addition, some individuals write their own HOWTO guides when they figure out how to do something. These are normally contained in the Customization Tips & Tricks forum.

If you're unable to find a solution by searching, then consider posting your own question. Keep your question simple, clear, and concise, because no one likes reading through acres of text. If possible, provide as many details about your system as you can. You will almost certainly want to provide the version number of the Linux kernel you're using, for example. You can find this version number by typing the following in a GNOME Terminal window:

```
uname -sr
```

In addition, any other details you can provide may prove handy. If you're asking about hardware, give its entire model name and/or number. Don't just ask for help with a Foomatic scanner. Ask for help with a Foomatic D1000 scanner, model number ADK1033, Revision 2. If you're asking about a piece of software, provide its version number (click Help ► About).

Sometimes in their replies, other forum members may ask you to post further details or to provide log files. If you don't understand the question, simply ask the poster to give you more details and, if necessary, instructions on what to do. Just be polite. Explain that you're a newbie. If you think the question is extremely obvious, then say so—apologize for asking what may be a stupid question, but explain that you've tried hard to answer it yourself but have failed. Don't forget that the Ubuntu forums include the Absolute Beginner Talk forum, where fundamental questions are asked all the time.

Mailing Lists

Using the forum's search function also has the advantage of searching the archives of the mailing lists.

Mailing lists have a number of advantages and disadvantages. The advantages are that a mailing list provides an excellent way to learn about Ubuntu. All you have to do is read through the e-mail messages you receive in order to partake of a constant information drip-feed. In addition, some mailing lists are designed to make public announcements, so you'll find it easy to learn about the latest happenings in the Ubuntu community.

Mailing lists also have a terrific sense of community. They offer a neat way of getting to know other Ubuntu users and talking to them. E-mails often drift off topic into humor and general discussion.

The disadvantages of mailing lists are that you can easily receive in excess of 200 messages a day, depending on which mailing list you join. Even if you have a moderately fast Internet connection, that quantity of messages can take a long time to download. In addition, you'll need to sort out any personal or business e-mail from the enormous quantity of mailing list traffic (although the mailing list messages usually have the list title in square brackets in the subject field; you can therefore create a mail rule that sorts the mail according to this).

You can sign up to the Ubuntu mailing lists at www.ubuntulinux.org/community/lists/document_view.

Other Official Sites

The Ubuntu Document Storage Facility (http://doc.gwos.org/index.php/Main_Page) is a guide put together by the individuals who maintain the Ubuntu forums. It contains a lot of information culled from the forums, not least of which is the Hardware Compatibility Guide. This lists hardware that is known to work with Ubuntu, or at least hardware that can be made to work with Ubuntu with a little effort, which often is also detailed.

The official Ubuntu web site, www.ubuntu.org, contains a Documentation section that features FAQs and a glossary of terms. Simply click the Documentation link on the right side of the main web page.

In addition, you might want to take a look at the Ubuntu wiki: <https://wiki.ubuntu.com>. This contains a whole world of fascinating information about Ubuntu, but can be somewhat difficult to navigate. Try starting with the Documentation pages: <https://wiki.ubuntu.com/UserDocumentation>.

Third-Party Sites

Of course, the Ubuntu project doesn't have a monopoly on sites that discuss Ubuntu. Several third-party web sites are worth at least an occasional visit, and other forum web sites are devoted to Linux.

One I visit on a regular basis is the Ubuntu blog: <http://ubuntu.wordpress.com>. This is written by a relative newcomer to Ubuntu who has chosen the Ubuntu distribution for his computer. It details discoveries that Carthik Sharmahas made about Ubuntu, such as configuration options, online sources of software, how to overcome hardware issues, and so on.

In addition, I like to visit <http://linuxhelp.blogspot.com>, which is a similar blog written by a Linux user who uses Ubuntu and likes to share tips and techniques.

Perhaps the king of third-party Ubuntu sites is Ubuntu Guide: <http://ubuntuguide.org>. This contains brief instructions on how to do a variety of common tasks under Ubuntu, such as installing certain types of software or administering particular hardware. It covers a lot of the same ground as this book, but is still worth investigating if you wish to browse through some excellent tips and advice.

Finally, one of the best Linux forums and general advice sites can be found at www.linuxquestions.org. This has a forum dedicated specifically to Ubuntu, but also contains hundreds more devoted to just about every aspect of Linux, including forums for beginners.



Other Versions of Ubuntu

The nature of open-source software encourages diversification, so it should come as no surprise that, along with the main release of Ubuntu, there are several offshoot projects. All of these take the standard Ubuntu release as a base but tweak it to various degrees, perhaps to use a different graphical desktop system or to cater to different types of users.

This appendix lists a number of such projects. Perhaps it goes without saying that all these projects are free of charge, just like Ubuntu, and are only a download away.

Kubuntu

The standard Ubuntu release, as supplied with this book, relies on the GNOME Desktop Project for its graphical interface (see www.gnome.org). Many other desktop projects exist in the wider Linux world, but perhaps the only one that ranks alongside GNOME in terms of popularity is the K Desktop Environment project (www.kde.org), usually referred to as KDE. Kubuntu is simply a version of Ubuntu that eschews GNOME in favor of KDE.

Kubuntu (www.kubuntu.org) retains the same philosophy as Ubuntu, in both its humanitarian aims of being available to all as well as its more pragmatic aspects, such as always including the latest versions of applications. It also shares many technical features, such as the use of `sudo` to invoke superuser powers.

The main difference is the software bundled with this variant. When it comes to e-mail, KDE's KMail program is used instead of Evolution, for example, and Konqueror is used for browsing instead of Firefox (although, of course, Evolution and Firefox can easily be installed via the Synaptic Package Manager after Kubuntu has been installed). The system configuration software is radically different, too, with several KDE tools used instead of the GNOME software described in this book.

To try Kubuntu, you can either download an ISO image for burning to CD-R/RW from <http://releases.ubuntu.com>, or simply search for and install the `kubuntu-desktop` package using the Synaptic Package Manager. This will then install all the Kubuntu components. Once it's installed, you can opt to boot into Kubuntu by click the Session button on the login screen and selecting the KDE entry from the list.

Edubuntu

The Ubuntu philosophy is to make an operating system accessible by everyone, no matter who they are or where they live in the world. Of course, young people are included in this vision, and Edubuntu (www.edubuntu.org) is a version of Ubuntu specifically geared towards their needs. It's a rendition of the standard Ubuntu release that's been bolstered by many educational software titles. In addition, it has a friendlier and simpler interface that's designed to appeal to youngsters.

The chief education titles are KDE Edutainment Suite, GCompris, and Tux4Kids. KDE Edutainment Suite (<http://edu.kde.org>) contains games involving mathematics, languages, science, and other miscellaneous topics. Teachers might also appreciate the inclusion of KEduca, a program designed to create form-based tests and exams.

GCompris (<http://gcompris.net>) is for children of kindergarten age and introduces them to computer use as well as elementary math and reading skills. Tux4Kids includes a typing tutor, publishing program, and a handful of games geared towards math and literacy skills.

The main benefit of Edubuntu for educational establishments is that it's both free of charge and comes with the same kind of update support as Ubuntu, meaning security updates will be available for at least 18 months after the initial release.

Ubuntu Server

The standard version of Ubuntu, as supplied with this book, is designed primarily for desktop computers (sometimes referred to as *workstations*). It can be used as an elementary server operating system, but for more demanding tasks, additional configuration is necessary. A much better choice for practically any kind of server need is Ubuntu Server (<http://releases.ubuntu.com/ubuntu-server>).

Servers are computers whose sole purpose in life is to both store and make available data or resources for other computers via a network connection. For example, a *file server* is a central repository of files that's often used in offices or other establishments. A *web server* is a computer that's connected to the Internet and provides web pages and other data for web surfers. You might also have heard of e-mail servers, FTP servers, and others.

Many Linux server operating systems can be difficult to use and hard to set up. Ubuntu Server overcomes these issues while attaining hardware certification and maintaining quality-assurance levels. Certification is an award given out by manufacturers that guarantees their hardware will work under certain operating systems. The Ubuntu Server project's goal is to achieve this for most common types of server hardware. Quality assurance is a way of guaranteeing that the operating system can be relied on to be stable.

In terms of ease of use, the Ubuntu Server project aims to create a server operating system that can be used by all levels of users, not just experts. For those who have little experience of Linux but need to create a server system, it's an excellent choice.

UBUNTU UPDATES

The Ubuntu Foundation is unique in the world of Linux distributions in that it works to a six-month release cycle. This means a new version of Ubuntu comes out every half year. Most other Linux distros are released yearly at best, although it's not unusual for several years to pass before the release of a new version of some distros.

The version of Ubuntu offered with this book is 5.10, code-named Breezy Badger (each release receives a humorous code name, usually related to animals). This was the latest release available as this book was being written. By the time you read this, it's very likely there will be a new release of Ubuntu available.

You can update to the latest version of Ubuntu in two ways. The first is to download the ISO image of the latest release from <http://releases.ubuntu.com> and burn it to CD. This can be done within Ubuntu by right-clicking the ISO file and selecting Write to Disc (ensure you select a relatively slow burn speed in the dialog box that appears; setting a fast write speed will probably result in a unusable disc). Then, when the CD has been burnt, simply reinsert it into the CD/DVD-ROM drive. When you insert the CD, Ubuntu will ask if you want to upgrade to the version of the CD.

The other way of upgrading is to open a GNOME Terminal window (Applications ► Accessories ► Terminal) and type the following:

```
sudo apt-get dist-upgrade
```

This will then download all the packages for the latest release of Ubuntu and attempt to update your system.

Xubuntu

While GNOME and KDE dominate the desktop interface landscape of Linux, and they are used in the main Ubuntu and Kubuntu releases, respectively, other projects take a different approach to the graphical desktop. XFCE (www.xfce.org) is one of these. It's a streamlined desktop that retains the good looks of GNOME but is much smaller in terms of memory footprint. This means that a system running XFCE is faster than an equivalent GNOME system. It also means that XFCE can be used on many older computers that don't have the powerful hardware we take for granted nowadays and which would struggle with the latest GNOME and KDE releases of Ubuntu.

Because a key component of the Ubuntu Foundation's philosophy is to create an operating system that can be used by anyone, regardless of where they are in the world, a version of Ubuntu that can run on older hardware makes a lot of sense. It's unlikely that less developed countries will have access to the latest expensive computer hardware, for example.

Xubuntu (<https://wiki.ubuntu.com/Xubuntu>) is simply a version of Ubuntu that replaces GNOME with XFCE. Despite XFCE's claim to be lightweight, it still offers a high degree of usability and shouldn't be seen as a second-best choice for stripped-down hardware. It's certainly worth trying out. It also uses many modern GUI aspects we take for granted, such as theming (see Chapter 10) and font antialiasing.

As with Kubuntu, you can upgrade to Xubuntu by either burning a CD or by using APT via the following command:

```
sudo apt-get install xubuntu-desktop
```

Alternatively, just search for `xubuntu-desktop` using the Synaptic Package Manager. Once it's installed, select XFCE after clicking the Session button on the login screen.

Other Ubuntu Projects

If you have an Apple Macintosh computer that uses a G3, G4, or G5 processor, you can download the PowerPC version of Ubuntu. This is identical to the standard Ubuntu release in practically every way. The release works on iBook and PowerBooks, too.

There's also a version of Ubuntu for 64-bit processors. This includes those that use the AMD64 instruction set, such as AMD's Athlon 64 chips and Intel Pentium 4 processors that feature EMT64 support (Intel's earlier Itanium range of 64-bit chips aren't supported). Once again, this release is practically identical to the main Ubuntu release. The only difference is that the software has been compiled for 64-bit processors.

Ubuntu offers a number of "live" distros. These are versions of Ubuntu that run from the CD and don't install to the hard disk. Live distros are handy for introducing Ubuntu to friends who aren't yet ready to abandon Windows. A disadvantage is that Ubuntu runs a little slowly because the data must be read from the CD/DVD-ROM drive, rather than from the hard disk. You can find live versions of practically all the main Ubuntu releases, including Ubuntu, Kubuntu, and PowerPC.

nUbuntu (<http://nubuntu.org>) is a version of Ubuntu geared towards those who work in the computer security field and includes many network security testing tools. It can also be used by power users. It features the FluxBox desktop interface (<http://fluxbox.sourceforge.net>) instead of GNOME or KDE.

All of these releases, with the exception of nUbuntu, are available for download as ISO images at the Ubuntu download site: <http://releases.ubuntu.com>. To burn any ISO to CD, insert a blank CD, right-click the ISO file, and select Write to Disc. Make sure you select a slow burn speed in order to obtain a usable disc.

Index

Symbols

--- (three dashes), 226
\$ (dollar symbol), 207
\$ command, vi command mode, 246
\$PATH variable, 267
%CPU column, top program, 259
%MEM column, top program, 259
& (ampersand symbol), 264
* (asterisk), 532
* wildcard, 251
| (pipe symbol), 254
| symbol, 273
~ (tilde), 474
< (left angle bracket), 254
= (equal sign), Calc, 355
> (angle bracket), 274
> (right angle bracket), 254
! (exclamation mark), 271, 484
/ (forward slash), 183
. (period), 235, 463
? (question mark), 242
/ (slash), 242
! command, sftp, 485
/ command, vi command mode, 246
? command, vi command mode, 246

A

a command option, 254, 463
A command, vi command mode, 246
AbiWord word processor, 428
acceleration, 146
Acceleration setting, 146
Access Path field, 193

Accessibility option, OpenOffice.org, 335
Accessibility tab, GNOME Display Manager, 149
Accessibility tools, 150
accessing computers remotely. *See* remote access to computers
Account tab, 438
acpid service, 448
acpi-supply, 448
Active Directory/Global Address List, 103
adaptname, 89
Add Directory button, 466
Add File button, 466
Add New button, 475
Add to Panel option, 156
Add Wallpaper button, 143
Address Cards view, Contacts mode (Evolution), 394
adm system group, 440
admin system group, 441
administrator account, 65
Adobe Photoshop 6, 409
Advanced option, 58
Advanced Packaging Tool (APT), 417, 459
Advanced tab, 438
age of Linux, 5–6
Airbrush tool, GIMP, 305
Alcatel SpeedTouch series USB DSL modem, 92, 95–98
alias command, 515
alsa service, 448
alsamixer command, 515
alsa-utils service, 448
Altering Permissions section, 226

- AMD64 instruction set, 540
 - ampersand symbol (&), 264
 - anacron, 449, 476–477
 - angle bracket (>), 274
 - animating slides, 366–367
 - Animation filters, GIMP, 315
 - Ant screensavers, 118
 - antialiasing, 144
 - antivirus software, 6, 129
 - API (Application Programming Interface), 401
 - apmd service, 449
 - Appearance option, OpenOffice.org, 335
 - applets, 156
 - Application category, OpenOffice.org, 332
 - Application Programming Interface (API), 401
 - applications. *See* programs
 - Applications menu, 67, 71, 155, 161
 - Apply button, Synaptic Package Manager toolbar, 422
 - apropos command, 515
 - APT (Advanced Packaging Tool), 417, 459
 - APT and package repositories
 - categories of repositories, 418–419
 - overview, 417–418
 - repository sections, 419–420
 - APT tools
 - installing and removing packages, 427–428
 - overview, 426–427
 - querying packages and repositories, 429–430
 - updating system, 428
 - apt-cache command, 516
 - apt-cache depends packagename |less command, 429
 - apt-cache search packagename command, 429
 - apt-cache show packagename |less command, 429
 - apt-get command, 427, 431, 516
 - Archive Manager, 177
 - Artistic filters, GIMP, 314
 - As Character option, Writer, 346
 - Assistive Technology Support, 150
 - asterisk (*), 532
 - at command, 477–478
 - atd service, 449
 - ATI 3D cards, 116
 - ATI driver, installing, 117
 - atq job number, 478
 - Audio file types, 191
 - audio group, 440
 - audio playback programs, 171–172
 - audio system group, 440
 - AutoCaption option, OpenOffice.org Writer, 337
 - autocomplete function, 268
 - autocompletion, BASH shell
 - with files and paths, 268
 - overview, 267
 - viewing available options, 268–269
 - Autohinting, 145
 - automatic partitioning tool, 39
 - Available Backups drop-down list, 468
 - Away icon, Gaim, 178
- B**
- b command, vi command mode, 246
 - ba commands, 268
 - background (bottom) color box, 305
 - Background option, OpenOffice.org Writer/Web, 337
 - backing up data
 - choosing data to back up, 463–464
 - from command line
 - compressing tar archives, 469–470
 - creating tar files, 469
 - extracting files from tar archive, 470
 - overview, 468
 - saving file to CD-R/RW, 471
 - viewing tar archive information, 470

- e-mail, 30–31
- making notes, 31–32
- overview, 29–30, 463
- using SBackup
 - changing backup file destination, 467
 - changing time period between backups, 467–468
 - excluding files and folders, 466
 - including files and folders, 466
 - overview, 464–466
 - restoring data via SBackup, 468
- Backports repository, 419
- backslash (\), 183
- Backspace key, 249
- Backup Properties dialog box, 465
- bang, 271
- Base (database program), 167
 - creating database
 - adding controls to form manually, 378–379
 - adding table, 375–377
 - creating form, 377–378
 - editing database table, 379–380
 - overview, 375
 - getting started with, 373–375
 - overview, 373
 - using database, 380–381
- Base program window, 374
- BASH shell, 204
 - autocompletion
 - with files and paths, 268
 - overview, 267
 - viewing available options, 268–269
 - command history, 271–272
 - commands, 257, 515–527
 - getting help, 209–210
 - keyboard shortcuts
 - overview, 269
 - for system control, 270–271
 - for working in BASH, 269–270
 - overview, 203–208, 267
 - piping and directing output
 - of commands, 272–274
 - overview, 272
 - redirecting output, 274–275
 - reasons for using, 205–206
 - running programs, 208–209
 - running via virtual console, 210–211
 - when to use, 206–207
 - working with files
 - changing and creating directories, 217
 - copying files, 214–215
 - deleting files, 216–217
 - listing files, 213–214
 - moving files, 215–216
 - overview, 211–213
- BASIC category, OpenOffice.org, 332
- Basic Fonts (Western) option, Writer, 336
- BBC (British Broadcasting Corporation), 295
- benchmarking hard disk, 452–453
- benefits of Linux, 8–9
- bin directory, 230
- binary file, 414
- binary value, 167
- BIOS, 34, 47–48, 443
- BitTorrent file sharing application, 133
- Bksp key, GNOME Calculator, 175
- blank screens, 51
- Bluetooth, 447
 - overview, 118–119
 - pairing devices, 119
 - transferring files between devices, 120–121
 - using keyboard or mouse, 122–123
- Bluetooth File Sharing, 120
- Bluetooth Manager, 120
- bluez-uti, 449
- Blur filters, GIMP, 311
- Blur/sharpen tool, GIMP, 305

- Boolean value, 167
- Boot Device Priority, 34
- boot directory, 230
- boot loaders, 26, 63–64
- boot sectors, 26
- Boot Sequence, 34
- booting
 - for first time, 45–46
 - cutting and pasting text, 74
 - exploring desktop, 66–71
 - logging in, 64–65
 - overview, 63
 - running programs, 71–72
 - starting up, 63–64
 - using mouse, 73–74
 - working with virtual desktops, 72–73
 - speeding up
 - initialization and run-level services, 446–452
 - overview, 443–445
 - reducing boot menu delay, 445
- /boot/grub/menu.lst file, 445
- bootlogd service, 449
- Borders icon, Writer, 349
- Breezy Badger, 420, 539
- Brightness/Contrast menu option, 308
- British Broadcasting Corporation (BBC), 295
- browser dialog box, GIMP, 302
- Brush tool, GIMP, 305
- BT Voyager USB ADSL modem, 92–95
- buffers, GIMP, 306
- bugs, and proprietary drivers, 78
- build-essential metapackage, 431
- Burn and dodge tool, GIMP, 305
- Buttons tab, Mouse Preferences dialog box, 146
- By Company view, Contacts mode, Evolution, 394
- Bytecode Interpreting, 145
- bzip2 program, 177, 469, 517
- bzip2recover command, 517

C

- c command option, 469
- c hdparm command option, 454
- cable broadband, 81
- cache of package files, emptying, 459–460
- cal command, 517
- Calc (spreadsheet program), 165–166
 - creating charts, 359–361
 - deleting and inserting data and cells, 356
 - entering and formatting data, 355–356
 - overview, 355
 - sorting data, 359
 - using filters, 361
 - working with formulas
 - overview, 356–357
 - summing figures, 358
 - using Function Wizard, 357
- Calculate option, Calc, 337
- Calculator, 162, 175–176
- Calendar view, Evolution, 168
- Calendars mode, Evolution, 385
 - adding or editing diary entry, 397–398
 - overview, 396
 - specifying appointment types, 396
- camera. *See* digital cameras
- case sensitivity, 184
- cat command, 232, 241, 274, 517
- Category drop-down list, Calc, 357
- cd command, 272, 484, 517
- cdparanoia * command, 517
- CD player, 162
- CD/DVD burning, 50, 162, 173
- cdrecord command, 275, 471, 517
- /cdrom directory, 230, 232
- cdrom system group, 440
- CD-R/RW, saving backup file to, 471
- CDs (compact discs)
 - audio, listening to, 283–284
 - creating own, 288–289

- ripping music from
 - adding MP3 support to Sound Juicer, 286–287
 - choosing format, 285–286
 - overview, 285
 - process, 287–288
- cells, in Calc, 356
- centered option, Style drop-down list, 144
- central file server, 220
- cfdisk command, 460, 517
- Change Icon, 333
- Changes option
 - Calc, 337
 - Writer, 337
- Character option, Writer, 344
- charts, Calc, 359–361
- chgrp command, 517
- child processes, 261
- chmod +w README command, 249
- chmod command, 227, 518
- chown command, 468, 518
- chroot command, 518
- chvt command, 518
- Cinelerra software suite, 299
- ClamAV, 129
- clear command, 518
- Clearlooks theme, 140
- clock, 68
- cloning, in GIMP, 309–310
- coder-decoder, 280
- coding/decoding, 90
- color, correcting, in GIMP, 308–309
- Color filters, GIMP, 312
- color ink-jet models, 107
- Color picker tool, GIMP, 304
- Color region selection tool, GIMP, 303
- color-coding, within GNOME Terminal, 221
- Colors option, OpenOffice.org, 335
- Combine filters, GIMP, 315
- COMMAND column, top program, 259
- !command command, sftp, 485
- command history, BASH shell, 271–272
- command line
 - adding and deleting users at, 439–441
 - backing up data from
 - compressing tar archives, 469–470
 - creating tar files, 469
 - extracting files from tar archive, 470
 - overview, 468
 - saving file to CD-R/RW, 471
 - viewing tar archive information, 470
- Command mode, vi text editor, 245–246
- command prompts, 207
- command-line mode, 249
- Command-Line mode, vi text editor, 247–248
- command-line prompts, 203
- command-line shell, 204–206, 229, 243, 250
- commands, piping and directing output of, 272–274
- comma-separated values (CSV), 166, 321, 349
- community, 9–10
- compact discs. *See* CDs
- compatibility, 8–9, 321–323
- Compatibility option, Writer, 337
- compiling a kernel, 458
- composing e-mail messages, 388
- Compressed file types, 191
- compressing tar archives, 469–470
- computer memory cards, 111
- Computer window, 197
- configuration dialog box, GIMP, 174
- Configuration Editor program, 155
- configuration options, 334
- configuration software, 20
- configuration tools, 21
- configure script, 433

- configuring
 - Firestarter
 - overview, 132–133
 - setting inbound rules, 133–134
 - setting outbound rules, 134–135
 - turning off diagnostic services, 135–136
 - monitor, 44–45
 - Wine, 403–406
 - Connections option, Base, 338
 - Contact List Editor pane, Evolution, 396
 - Contacts manager/calendar, 162
 - Contacts mode, Evolution, 384
 - adding or editing contact information, 395
 - creating contact list, 396
 - overview, 394
 - Contacts view, Evolution, 168
 - Content Scrambling System (CSS), 296
 - context menu, Writer, 344
 - Contiguous regions selection tool, GIMP, 303
 - Control Panel function, Windows, 70
 - controls, 141
 - Controls category, OpenOffice.org, 332
 - copying
 - files, BASH shell, 214–215
 - Windows fonts, 323–325
 - copyleft, 14
 - core fonts, 323
 - costs of Linux, 8
 - cp command, 214, 518
 - cp program, 237
 - cpio command, 468
 - CPU Frequency Scaling Monitor, GNOME, 102
 - crashes, 8
 - Create Form, Base, 377
 - Create Launcher dialog box, 152
 - cron, 449, 473
 - crontab, 473–474, 477, 518
 - creating scheduled task with, 474–475
 - editing with GUI, 475
 - overview, 473
 - Crop tool, GIMP, 304, 309
 - cropping, in GIMP, 309–310
 - CrossOver Office, 299
 - CSS (Content Scrambling System), 296
 - CSV (comma-separated values), 166, 321, 349
 - CUPS Printer (IPP), 108
 - cupsys service, 449
 - Currency icon, Calc, 355
 - cursor keys, 33, 36, 64, 245
 - Cursors tab, Mouse Preferences dialog box, 146
 - Custom Animation dialog box, 366–367
 - Custom backup mode, 465
 - Custom button, Synaptic Package Manager toolbar, 421
 - Customize dialog box, 333
 - cutting and pasting text, 74
- D**
- D command, vi command mode, 245
 - Data category, OpenOffice.org, 332
 - Database pane, Base, 374, 380
 - Database Wizard, 373
 - databases. *See* Base
 - Databases option, Base, 338
 - date command, 518
 - db command, vi command mode, 245
 - dbus service, 449
 - dd command, vi command mode, 245
 - deactivating
 - prelinking, 457–458
 - spell-checking, 346
 - .deb package, 424
 - Debian distribution, 22
 - Debian package maintainer, 533

- Debian package-management system, 415, 430
- DeCSS software, 296
- Default Colors option, Chart, 338
- default mode, GNOME Calculator, 175
- Delete key, Calc, 356
- Delete This Panel option, 156
- deleting
 - data and cells, in Calc, 356
 - e-mail messages, 386–387
 - files, BASH shell, 216–217
 - menus, 155
 - Windows partition, 39
- denial-of-service (DoS) attacks, 135
- dependencies, 416, 425, 431–432
 - management, 416–417, 423
 - resolution, 417
- Description heading, man page, 531
- desktop, 66
 - adding shortcuts
 - creating launcher, 152–153
 - creating link, 153–154
 - overview, 152
 - applets, 156
 - elements, 68–69
 - first impressions, 66–67
 - games, 163
 - menus
 - adding all menus to Panel, 154
 - adding Applications menu to Panel, 154–155
 - deleting, 155
 - overview, 154
 - overview, 66, 152
 - panels, personalizing, 156
 - quick desktop guides, 69–71
- /dev directory, 219, 230
- devbootstrap directory, 230
- devel libraries, GTK+ 1.2, 432
- /dev/hda primary master, 460
- /dev/hdc secondary master, 460
- Device Manager, 79, 88
- df command, 238, 518
- DHCP (Dynamic Host Configuration Protocol), 37, 82
- DHCP (Dynamic Host Control Protocol), 82
- dialout system group, 440
- dial-up Internet access, configuring, 90–92
- Dictionary, 177–178
- diff command, 254, 518
- diff3 command, 254, 518
- dig command, 518
- digital cameras, transferring photos from
 - overview, 111
 - using camera's cable connection, 113
 - using card reader, 111–113
- digital images, 30
- digital music
 - creating own CDs, 288–289
 - legalities of playback, 279–280
 - listening to audio CDs, 283–284
 - online radio stations, 284
 - overview, 279
 - playing music files
 - installing codecs, 280–281
 - overview, 280
 - using Rhythmbox, 282–283
 - ripping music from CDs
 - adding MP3 support to Sound Juicer, 286–287
 - choosing format, 285–286
 - overview, 285
 - process, 287–288
- Digital Rights Management (DRM), 279, 296
- Dillo web browser, 431
- dip system group, 440
- Direct Memory Access (DMA), 455
- directing output. *See* piping and directing output
- directories, 185, 217

- Disk Cleanup tool, 28
 - disk drive, adding another
 - configuring Ubuntu to use, 461
 - overview, 460
 - partitioning disk, 460–461
 - Disk Management tool, 25
 - Disks Manager program, 193–194
 - Display Power Management section, 158
 - Distorts filters, GIMP, 313
 - distributions of Linux, 16
 - DivX format, 292
 - DMA (Direct Memory Access), 455
 - dmesg command, 519
 - DNS server addresses, 82
 - dns-clean service, 449
 - Do Backups drop-down list, Time tab, 467
 - Document area, OpenOffice.org, 330
 - Document protection, OpenOffice.org, 321
 - documentation. *See* manual
 - Documents category, OpenOffice.org, 332
 - dollar symbol (\$), 207
 - DoS (denial-of-service) attacks, 135
 - DOS (FAT), File System Type box, 198
 - DOS command prompt, 203
 - dosfsck * command, 519
 - dots per inch (DPI), 301
 - Download Package Files Only, 422
 - downloading Wine, 401–403
 - DPI (dots per inch), 301
 - dpkg command, 519
 - installing packages, 424–425
 - overview, 424
 - querying packages, 426
 - uninstalling packages, 426
 - dpkg -I packagename.i386.deb |less querying package, 426
 - dpkg -l packagename querying package, 426
 - dpkg-reconfigure command, 519
 - dpkg -s packagename |less querying package, 426
 - dragging-and-dropping files, 190
 - Drawing category, OpenOffice.org, 332
 - drawing programs, 162
 - Drawing toolbar
 - Evolution, 167
 - Impress, 366, 369
 - drive references, 183
 - drivename, 89
 - drivers, proprietary vs. open-source, 78–79
 - DRM (Digital Rights Management), 279, 296
 - DSL, 81, 98
 - du command, 237, 519
 - dual-boot setup, 25
 - dummy C:/ drive, 408
 - DVDs, 296–297
 - dw command, vi command mode, 245
 - Dynamic Host Configuration Protocol (DHCP), 37, 82
 - Dynamic Host Control Protocol (DHCP), 82
- E**
- e2fsprogs-udeb file, 50
 - echo command, 208
 - Edge Detect filters, GIMP, 312
 - Edit category, OpenOffice.org, 332
 - editing images. *See* image editing
 - Edubuntu, 538
 - Edutainment Suite, KDE, 538
 - Effect Options dialog box, 367
 - Eject button, 197
 - eject command, 519
 - ejecting media from drives, 197–198
 - Elliptical selection tool, GIMP, 303
 - Emacs text editor, 244, 269
 - e-mail
 - backing up, 30–31
 - composing messages, 388
 - configuring, 103–105
 - creating new folders, 390–391
 - creating search folders, 394

- creating signatures, 389–390
- deleting messages, 386–387
- flagging messages, 387–388
- junk e-mail, 391
- overview, 390
- reading, 386
- sending and receiving, 385–386
- sorting and filtering messages, 392–393
- E-mail option, OpenOffice.org, 338
- e-mail programs, 162, 168–169
- emblems, 188
- Emphasis option, Add button dialog box, 366
- Enable button, 193
- encoding, 280
- encryption key, 85, 481, 484
- End User License Agreements, Microsoft's, 404
- end-of-file (EOF), 270
- End-User License Agreement (EULA), 15
- Enhance filters, GIMP, 312
- entering data, in Calc, 355–356
- Entrance option, Add button dialog box, 366
- EOF (end-of-file), 270
- equal sign (=), Calc, 355
- Erase tool, GIMP, 305
- error dialog box, 406
- error messages, 49
- Escape key, Totem Movie Player, 173
- /etc directory, 230, 232
- /etc/crontab/ file, 473
- /etc/fstab configuration file, 406
- /etc/hdparm.conf file, 455
- /etc/inittab file, 211
- Ethernet cable, 108
- Ethernet card
 - configuring Network Card via DHCP, 82
 - configuring static IP address, 82–83
 - overview, 81
- Ethernet port, 93
- EULA (End-User License Agreement), 15
- evms service, 449
- Evolution (email/personal information management program), 19, 103, 168–169
 - Calendars mode
 - adding or editing diary entry, 397–398
 - overview, 396
 - specifying appointment types, 396
 - Contacts mode
 - adding or editing contact information, 395
 - creating contact list, 396
 - overview, 394
 - Mail mode
 - composing message, 388
 - creating e-mail signature, 389–390
 - creating new folders, 390–391
 - creating search folders, 394
 - deleting messages, 386–387
 - flagging messages, 387–388
 - junk e-mail, 391
 - overview, 390
 - reading e-mail, 386
 - sending and receiving e-mail, 385–386
 - sorting and filtering messages, 392–393
 - modes, overview of, 383–385
 - overview, 383
 - Tasks mode, 398–399
- ex * command, 519
- exclamation mark (!), 271, 484
- .exe file installer, 413
- Execute Actions drop-down list, Evolution, 393
- exit command, BASH, 519
- exit command, sftp, 485
- Exit option, Add button dialog box, 366
- Exit Saving Changes option, 34
- Expand box option, 156
- ext2 file system, 231

ext3 file system, 231
 Extract button, Archive Manager, 177
 extracting files from tar archive, 470

F

Face Browser feature, 151
 FAT32 partitions, 192
 fax system group, 441
 fdformat command, 519
 fdisk command, 233, 519
 fetchmail service, 449
 fg command, 519
 fields, Writer, 352
 file browser window, Nautilus, 188, 195
 file command, 519
 file compatibility, OpenOffice.org, 321–323
 File Format drop-down list, 167, 370
 file formats, OpenOffice.org, 341
 file management

- accessing removable storage devices
 - ejecting media from drives, 197–198
 - formatting floppies, 198
 - overview, 196–197
- accessing Windows files
 - accessing networked files, 195–196
 - overview, 192
 - working with files in Windows partitions, 192–195
- file system concepts
 - case sensitivity, 184
 - drive references, 183
 - file access and storage, 184–186
 - overview, 183
- launching files and running programs, 190–191
- overview, 183
- using Nautilus
 - file and folder icons, 188–189
 - overview, 186–188
 - special windows, 189–190

file permissions. *See* users and file permissions
 file server, 538
 file system, 228–231
 file type codes, 224
 File Types tab, 466
 files. *See also* file management; users and file permissions

- free space, 238
- searching for
 - overview, 235
 - using find command, 235–236
 - using locate command, 236–237
 - using whereis command, 237
- size of, viewing, 237–238
- virtual files, 219–221

Files heading, man page, 531
 fill screen option, Style drop-down list, 144
 Fill tool, GIMP, 304
 Filter function, Calc, 361
 filters

- in Calc, 361
- in Evolution, 392–393
- in GIMP, 311–315

find command, 235–236, 520
 Find Files function, Windows, 70
 Firefox web browser, 169–170, 261
 firefox-bin process, 261
 Firestarter, 125

- configuring
 - overview, 132–133
 - setting inbound rules, 133–134
 - setting outbound rules, 134–135
 - turning off diagnostic services, 135–136
- installing, 131–132

firewalls, 131. *See also* Firestarter
 FLAC audio file format, 286
 flagging e-mail messages, 387–388
 flags command-line, 214
 Flash, 167, 363, 370

- flash animations, 297–299
- Flash file, exporting Impress presentation as, 370–371
- Flash Player software, 170, 297
- flatbed scanners, 114
- flavors of Linux, 16
- Flip tool, GIMP, 304
- floating palettes, OpenOffice.org, 329
- floating toolbar, OpenOffice.org, 340
- floppy disk drive, 196
- floppy disks, formatting, 198
- Floppy Formatter, 176–177
- floppy system group, 440
- flow charts, 320
- FluxBox desktop interface, 540
- folders
 - in Evolution’s Mail mode, creating, 390–391
 - search folders, in Evolution, 394
- font preferences, 144–145
- Font Preferences dialog box, 144
- Font Rendering heading, Font Preferences dialog box, 144
- font-copying maneuver, 324
- fonts
 - copying Windows fonts, 323–325
 - installing TrueType Core Fonts, 324–326
 - overview, 323
- Fonts option, OpenOffice.org, 335
- Fontwork Gallery dialog box, 368
- Fontwork tool, 367–368
- Foomatic D1000 scanner, 534
- footers, in Writer, 352–353
- foreground (top) color box, 305
- Form Control toolbar, Base, 378, 380
- Form Navigation toolbar, Base, 381
- Form Wizard, Base, 377
- Format category, OpenOffice.org, 332
- Format Cell dialog box, Calc, 356
- formatting
 - data, in Calc, 355–356
 - floppies, 198
 - text, in Writer
 - context menu, 344
 - Formatting toolbar, 343
 - overview, 343
 - Style and Formatting palette, 345
- Formatting Aids option, OpenOffice.org Writer, 336–337
- Formatting toolbar
 - Calc, 355
 - Fontwork tool, 368
 - OpenOffice.org, 329
 - Writer, 343–344
- formatting tools, Writer, 164
- forms, Base, 167, 374
- Formula bar, Calc, 357
- formulas, Calc
 - overview, 356–357
 - summing figures, 358
 - using Function Wizard, 357
- forums, 533–534
- forward slash (/), 183, 530
- .4 command, vi command mode, 246
- FQDN (fully qualified domain name), 480
- Frame category, OpenOffice.org, 332
- framebuffer mode, 49, 55
- free command, 520
- Free Software Foundation (FSF), 13
- freeing disk space, 458
- fsck * command, 520
- FSF (Free Software Foundation), 13
- fstab configuration file, 232
- ftp * command, 520
- ftp program, 484
- full-screen option, 207
- fully qualified domain name (FQDN), 480

Function Wizard, Calc, 356–358
 functions, adding to toolbars,
 OpenOffice.org, 330–333
 fuser command, 520

G

g switch, 440
 G switch, 441
 Gaim, 105
 Gaim Internet messenger, 178
 GCC (GNU Compiler Collection), 14, 430
 GCompris, 538
 gcrontab program, 475
 gdm service, 449
 Gedit text editor, 119, 211, 445
 GeForce cards, 117
 General option
 Calc, 337
 Draw, 338
 Impress, 338
 Writer, 336
 General tab, GNOME Display Manager, 149
 Generic filters, GIMP, 313
 Geometry option, 3D effect, 369
 get command, sftp, 484
 GID (group ID), 439
 GIDs, 437
 GIMP (image editing program), 174–175
 cropping and cloning, 309–310
 filters, 311–315
 making color corrections, 308–309
 overview, 302–306, 308
 sharpening, 310–311
 Glass Effects filters, GIMP, 313
 glib libraries, GTK+ 1.2, 432
 Global Regular Expression Print, 251
 Globespan chipset, 92
 GNOME Art web site, 142–143
 GNOME CD/DVD Creator, 464
 GNOME desktop, running remotely, 486–487
 GNOME Display Manager, 149
 GNOME Onscreen Keyboard (GOK), 150
 GNOME Terminal, 94, 102, 119, 152, 207, 221,
 264, 270, 293, 447
 GNOME themes, 140
 gnome-app-install package, 424
 GnomeMeeting, 180
 gnome-session process, 487
 Gnopernicus, 150
 GNU and Linux together, 15–16
 GNU C Library, 416
 GNU Compiler Collection (GCC), 14, 430
 GNU organization, 5
 GNU project, 13–14
 GNU Public License (GPL), 14–15, 90
 Gnumeric, 326
 Go Back option, 39
 gocr program, 114
 GOK (GNOME Onscreen Keyboard), 150
 Google Summer of Code sponsorship
 scheme, 464
 GPL (GNU Public License), 14–15, 90
 Gradient fill tool, GIMP, 305
 Graphic category, OpenOffice.org, 332
 graphical boot process, 44, 51
 graphical problems
 graphics card configuration, 54–55
 keyboard and mouse configuration, 55–57
 monitor configuration, 57–59
 overview, 53–54
 graphical subsystem, 259
 graphical user interface. *See* GUI
 graphics. *See* image editing
 grep command, 274, 520
 Grid option
 Calc, 337
 Draw, 338
 Impress, 338
 Writer, 336–337
 group ID (GID), 439

- groupadd command, 440, 520
 - groupdel command, 441, 520
 - groups, creating and deleting via GUI, 439
 - groups command, 520
 - Groups tab, Users and Groups program window, 439
 - GRUB boot loader, 42–43, 443
 - GRUB boot menu, 52
 - GRUB> command prompt, 52
 - gststreamer packages, 281
 - GSynaptics, 102
 - gThumb software, 113, 301
 - GTK+ Greeter tab, GNOME Display Manager, 149
 - gtk2-engines search term, 142
 - GUI (graphical user interface), 16
 - adding and deleting users via, 437–439
 - creating and deleting groups via, 439
 - GUI applications, accessing remotely
 - accessing Ubuntu via Remote Desktop, 488–489
 - overview, 485
 - running GNOME desktop, 486–487
 - running X applications on remote computer, 485–486
 - GUI terminal emulator, 270
 - gzip command, 520
 - gzip program, 469
- H**
- h command option, 237
 - hackers, 127
 - halt command, 520
 - halt service, 449
 - Hancom Office, 326
 - Hand-drawn selection tool, GIMP, 303
 - Happy GNOME with Browser option, 151
 - hard disk
 - erasing, 39
 - settings, optimizing
 - benchmarking hard disk, 452–453
 - changing disk settings, 453–455
 - making disk optimizations permanent, 455–456
 - overview, 452
 - space, freeing up, 28
 - spinning down, 158–159
 - hardware
 - overview, 77–78
 - proprietary vs. open-source drivers, 78–79
 - viewing, 79–81
 - hash (#), 208
 - hdparm command string, 455, 521
 - hdparm service, 449, 452
 - hdparm settings, 455
 - head command, 242–243, 521
 - head mytextfile command, 242
 - headers, Writer, 352–353
 - help
 - online
 - forums, 533–534
 - mailing lists, 534–535
 - other official sites, 535
 - overview, 533
 - third-party sites, 535
 - in OpenOffice.org, 339
 - overview, 529
 - via manual
 - info pages, 532
 - man pages, 529–532
 - overview, 529
 - README files and other documentation, 533
 - Help Agent, 339
 - help command option, 268
 - help command, BASH, 521
 - help command, sftp, 485
 - :help command, vi command-line mode, 248
 - help option, 209
 - hexadecimal (hex) keys, 86

- hidden files and directories, 190
- hierarchical file system, 228
- high-resolution mouse, 146
- history command, 521
- history of Linux, 11–13
- /home directory, 127, 222, 228, 230, 233, 463
- /home/ folder, 466
- Home Folder option, 148
- host command, 521
- hostname
 - command, 521
 - setting, 37
- hotkey-se, 449
- hotplug service, 449
- hotplug-n, 450
- HowStuffWorks site, 92
- HP JetDirect, 109
- hplip service, 450
- HTML file types, 191
- Hue/Saturation option, GIMP, 308
- Hurd, 16
- hyperlinks, 532
-
- i command option, grep, 251
- i command, vi command mode, 246
- .i386.deb file extensions, 426
- icon selection dialog box, 284
- icons, 141
 - for files and folders, 188–189
 - Ubuntu desktop, 68
- id command, 440, 521
- IDE1 slave (hdb), 39
- ifconfig command, 209, 521
- ifrename service, 450
- ifupdown service, 450
- Illumination option, 3D effect, 369
- ILS (Internet Locator Service) directory, 180
- image editing
 - getting pictures onto PC, 301
 - GIMP
 - cropping and cloning, 309–310
 - filters, applying, 311–315
 - making color corrections, 308–309
 - overview, 302–308
 - sharpening, 310–311
 - overview, 301
- image editor programs, 162
- Image file types, 191
- Image-Editing Tools, GIMP, 303
- image-tweaking tools, Writer, 346
- IMAP mail servers, 103
- Impress (presentation program), 166–167
 - animating slides, 366–367
 - applying Fontwork, 367–368
 - creating quick presentation, 363–364
 - exporting presentation as Flash file, 370–371
 - overview, 363
 - using 3D effects, 369–370
 - working in, 365–366
- inbound data connection, 132
- inbound traffic policy, 133–134
- Include Threads drop-down box, Evolution, 394
- incremental backup, 466
- industrial-strength operating system, 7
- info command, 521
- info pages, 532
- init command, 521
- initialization and run-level services, optimizing
 - disabling run-level scripts, 447–451
 - overview, 446–447
 - repairing problems, 451–452
- initialization scripts, 444
- initrd.img -> boot/initrd.img-2.6.12-9-386 directory, 230
- Ink tool, GIMP, 305

- input devices, personalizing
 - keyboard settings, 147–148
 - mouse options, 146–147
 - overview, 146
- input/output (I/O) mode, 454
- Insert category, OpenOffice.org, 332
- Insert mode, vi text editor, 246–247
- inserting data and cells, in Calc, 356
- Install Theme button, Theme Preferences dialog box, 143
- installing
 - compiler tools, 430–431
 - Firestarter, 131–132
 - GRUB boot loader, 42–43
 - Microsoft Office, 406–407
 - problems with, 47–51, 413. *See also*
 - graphical problems; postinstallation problems; preinstallation problems
 - RealPlayer, 293
 - theme components
 - downloading from GNOME Art web site, 142–143
 - downloading from
 - Ubuntu repositories, 142
 - overview, 142
 - TrueType Core Fonts, 324–326
 - Ubuntu (overview), 33–34
 - Ubuntu (steps in order)
 - step 1-- booting from CD-ROM, 34–35
 - step 2-- selecting language, 36
 - step 3-- confirming keyboard layout, 36
 - step 4-- waiting during hardware and networking autodiscovery, 37
 - step 5-- setting hostname, 37
 - step 6-- partitioning disk, 38–40
 - step 7-- waiting during automated package copying, 40–41
 - step 8-- setting time zone, 41
 - step 9-- setting real name, username, and password, 41–42
 - step 10-- installing GRUB boot loader, 42–43
 - step 11-- rebooting for second installation phase, 43
 - step 12-- waiting during package installation, 44
 - step 13-- configuring monitor, 44–45
 - step 14-- booting for first time, 45–46
- installing software, 129
 - APT and package repositories
 - categories of repositories, 418–419
 - overview, 417–418
 - repository sections, 419–420
 - dependency management, 416–417
 - formats of Linux installation files, 414–415
 - overview, 413
 - package management from
 - command prompt
 - overview, 424
 - using APT tools, 426–430
 - using dpkg, 424–426
 - packages, 415–416
 - from source
 - compiling, 432–434
 - installing compiler tools, 430–431
 - overview, 430
 - unpacking tarball and solving dependencies, 431–432
 - Synaptic Package Manager
 - installing software, 422–423
 - overview, 420
 - removing software, 424
 - searching for software, 420–422
- instant messaging, setting up, 105–106
- Internet
 - configuring dial-up access, 90–92
 - overview, 81
 - USB-based DSL modem
 - Alcatel SpeedTouch series modem setup, 95–98
 - BT Voyager modem setup, 93–95
 - overview, 92

- using Ethernet card
 - configuring Network Card via DHCP, 82
 - configuring static IP address, 82–83
 - overview, 81
 - wireless networks
 - configuring WEP, 86
 - configuring wireless card, 84–85
 - configuring WPA, 87–90
 - overview, 84
 - using WEP or WPA encryption, 85–86
 - working with proxy server, 98–99
 - Internet Explorer favorites, 30
 - Internet Locator Service (ILS) directory, 180
 - IO_support setting, 454
 - IP address, 82–83
 - iptables, 125
 - ISO file, 50
 - ISP login, 97
- J**
- j option, 470
 - Java option, OpenOffice.org, 335
 - Java Runtime program, 299
 - jfs file system, 231
 - jobs, controlling, 264–265
 - jobs command, 521
 - junk e-mail, 391
 - junk mail filtering, Evolution, 391
- K**
- K Desktop Environment project (KDE), 537
 - keepsettings setting, 455
 - kernel, 4, 12, 443
 - kernel files, 77
 - Kernel Panic errors, 48
 - kernel program, 6
 - kernel-tree, 458
 - key combination, 148
 - keyboard
 - configuration, 55–57
 - layout, 36, 56
 - settings, 147–148
 - shortcuts, 148
 - in BASH, 269
 - overview, 269
 - for system control, 270–271
 - for working in BASH, 269–270
 - using Bluetooth keyboard, 122–123
 - Keyboard Preferences dialog box, 147
 - keyboard-based navigation system, 36
 - kill command, 521
 - killall command, 263, 521
 - klogd service, 450
 - KMail program, KDE, 537
 - Knoppix, 29
 - KOffice, 326
 - Konqueror, 423
 - Kubuntu, 537
 - kubuntu-desktop package, 537
 - KVM switch, 50
- L**
- l option, 221
 - LAMP acronym, 20
 - language, selecting, 36
 - Languages settings, 336
 - last command, 521
 - launchers, 152
 - launching files and running programs, 190–191
 - layers, GIMP, 307
 - Layout Options tab, Keyboard Preferences dialog box, 147
 - LAYOUTS tab, Keyboard Preferences dialog box, 147
 - lcd command, sftp, 484
 - ldd command, 521
 - learning to use Linux, 19–20

- left angle bracket (<), 254
 - Left/right cursor key shortcut, BASH, 269
 - less command, 242, 522
 - lib directory, 230
 - libglib package, 432
 - libgtk package, 432
 - libraries, 203, 456
 - Light Effects filters, GIMP, 313
 - Linmodems, 90
 - Linux
 - age of, 5–6
 - benefits of, 8–9
 - flavors of, 16
 - learning to use, 19–20
 - obtaining, 21
 - what it is, 3–5
 - who uses, 20
 - Linux kernel, 219
 - Linux swap-ins, 19
 - linux-res, 450
 - listing files, BASH shell, 213–214
 - live distros, 540
 - lls command, sftp, 484
 - mkdir command, sftp, 484
 - ln command, 522
 - local printer, 107–108
 - locate command, 236–237
 - Location bar, Nautilus window, 187
 - logging in, 64–65
 - logging in to remote computer, 480–482
 - login options, 149–150
 - login picture, 151
 - long option (-l), 214
 - lost+found directory, 230
 - lpadmin system group, 441
 - lpr command, 522
 - lpstat command, 522
 - ls command options, 214, 522
 - ls command, sftp, 484
 - ls -l command option, 223, 237
 - lsof command, 522
 - lsmod command, 522
 - lvm service, 450
- ## M
- m command option, 439
 - m hdparm command option, 454
 - Macromedia Flash, 167, 363, 370
 - macros, recording, OpenOffice.org, 340
 - Magnifier, 150
 - Mail Merge E-Mail option, OpenOffice.org Writer, 337
 - Mail Merge Wizard, Writer, 349
 - mail merging, Writer, 349–352
 - Mail mode, Evolution, 384
 - composing messages, 388
 - creating e-mail signature, 389–390
 - creating new folders, 390–391
 - creating search folders, 394
 - deleting messages, 386–387
 - flagging messages, 387–388
 - junk e-mail, 391
 - overview, 390
 - reading e-mail, 386
 - sending and receiving e-mail, 385–386
 - sorting and filtering messages, 392–393
 - Mail Preferences icon, Preferences dialog box, Evolution, 386
 - mailbox (.mbox) files, Thunderbird's, 388
 - mailing lists, 534–535
 - Main Distribution repository, 418
 - Main section, 419
 - main toolbar window, GIMP, 302
 - Main work area, 365
 - MainActor application, 299
 - make command, 433
 - make install command, 433
 - Make Link option, 153

- makedev service, 450
- makefile command, 433
- man command, 522
- managing users. *See* users, managing
- manual
 - info pages, 532
 - man pages, 529–532
 - overview, 529
 - README files and other documentation, 533
- Manual backups mode, 466
- Map filters, GIMP, 314
- Mark for Complete Removal option, 424
- Mark for Removal option, 424
- Mark Recommended for Installation option, 422
- Mark Suggested for Installation option, 422
- Massachusetts Institute of Technology (MIT), 14
- Material option, 3D effect, 369
- Max Size tab, 466
- MCU (Multipoint Control Unit), 180
- md5sum command, 522
- mdadm service, 450
- mdadm-raid service, 450
- Measurer tool, GIMP, 304
- media directory, 230
- membership to Linux community, 9
- memory cards, 301
- Memory option, OpenOffice.org, 335
- memory stick, USB, 116
- Menu bar
 - Nautilus window, 186
 - OpenOffice.org, 329
- menus
 - adding all menus to Panel, 154
 - adding Applications menu to Panel, 154–155
 - customizing, in OpenOffice.org, 333–334
 - deleting, 155
 - overview, 154
- Menu element, 68
- metapackages, 423
- Microsoft, 3
- Microsoft Access, 167
- Microsoft Exchange, 103
- Microsoft Office
 - running under Ubuntu
 - installing Office, 406–407
 - installing other Windows programs, 409
 - overview, 401
 - running Office components, 407–409
 - Wine, 401–406
 - similarities with OpenOffice.org, 319–320
- middle mouse button, 74
- Mines, 179
- Minix, 11
- Mist theme, 140
- MIT (Massachusetts Institute of Technology), 14
- MIT Artificial Intelligence Lab, 15
- mkdir command, 217, 484
- mkfs * command, 522
- mkisofs command, 471, 523, 532
- /mnt directory, 230, 233
- /mntI/windows directory, 234
- Modem Port drop-down list, 91
- modems, USB-based DSL
 - Alcatel SpeedTouch series modem setup, 95–98
 - BT Voyager modem setup, 93–95
 - overview, 92
- modern Linux development, 17
- Modify category, OpenOffice.org, 332
- modinfo command, 523
- modprobe command, 523
- module-in, 450
- monitor configuration, 44–45, 57–59
- monitor resolutions, 59
- monitor shutoff, controlling, 157–158
- more command, 241, 523

- Motion path option, Add button dialog box, 366
 - Motion Picture Association of America (MPAA), 296
 - Motion tab, Mouse Preferences dialog box, 146
 - mount command, 220, 523
 - mount point, 194
 - mounting, 183
 - drive, manually, 233–234
 - overview, 232
 - removing mounted system, 234–235
 - using mount command, 232
 - mountvirt, 450
 - mouse, 73–74
 - Bluetooth, 122–123
 - configuration, 55–57
 - options, 146–147
 - Mouse Preferences dialog box, 146
 - Move tool, GIMP, 304
 - movie playback programs, 172–173
 - movie/DVD players, 162
 - movie-editing software, Linux, 299
 - moving files, BASH shell, 215–216
 - Mozilla Foundation, 30
 - Mozilla Plug-in option, OpenOffice.org, 338
 - Mozilla Thunderbird e-mail client, 30
 - MP3 audio file format, 286
 - MP3 players, 162
 - MP3 support, adding to Sound Juicer, 286–287
 - MPAA (Motion Picture Association of America), 296
 - ms-dos prompt, 162
 - multcount setting, 454
 - multimedia
 - DVDs, 296–297
 - flash animations, 297–299
 - overview, 291
 - TV
 - checking for video input, 299
 - installing tvtime, 300
 - overview, 299
 - videos
 - installing codecs, 292
 - installing RealPlayer, 293
 - overview, 291–292
 - playing back video, 293–295
 - multimedia files, 30
 - Multimedia Systems Selector, 299
 - multiple virtual desktops, 139
 - multiple-speaker surround sound, 123
 - Multipoint Control Unit (MCU), 180
 - Multiverse section, 420
 - music. *See* digital music
 - mutt e-mail program, 422
 - mv command, 215, 523
 - My Computer function, Windows, 70
 - My Documents function, Windows, 70
 - My Network Places, 195
 - My Network Places/Network Neighborhood function, Windows, 70
- N**
- n command option, 242
 - N command, vi command mode, 246
 - n command, vi command mode, 246
 - name, setting, 41–42
 - Name heading, man page, 530
 - nano command-line text editor, 451
 - nano text editor, GNU, 474
 - Nautilus file browser, 112, 116, 140, 163, 173, 294, 463
 - file and folder icons, 188–189
 - overview, 186–188
 - special windows, 189–190
 - Navigate category, OpenOffice.org, 332
 - ndd command, vi command mode, 245

NdisWrapper, 90
 netstat * command, 523
 network cards, configuring via DHCP, 82
 Network Name (ESSID) drop-down list, 89
 Network Name (ESSID) field, 84
 Network Neighborhood, 195
 network printer configuration, 108–109
 Network Settings applet, 86, 95, 98
 networked files, accessing, 195–196
 networking service, 450
 New button, Evolution, 168
 New button, Synaptic Package Manager toolbar, 421
 New Panel option, 156
 newbies, 9
 Next Record button, 381
 Next Track button, 283
 NI column, top program, 259
 nice command, 524
 nohup command, 524
 Noise filters, GIMP, 312
 Nokia 6680 mobile phone, 119
 Notes heading, man page, 531
 Notification area, Ubuntu desktop, 68
 ntpdate service, 450
 nUbuntu, 540
 Numbering category, OpenOffice.org, 332
 Nvidia 3D cards, 116
 Nvidia driver, installing, 117–118
 nyy command, vi command mode, 246

0

O command, vi command mode, 246
 o command, vi command mode, 246
 o option, 532
 object modes, Nautilus, 189
 obtaining Linux, 21
 ODF (OpenDocument Format), 323, 341
 Office, Microsoft. *See* Microsoft Office
 Office file format, 321
 Office files, 30
 official sites, 535
 Ogg media format, 280
 Ogg Theora, 295
 Ogg Vorbis audio file format, 286
 one-off tasks, 477–478
 online help

- forums, 533–534
- mailing lists, 534–535
- other official sites, 535
- overview, 533
- third-party sites, 535

 online software repositories, 99–102
 online system upgrade, 52
 online updates, 130–131
 OpenDocument Format (ODF), 323, 341
 OpenOffice.org, 373. *See also* Base; Calc; Spreadsheet; Writer

- configuration options, 335
- creating macros, 340
- customizing interface
 - adding functions to toolbars, 330–333
 - adding new toolbar, 333
 - configuring options, 334–338
 - customizing menus, 333–334
 - overview, 330
- file compatibility, 321–323
- fonts
 - copying Windows fonts, 323–325
 - installing TrueType Core Fonts, 324–326
 - overview, 323
- getting help, 339
- inserting objects with Object Linking and Embedding, 339
- interface, 329–330
- key features, 320
- overview, 319, 329
- saving files, 341
- similarities with Microsoft Office, 319–320

- toolbar, customization categories, 332
- using wizards, 339
- OpenOffice.org Basic, 165
- OpenOffice.org BASIC Macros category, 332
- open-source software, 322
- open-source vs. proprietary drivers, 78–79
- Opera, 163
- operating system, defined, 4
- opt directory, 230
- Optimal Page Wrap, Writer, 347
- optimization
 - adding another disk drive
 - configuring Ubuntu to use drive, 461
 - overview, 460
 - partitioning disk, 460–461
 - booting
 - initialization and run-level services, 446–452
 - overview, 443–445
 - reducing boot menu delay, 445
 - freeing disk space
 - emptying cache of package files, 459–460
 - emptying /tmp folder, 458–459
 - overview, 458
 - removing unused software, 460
 - hard disk settings
 - benchmarking hard disk, 452–453
 - changing, 453–455
 - making disk optimizations permanent, 455–456
 - overview, 452
 - overview, 443
 - prelinking
 - configuring prelinking, 457
 - deactivating prelinking, 457–458
 - overview, 456–457
- options, configuring, in OpenOffice.org, 334–338

- Options category, OpenOffice.org, 332
- Options configuration dialog box, Writer, 352
- Options heading, man page, 531
- Optra, 107
- outbound traffic, 133
- outgoing connections, 134

P

- p command, vi command mode, 246
- package conflict resolution, 417
- package files, 414, 459–460
- package management from command prompt
 - overview, 424
 - using APT tools
 - installing and removing packages, 427–428
 - overview, 426–427
 - querying packages and repositories, 429–430
 - updating system, 428
 - using dpkg
 - installing packages, 424–425
 - overview, 424
 - querying packages, 426
 - uninstalling packages, 426
- package manager, 414
- package repositories. *See also* APT and package repositories
- package version, 281
- package-manipulation command, 424
- packages, 415–416
- packaging, overview, 413
- Paired Devices, 119
- panel, Ubuntu desktop, 68
- Panel entry, GIMP, 302
- panels, personalizing, 156
- Paragraph dialog box, Writer, 344
- parent directory, 217
- parent processes, 261

- partitioning, 25–27, 460–461
 - deleting Windows partition, 39
 - overview, 38
 - sharing hard disk with Windows, 38–39
 - using existing free space, 40
 - working with files in Windows partitions, 192–195
- passphrase, 86
- passwd command, 441, 524
- passwords, 128
 - adding and changing, 441–442
 - setting, 41–42
- pasting. *See* cutting and pasting text
- patents, software, 279
- Path creation tool, GIMP, 304
- Path field, 284
- PATH variable, 208
- paths, GIMP, 306
- Paths option, OpenOffice.org, 335
- Paths tab, 466
- Pattern stamp tool, GIMP, 305
- pax command, 468
- PCMCIA cards, 84, 102
- pcmcia service, 450
- PDF (Portable Document Format), 191, 320, 341
- PDKSH (Public Domain Korn SHell), 204
- Pencil tool, GIMP, 305
- period (.), 235, 463
- permissions. *See also* users and file permissions
- Permissions tab, 195
- permissive policy, 133
- personal ID number (PIN), 119
- personal information management program. *See* Evolution
- personalization
 - desktop items
 - applets, 156
 - menus, 154–155
 - overview, 152
 - personalizing panels, 156
 - shortcuts, adding, 152–154
- font preferences, 144–145
- input devices
 - keyboard settings, 147–148
 - mouse options, 146–147
 - overview, 146
- keyboard shortcuts, 148
- login options, 149–150
- login picture, 151
- overview, 139
- power-saving features
 - controlling monitor shutoff, 157–158
 - overview, 157
 - spinning down hard disk, 158–159
- theme
 - changing individual theme
 - components, 141–142
 - installing additional components, 142–143
 - overview, 139–140
 - wallpaper, 143–144
- Perspective tool, GIMP, 304
- Phone List view, Contacts mode, Evolution, 394
- photo editing program. *See* GIMP
- photos, transferring from digital camera
 - overview, 111
 - using camera's cable connection, 113
 - using card reader, 111–113
- Photoshop 6, 409
- pictures. *See also* image editing
 - inserting, in Writer, 346–347
- PID column, top program, 258
- PID number, 261
- PIN (personal ID number), 119
- ping command, 524
- pipe symbol (|), 254

- pipng and directing output
 - of commands, 272–274
 - overview, 272
 - redirecting output, 274–275
- Places menu, 67
- Places pane, Nautilus window, 188
- plain text (passphrase) keys, 86
- plugdev system group, 441
- POP3 mail servers, 103
- Portable Document Format (PDF), 191, 320, 341
- postinstallation problems, 51–53
- Power Management box, 158
- powernowd service, 450
- PowerPoint, 166–167
- power-saving features, 49
 - controlling monitor shutoff, 157–158
 - overview, 157
 - spinning down hard disk, 158–159
- ppp service, 450
- pppd-dns service, 450
- PPPoA technical standard, 95
- PPPoE technical standard, 95
- PR column, top program, 258
- precompiled kernels, 458
- preinstallation problems, 47–49
- prelink command, 457
- prelinking, 456
 - configuring, 457
 - deactivating, 457–458
 - overview, 456–457
- prelinking scan, 457
- Presentation file types, 191
- presentation programs. *See* Impress
- Presentation Wizard, 167, 363
- primary key, Base, 379
- Print option
 - Calc, 337
 - Draw, 338
 - Impress, 338
 - Writer, 336–337
- Print Scr button, 32
- printenv command, 524
- printers
 - local printer configuration, 107–108
 - network printer configuration, 108–109
 - overview, 107
 - Windows/SMB shared printer configuration, 109–111
- proc directory, 230
- processes
 - controlling
 - killing processes, 260–262
 - overview, 260
 - using other commands for, 263–264
 - Zombie processes, 262–263
 - viewing, 257–260
- process-killing command, 263
- program window, Evolution, 383
- programs, 540. *See also* names of specific programs
 - audio playback, 171–172
 - CD/DVD burning, 173
 - database, 167
 - e-mail/personal information management, 168–169
 - movie playback, 172–173
 - overview, 161, 163, 175
 - photo editing, 174–175
 - presentation, 166–167
 - running, 71–72, 190–191
 - spreadsheet, 165–166
 - web browsing, 169–170
 - word processing, 163–164

Properties option, context menu, 188
 proprietary software, and GPL, 14–15
 proprietary vs. open-source drivers, 78–79
 Proxy option, OpenOffice.org, 338
 proxy servers, 98–99
 ps command, 263, 524
 Public Domain Korn SHell (PDKSH), 204
 put command, sftp, 485
 pwd command, sftp, 485, 524

Q

:q command, vi command-line mode, 248
 :q! command, vi command-line mode, 248
 queries, Database pane, Base, 375
 question mark (?), 242
 Quick Launch toolbar function, Windows, 70
 QuickTime format, 292

R

r command option, grep command, 251
 r command-line option, 215
 radio stations, online, 284
 RawWrite program, 47
 RDP (Remote Desktop Protocol), 489
 readahead service, 450, 455
 README files, 242, 533
 readonly setting, 455
 Real Video format, 292
 RealAudio streams, 284
 RealPlayer, 293
 reboot command, 524
 reboot service, 451
 receiving e-mail, 385–386
 Recommended backup mode, 465
 recording macros, OpenOffice.org, 340
 recovery mode, 53
 Rectangular selection tool, GIMP, 303
 Recurrence tab, Evolution, 397
 Recycle Bin function, Windows, 70
 redirecting output, 274–275

Regex tab, 466
 regexes, 252
 reiserfs file system, 231
 Reload button, 190, 420
 Remember Password box, Evolution, 385
 remote access to computers

- accessing GUI applications remotely
 - accessing Ubuntu via Remote Desktop, 488–489
 - overview, 485
 - running GNOME desktop, 486–487
 - running X applications on remote computer, 485–486
- connecting to remote Windows computers
 - other Windows computers, 491–492
 - overview, 489
 - Windows XP Professional, 2000, and NT, 489–491
- overview, 479
- using secure shell
 - logging in to remote computer, 480–482
 - overview, 479–480
 - transferring files between remote computers, 483–485

- Remote Desktop, 488–489, 491
- Remote Desktop Protocol (RDP), 489
- remote shell session, 482
- Remote tab, 490
- removable storage devices
- ejecting media from drives, 197–198
- formatting floppies, 198
- overview, 196–197
- removing
- unused software, 460
- Windows, 28
- Render filters, GIMP, 314
- renice command, 524
- renice value, 260
- renicing, 260

- repartitioning hard disks, 29
 - Reply button, Evolution, 168
 - Reply To All button, Evolution, 168
 - reports, Database pane, Base, 375
 - RES column, top program, 259
 - resizing windows, 74
 - resolution, 67
 - Restore As button, 468
 - restoring data, via SBackup, 468
 - Restricted section, 419
 - restrictive policy, 133
 - reverse dependencies, 417, 426
 - Rhythmbox (audio playback program), 171–172, 280, 282–283
 - Rich Text Format (RTF), 241, 321
 - right angle bracket (>), 254
 - ripping music from CDs
 - adding MP3 support to Sound Juicer, 286–287
 - choosing format, 285–286
 - overview, 285
 - process, 287–288
 - rm command, 216, 485, 525
 - rmdir command, sftp, 485
 - rmmmod command, 524
 - rmnologin service, 451
 - root and ordinary users, 126–128
 - root directory, 230, 268
 - root password, 436
 - root user, 436–437
 - root user account, 126
 - Rotate tool, GIMP, 304
 - route * command, 524
 - router address, 82
 - rsync service, 451
 - RTF (Rich Text Format), 241, 321
 - Ruler, OpenOffice.org, 329
 - run level, 211
 - runlevel command, 524
 - Runlevel Control, 451
 - run-level scripts, 443
 - run-level services. *See* initialization and run-level services, optimizing
 - running programs, 71–72, 190–191
 - rw- file permissions, 226
- S**
- S column, top program, 259
 - s command option, 237
 - S command option, 237
 - Sanskrit, 206
 - SATA hard disks, 50
 - Save As dialog box
 - OpenOffice.org, 341
 - Writer, 164
 - Save As drop-down list, OpenOffice.org, 341
 - saving backup file to CD-R/RW, 471
 - SBackup, 464
 - changing backup file destination, 467
 - changing time period between backups, 467–468
 - excluding files and folders, 466
 - including files and folders, 466
 - overview, 464–466
 - restoring data via, 468
 - sbin directory, 230
 - Scale tool, GIMP, 304
 - scaled option, Style drop-down list, 144
 - scanner system group, 441
 - scanners, configuring, 114–116
 - scheduling tasks
 - with anacron, 476–477
 - with crontab
 - creating scheduled task, 474–475
 - editing with GUI, 475
 - overview, 473
 - overview, 473
 - using at command to schedule one-off tasks, 477–478
 - scp, 483

- screen * command, 525
- screen program, 482
- screen-cl, 451
- Screenreader, 150
- screensavers, 118
- script, defined, 403
- Search button, Synaptic Package Manager toolbar, 421
- search folders, in Evolution, 394
- Search option, OpenOffice.org, 338
- searching for files
 - overview, 235
 - using find command, 235–236
 - using locate command, 236–237
 - using whereis command, 237
- /second_disk directory, 461
- secure shell, remote access to computers using
 - logging in to remote computer, 480–482
 - overview, 479–480
 - transferring files between remote computers, 483–485
- Secure Shell (SSH) tool, 132
- Secure Socket Layer (SSL), 86
- security, 8
 - common-sense security, 128–129
 - Firestarter
 - configuring, 132–136
 - installing, 131–132
 - online updates, 130–131
 - overview, 125
 - root and ordinary users, 126–128
 - Ubuntu firewall, 131. *See also* Firestarter
 - Windows security vs. Linux security, 125–127
- Security option, OpenOffice.org, 335
- Security tab, GNOME Display Manager, 149
- Security Updates repository, 419
- Select Custom Icon option, 188
- self-installing binaries, 414
- Self-Installing Package, Windows, 491
- sending e-mail, 385–386
- sendsigs service, 451
- Sensitivity setting, 146
- Serpentine (CD/DVD burning program), 173, 288
- service, 446, 448–451
- Services Settings program, 447
- sftp, 484–485, 525
- Shading option, 3D effect, 369
- Shape selection tool, GIMP, 304
- sharing Linux, 8
- Sharpen filter, GIMP, 310
- sharpening, in GIMP, 310–311
- Shear tool, GIMP, 304
- shell commands, 272
- shell scripting, 275
- Shockwave Director browser plug-in, 299
- shortcuts, adding
 - creating launchers, 152–153
 - creating links, 153–154
 - overview, 152
- shortcuts, keyboard. *See* keyboard, shortcuts
- Shoutcast tab, 284
- Show Desktop icon, 154
- Show Hide Buttons, 156
- SHR column, top program, 259
- shred command, 525
- shriek, 271
- Shutdown/Reboot function, Windows, 71
- Sidenet script, 403, 407
- Sidenet Wine Configuration Utility, 403
- signatures, e-mail, 389–390
- single service, 451
- slash (/), 242
- sleep command, 525
- sliders, GIMP, 308
- slides, animating, 366–367
- Slides pane, 365
- smbclient * command, 525

- Smudge tool, GIMP, 305
- software, removing, 460. *See also* installing software
- software download feature, Ubuntu, 324
- software patents, 279
- software toolkits, 126
- Software Updates window, 130
- Sophos antivirus labs, 126
- Sort By drop-down list, Calc, 359
- sort command, 275, 525
- Sort Lists option, OpenOffice.org Calc, 337
- sorting data, in Calc, 359
- sorting e-mail messages, 392–393
- Sound & Video submenu, 284
- sound cards, configuring, 123
- Sound Juicer, 286–287
- source code, 12, 414
- sources.list file, APT, 418
- space on hard drive. *See* hard disk, space, freeing up
- speed command option, 531
- spell-checking, in Writer, 345–346
- spin-down settings, 158
- spinning down hard disk, 158–159
- Spreadsheet file types, 191
- spreadsheet program. *See* Calc
- spreadsheets, 348
- square brackets, 252
- srv directory, 231
- SSH (Secure Shell) tool, 132
- ssh * command, 525
- ssh remote shell session, 480
- ssh server program, 480
- ssh suite, 479
- ssh-keygen program, 481
- SSID name, 89
- SSL (Secure Socket Layer), 86
- Stallman, Richard, 13–14
- standard error, 275
- standard input (stdin), 272, 275, 531
- standard output (stdout), 272, 275, 531
- Standard toolbar, OpenOffice.org, 329
- Star Office, 319
- Start menu function, Windows, 70
- starting up, 63–64
- startx command, 525
- static addresses, 31
- static IP address, 82–83
- status (S) column, 262
- Status bar, OpenOffice.org, 330
- stdin (standard input), 272, 275, 531
- stdout (standard output), 272, 275, 531
- stop-boot, 451
- storage, file, 184–186
- storage devices, removable
 - ejecting media from drives, 197–198
 - formatting floppies, 198
 - overview, 196–197
- storing backup data, 471
- Streamtuner, 284
- Style and Formatting palette, Writer, 345
- Stylus Color, 107
- su command, 525
- subdirectories, 185
- submenus, GIMP, 311
- subnet mask, 82
- sudo apt-get build-essential command, 431
- sudo apt-get dist-upgrade command-line, 428
- sudo apt-get update command, 428–429
- sudo command, 228, 437, 439, 525
- sudo passwd root command, 436
- sudo service, 451
- sudo system, 223
- Sum icon
 - Calc, 358
 - Writer, 348
- Summary field, Evolution, 397
- Sun Microsystems, 17, 319

- superusers, 126, 223
 - supplementary groups, 440
 - switches, command-line, 214
 - :s/word/replacement/ command, vi
 - command-line mode, 248
 - Synaptic Package Manager, 21, 88, 99, 116, 142, 281, 284, 298, 300, 324, 326, 447, 457, 465, 475, 480
 - installing software, 422–423
 - overview, 420
 - removing software, 424
 - searching for software, 420–422
 - Synaptics TouchPad, 102
 - Synopsis heading, man page, 530–531
 - sys directory, 231
 - sysklogd service, 451
 - system, controlling
 - controlling jobs, 264–265
 - controlling processes
 - controlling Zombie processes, 262–263
 - killing processes, 260–262
 - overview, 260
 - using other commands for, 263–264
 - overview, 257
 - viewing processes, 257–260
 - system control, keyboard shortcuts for, 270–271
 - system fonts, 144
 - system libraries, 5, 416
 - System menu, 67
 - System Restore, 28
 - system variable, 208
 - SysV Runlevel Config program, 447
- T**
- t command option, mount command, 234
 - t option, tar command, 470
 - Table category, OpenOffice.org, 332
 - Table option, Writer, 337
 - Table tool, Writer, 347
 - Table toolbar, Writer, 349
 - Table Wizard, Base, 375
 - tables
 - adding to databases, 375–377
 - Database pane, Base, 374
 - editing database table, 379–380
 - in Writer, 347–349
 - Tables option, OpenOffice.org Writer, 336
 - tac command, 525
 - tail command, 242–243, 525
 - tail mytextfile command, 242
 - Tanenbaum, Andrew, 12
 - tape system group, 441
 - tar archives
 - compressing, 469–470
 - extracting files from, 470
 - viewing information, 470
 - tar command, 477, 526
 - tar files, 468–469
 - tarball, unpacking, 431–432
 - .tar.gz archive, 143
 - task field, 477
 - Tasks, Evolution, 399
 - tasks, scheduling. *See* scheduling tasks
 - Tasks button, Evolution, 169
 - Tasks mode, Evolution, 385, 398–399
 - Tasks pane
 - Base, 374
 - Impress, 365
 - tee command, 526
 - templates, 363
 - Templates category, OpenOffice.org, 332
 - terminal emulator program, 207
 - terminal programs, 203
 - Terminal Server Client program, 489
 - Terminal window, GNOME, 102, 539
 - Texinfo system, 532
 - Text editor/viewer, 163

- text files
 - comparing, 254
 - overview, 241
 - searching through
 - overview, 251
 - using grep, 251–252
 - using regular expressions, 252–254
 - types, 191
- vi text editor
 - creating new text file using, 250–251
 - modes, 244–248
 - overview, 244
 - using to edit file, 248–250
- viewing
 - overview, 241
 - using cat command, 241
 - using head and tail commands, 242–243
 - using less command, 241–242
- Text Formatting toolbar, 167
- Text tool, GIMP, 304
- text-based shell, 204
- text-formatting tools, Writer, 164
- Textures option, 3D effect, 369
- Theme Details button, Theme Preferences dialog box, 141
- Theme Preferences dialog box, 140
- Themed Greeter tab, GNOME Display Manager, 149
- themes
 - changing individual components, 141–142
 - installing additional components
 - downloading from GNOME Art web site, 142–143
 - downloading from Ubuntu repositories, 142
 - overview, 142
 - overview, 139–140
- third-party partitioning tool, 40
- third-party sites, 535
- three dashes (---), 226
- three-button mouse, 57
- 3D effects, 369–370
- 3D flourish tool, 369
- 3D graphics card drivers, installing
 - ATI driver, 117
 - Nvidia driver, 117–118
 - overview, 116–117
 - testing 3D capabilities, 118
- Threshold setting, 146
- Thunderbird e-mail client, 30
- TightVNC system service, 491
- tilde (~), 474
- tiled option, Style drop-down list, 144
- Time bar, Totem Movie Player, 173, 294
- time zone, 41
- TIME+ column, top program, 259
- /tmp folder, 231, 458–459, 473
- Toolbar, Nautilus window, 186
- toolbars, in OpenOffice.org
 - adding functions to, 330–333
 - adding new toolbar, 333
- top * command, 526
- top program, 257
- Torvalds, Linus, 6, 11, 13
- Totem Movie Player, 172–173, 207, 291, 294
- touch command, 526
- Toys filters, GIMP, 315
- tpconfig utility, 102
- tracpath command, 526
- Track Editor button, 284
- transferring files
 - between Bluetooth devices
 - overview, 120
 - sending files from Ubuntu PC to another device, 121
 - sending files to Ubuntu PC, 120–121
 - photos from digital camera
 - overview, 111
 - using camera's cable connection, 113
 - using card reader, 111–113

- between remote computers
 - overview, 483
 - using scp, 483
 - using sftp, 484–485
 - Trash folder, Evolution, 387
 - TrueType Core Fonts, 323–326
 - TV
 - checking for video input, 299
 - installing tvtime, 300
 - overview, 299
 - TV card, 299
 - TWAIN modules, Windows, 301
 - Typing Break tab, Keyboard Preferences dialog box, 147
- U**
- u command, vi command mode, 246
 - Ubuntu blog, 535
 - Ubuntu Document Storage Facility, 535
 - Ubuntu Guide, 535
 - Ubuntu root file system, 230
 - Ubuntu Server, 538–539
 - ubuntu-desktop metapackage, 424
 - udev service, 451
 - udev-mtab service, 451
 - UIDs, 437
 - umask command, 526
 - umount command, 234, 526
 - umountfs service, 451
 - unalias command, 526
 - uname command, 526
 - undo command option, 457
 - Universe section, 419
 - Unix operating system, 7, 11, 17
 - unmaskirq setting, 454
 - Unmount Volume, 113, 198
 - unused software, removing, 460
 - unzip command, 264, 526
 - Update Manager icon, 130
 - updates, online, 130–131
 - Updates repository, 418
 - uppercase letters, 184
 - uptime command, 527
 - urandom service, 451
 - USB keyboard, 48
 - USB memory stick, 93, 116
 - USB socket, 219
 - USB-based DSL modems
 - Alcatel SpeedTouch series modem setup, 95–98
 - BT Voyager modem setup, 93–95
 - overview, 92
 - Use largest continuous free space option, 40
 - User Account Editor dialog box, 437
 - USER column, top program, 258
 - User Data option, OpenOffice.org, 335
 - User Privileges tab, 439
 - useradd command, 439, 441, 526
 - user-defined string, 274
 - userdel command, 441, 526
 - username, setting, 41–42
 - Username box, 195
 - users, managing
 - adding and changing passwords, 441–442
 - adding and deleting groups at command line, 439–441
 - adding and deleting users
 - at command line, 439–441
 - via GUI, 437–439
 - creating and deleting groups via GUI, 439
 - overview, 435
 - user and group accounts
 - overview, 435
 - root user, 436–437
 - UIDs and GIDs, 437
 - users and groups, 435–436
 - users and file permissions
 - altering permissions, 227–228
 - overview, 221–223

- viewing permissions
 - overview, 223–225
 - permissions on directory owned by root, 226–227
 - permissions on user's directory, 226
 - typical data file permissions, 225–226
- Users tab, GNOME Display Manager, 150
- user-scheduled tasks, 473
- Using_Dma setting, 455
- usplash service, 451
- usr directory, 231
- /usr/share/doc directory, 533

V

- v option, 470
- var directory, 231
- /var/backup directory, 467
- variables, 208
- VBA (Visual Basic for Applications), 165, 321
- VBA compatibility, OpenOffice.org, 321
- vbesave service, 451
- vCard, Evolution, 396
- vector graphics creation tool, 320
- versions of Ubuntu
 - Edubuntu, 538
 - Kubuntu, 537
 - overview, 537
 - Ubuntu Server, 538–539
 - Xubuntu, 539–540
- vi * command, 527
- vi README command, 249
- vi text editor, 244
 - creating new text file using, 250–251
 - modes
 - Command mode, 245–246
 - Command-Line mode, 247–248
 - Insert mode, 246–247
 - overview, 244
 - overview, 244
 - using to edit file, 248–250

- video system group, 441
- videos
 - file types, 191
 - installing codecs, 292
 - installing RealPlayer, 293
 - overview, 291–292
 - playing back video, 293–295
- View As Icons/List, Nautilus window, 187
- View category, OpenOffice.org, 332
- View option
 - Calc, 337
 - Draw, 338
 - Impress, 338
 - Writer, 336–337
- VIRT column, top program, 259
- virtual desktops, 72–73, 139
- virtual files, 219–221
- Virtual Network Computing (VNC)
 - software, 488
- virtual PC software, 29
- viruses, 6, 126
- Visible Buttons entry, 330
- Visual Basic for Applications (VBA), 165, 321
- Vmlinuz -> boot/vmlinuz-2.6.12-0-386
 - directory, 231
- VMware, 7
- VNC (Virtual Network Computing) software, 488
- volume control applet, 123
- Voyager 205, 93
- vv option, 470

W

- w command, vi command mode, 246
- :w! command, vi command-line mode, 248
- :w command, vi command-line mode, 248
- wallpaper, personalizing, 143–144
- war driving, 85
- Wastebasket, 67, 155
- wc command, 527

- web browsers, 162, 169–170
- Web filters, GIMP, 314
- web page creation programs, 162
- web proxy, 98
- web server, 538
- websites, 535
- WEP (Wireless Equivalent Privacy), 85–86
- whatis command, 527
- whereis command, 237, 527
- widgets, 141
- Wi-Fi Protected Access (WPA), 85–90
- Winamp Lite audio software, 409
- Winamp media player, 413
- window borders, 141
- Window List, 154
- windows
 - Nautilus, special windows, 189–190
 - resizing, 74
- Windows computers, connecting to remotely
 - other Windows computers, 491–492
 - overview, 489
 - Windows XP Professional, 2000, and NT, 489–491
- Windows files, accessing
 - accessing networked files, 195–196
 - overview, 192
 - working with files in Windows partitions, 192–195
- Windows fonts, copying, 323–325
- Windows Media Player 9 format, 292
- Windows Start button, 154
- Windows XP Home machine, 324
- Windows operating system
 - deleting Windows partition, 39
 - problems with, 6–7
 - removing, 28
 - security of, vs. Linux security, 125–127
 - sharing hard disk with, 38–39
- Windows/SMB shared printer configuration, 109–111
- Wine
 - configuring, 403–406
 - downloading, 401–403
 - overview, 401
 - showing hidden files on CDs, 406
- .wine directory, 407
- WinZip archiving application, 409
- Wireless Connection, 84
- Wireless Equivalent Privacy (WEP), 85–86
- wireless networks
 - configuring WEP, 86
 - configuring wireless card, 84–85
 - configuring WPA, 87–90
 - overview, 84
 - using WEP or WPA encryption, 85–86
- wizard-based interface, 339
- wizards, in OpenOffice.org, 339
- word processing program. *See* Writer
- Word processor file types, 191
- Workspace Switcher tool, 72, 156
- worms, 6, 126
- WPA (Wi-Fi Protected Access), 85–90
- wpasupplicant software, 88
- write files, 193
- Writer (word processor), 163–164
 - adding headers and footers, 352–353
 - formatting text
 - context menu, 344
 - Formatting toolbar, 343
 - overview, 343
 - Style and Formatting palette, 345
 - inserting pictures, 346–347
 - mail merging, 349–352
 - overview, 343
 - spell-checking, 345–346
 - working with tables, 347–349
- Writer Options dialog box, 334
- Writing Aids settings, 336

X

- X command option, 455
- X flag, 485
- X graphical subsystem, 485
- x option, 470
- X server communications, 485
- x86-based processors, 430
- XDMCP tab, GNOME Display Manager, 149
- XFCE, 539
- xfst file system, 231
- xhost command, 527
- Ximian, 383
- xinit command, 527
- XMMS, configuring, 284
- X.org drivers, 116
- X.org graphical subsystem, 53
- xorg-comm, 451
- XSane utility, 114
- XServer tab, GNOME Display Manager, 149
- Xterm, 163
- xterm window, 487
- Xubuntu, 539
- XviD file format, 295

Y

- y option, 254
- yy command, vi command mode, 246

Z

- z command option, 470
- z option, 470
- zero (0) value, 445
- zip command, 527
- zip files, 162, 177
- zipgrep command, 527
- Zombie processes, 262–263
- Zoom controls, Nautilus window, 187
- Zoom tool, GIMP, 304, 306
- ZSH (Z SHell), 204