



Glossary

~ The tilde (~) represents the home directory of the current user.

Address Resolution Protocol (ARP) A protocol that maps an IP address to the hardware address on a network card.

anacron The **anacron** service, while not included with RHEL 3, is part of the RHCT prep course as of this writing (and is therefore required knowledge for RHCEs). It runs **cron** jobs that could not run while a server was powered down.

Apache Web server The Apache Web server provides both normal and secure Web services. Apache is controlled by the **httpd** daemon.

apachectl The **apachectl** command is the preferred method to start and stop an Apache server.

arp (Address Resolution Protocol) command The **arp** command is used to view or modify the kernel's ARP table. Using **arp**, you can detect problems such as duplicate addresses on the network. Alternatively, you can use **arp** to add the required entries from your LAN.

at The **at** command is similar to **cron**, but it allows you to run a job on a one-time basis.

authentication The way Linux checks the login rights of a user. Linux and Unix users are normally authenticated through use of a username and password, checked against **/etc/passwd** and related files.

Automounter The Automounter can be configured to mount local and network directories on an as-needed basis. It's configured in **/etc/auto.master** and **/etc/auto.misc**.

BIND (Berkeley Internet Name Domain) BIND is the Unix/Linux software that is used to set up a Domain Name System (DNS) service. The associated daemon is **named**.

/boot The directory with the main files required to boot Linux, including the Linux kernel and initial RAM disk. By default, **/boot** is mounted on a separate partition.

BOOTP A TCP/IP protocol that sends IP address information from a remote DHCP server.

caching-only name server A caching-only name server performs many of the functions of a DNS server. It stores the IP address associated with recent name searches, for use by other computers on your LAN.

chage The **chage** command manages the expiration date of a password.

chains Chains are **iptables** (or **ipchains**) commands that are linked together. These are linked rules that are applied to each network packet that passes through a Linux firewall computer. **iptables** is the standard for RHEL 3.

chgrp The **chgrp** command changes the group that owns a file.

chkconfig The **chkconfig** command manages runlevel service information. It can activate or deactivate services. It can also customize services at specific runlevels.

chmod The **chmod** command changes the permissions on a file.

chown The **chown** command changes ownership on a file.

CIFS (Common Internet File System) CIFS is the Microsoft name for advances in its networking software. It's also covered by the latest version of Samba, 3.0, which is included with RHEL 3.

client A client is a computer that accesses information or resources from a server.

CNAME (canonical name) The CNAME is a way to assign several different names to a computer in a DNS database. For example, you can set up **www** as an alias for the computer with your Web server. CNAME records cannot be assigned to a mail server (MX) or a Start of Authority (SOA) record.

cron A service which runs jobs on a periodic basis. It's configured in **/etc/crontab**; by default, it executes jobs in the **/etc/cron.hourly**, **/etc/cron.daily**, **/etc/cron.weekly**, and **/etc/cron.monthly** directories.

4 Glossary

crontab Individual users can run the **crontab** command to configure jobs that are run periodically.

CUPS (Common Unix Printing System) CUPS is the default print service for RHEL 3.

daemon A process such as the Web service (**httpd**) or X font server (**xfs**) that runs in the background and executes as required.

/dev The directory with device files, used to represent hardware and software components.

DHCP (Dynamic Host Configuration Protocol) DHCP clients lease IP addresses for a fixed period of time from a DHCP server on a local network. The BOOTP protocol allows DHCP clients to get IP address information from a remote DHCP server. The DHCP server daemon is **dhcpcd**; the DHCP client daemon is **dhclient**.

Disk Druid Anaconda's hard disk management program. While the functionality is similar to **fdisk**, it is easier to use. However, Disk Druid is available only during the Linux installation process.

display manager A Linux display manager includes a dialog box for your username and password. Three major display managers are used in RHEL 3: **gdm** (GNOME), **kdm** (KDE), and **xdm**.

dmesg The **dmesg** command lists the kernel ring buffer, the initial boot messages.

DNS (Domain Name System) This service maintains a database of domain names such as **www.redhat.com** and IP addresses such **206.132.41.202**. If the domain name is not in the local database, DNS is normally configured to look to other, more authoritative DNS servers. The associated daemon is **named**.

dumpe2fs The **dumpe2fs** command provides a lot of information about the format of a partition.

e2label The **e2label** command associates a device with a filesystem directory.

edquota The **edquota** command edits the quota for a user or a group.

emacs The emacs editor is a popular text editor, which can be run from a text console.

environment Each user's environment specifies default settings such as login prompts, terminals, the PATH, mail directories, and more.

/etc/fstab The **/etc/fstab** configuration file defines default mounted directories.

/etc/inittab The **/etc/inittab** configuration file sets the default runlevel and starts key processes such as terminal gettys.

/etc/X11/prefdm The **/etc/X11/prefdm** configuration file specifies the preferred GUI display manager.

exportfs The **exportfs** command allows shared NFS directories to be shared with a network.

fdisk A standard disk partition command utility, which allows you to modify the physical and logical disk partition layout.

Fedora Linux The successor to the freely available version of Red Hat Linux; more information on this Linux distribution is available online at fedora.redhat.com.

filesystem Filesystem has multiple meanings in Linux. It refers to mounted directories; the root directory (/) filesystem is formatted on its own partition. It refers to file formats; Linux partitions are typically formatted to the ext3 filesystem.

Filesystem Hierarchy Standard The official way to organize files in Unix and Linux directories. The top level directory is known as the root directory (/); users' home directories are configured in /home.

find The **find** command searches for a desired file through a given directory and its subdirectories.

fips The First Interactive Partition Splitter, **fips**, allows you to split existing VFAT partitions.

firewall A hardware or software system that prevents unauthorized access over a network. Normally used to protect a private LAN from attacks through the Internet.

firstboot The process that starts when you've configured RHEL 3 during installation to boot into the GUI (runlevel 5).

fsck The `fsck` command checks the filesystem on a Linux partition for consistency.

FTP (File Transfer Protocol) A TCP/IP protocol designed to optimize file transfer between computers.

gateway A route from a computer to another network. A default gateway address is the IP address of a computer or router that connects a LAN with another network such as the Internet.

getty A getty is a terminal program, which includes prompts for a login and a password. Virtual console gettys are configured through the `mingetty` program via `/etc/inittab`.

GNOME (GNU Network Object Model Environment) GNOME is the default GUI desktop for Red Hat Enterprise Linux.

GPG (GNU Privacy Guard) GPG is an implementation of the OpenPGP standard included with Red Hat Linux.

group ID Every Linux group has a group ID, as defined in `/etc/group`.

GRUB (Grand Unified Bootloader) The default boot loader for RHEL 3.

grub-install The `grub-install` command makes your BIOS look for your GRUB boot loader.

home directory The home directory is the login directory for Linux users. Normally, this is `/home/user`, where *user* is the user's login name. It's also represented by the tilde (`~`) in any Linux command.

ICMP (Internet Control Message Protocol) A protocol for sending error/control messages. Associated with the `ping` command.

ifconfig The `ifconfig` command is used to configure and display network devices.

init The `init` process is the first Linux process called by the kernel. This process starts other processes that compose a working Linux system, including the shell.

Internet Print Protocol (IPP) The Internet Print Protocol (IPP) is the evolving standard for printers shared over networks. It's being adapted by all major operating systems; the Linux implementation is CUPS.

IP forwarding IP forwarding is where data is forwarded between computers or networks through your computer.

iptables The `iptables` command is the basic command for firewalls and masquerading.

KDE A GUI for Linux and Unix computers. Also known as the K Desktop Environment.

kernel The kernel is the heart of any operating system. It loads device drivers. You can recompile a Linux kernel for additional drivers, for faster loading, and to minimize the required memory.

kernel module Kernel modules are pluggable drivers that can be loaded and unloaded into the kernel as needed. Some loaded kernel modules are shown with the `lsmod` command.

Kickstart Kickstart is the Red Hat automated installation system, which allows you to supply the answers required during the installation process. When properly configured, a kickstart floppy can allow you to start your computer and install RHEL 3 automatically from a network source.

LDP (Linux Documentation Project) The LDP is a global effort to produce reliable documentation for all aspects of the Linux operating system. Its work is available online at www.tldp.org.

lftp The **lftp** command starts a slightly more flexible FTP command line client.

Lightweight Directory Access Protocol (LDAP) The Lightweight Directory Access Protocol allows you to keep authentication information on a central server on your network.

locate The **locate** command searches through a default database of files and directories.

logrotate The **logrotate** command utility allows you maintain log files. By default, RHEL 3 uses the **cron** daemon to rotate, compress, and remove various log files.

lpq You can use the **lpq** command to view print jobs still in progress.

lpr You can use the **lpr** command to send print requests.

lprm You can use the **lprm** command to remove print jobs from the queue.

logical extent (LE) A logical extent (LE) is a chunk of disk space that corresponds to a physical extent (PE).

logical volume (LV) A logical volume (LV) is composed of a group of LEs.

Logical Volume Management (LVM) Logical Volume Management (LVM) allows you to set up a filesystem on multiple partitions.

lvcreate The **lvcreate** command creates a logical volume (LV) from a specified number of available PEs.

lvremove The **lvremove** command is functionally opposite to the **lvcreate** command.

masquerading Masquerading enables you to provide Internet access to all of the computers on a LAN with a single public IP address.

MBR (Master Boot Record) The first sector of a bootable disk. Once the BIOS cycle is complete, it looks for a program on the MBR, which then looks at a boot loader configuration file such as **grub.conf** to see how to start an operating system.

mkbootdisk The **mkbootdisk** command can create a boot disk, customized for your system.

mkfs The **mkfs** command can help you format a newly configured partition.

mount The **mount** command can specify mounted partitions, or attach local or network partitions to specified directories.

NAT (Network Address Translation) NAT is a feature associated with firewall commands such as **iptables**, which connects computers inside your LAN to the Internet while disguising their true IP addresses. NAT modifies IP packet headers. The process is reversed for return messages. Closely related to masquerading.

netstat The **netstat** command can display connectivity information for your network cards. For example, the **netstat -r** command is used to display the routing tables as stored in your kernel.

Network Time Protocol (NTP) The Network Time Protocol allows you to synchronize your computer with a central timeserver. You can do this on RHEL 3 with the Date/Time Configuration tool.

NFS (Network File System) NFS is a file-sharing protocol originally developed by Sun Microsystems; it is the networked filesystem most commonly used for networks of Linux and Unix computers.

NIC (Network Interface Card) A NIC connects your computer to a network. A NIC can be anything from a Gigabit Ethernet adapter to a telephone modem.

NIS (Network Information System) NIS allows you to share one centrally managed authorization database for the Linux and Unix systems on your network.

PAM (Pluggable Authentication Module) PAM separates the authentication process from individual applications. PAM consists of a set of dynamically loadable library modules that configure how an application verifies its users before allowing access.

PATH A shell variable that specifies the directories (and in what order) the shell automatically searches for input commands.

PGP (Pretty Good Privacy) A technique for encrypting messages, often used for e-mail. It includes a secure private- and public-key system similar to RSA. The Linux version of PGP is known as GPG.

physical extent (PE) A chunk of disk space created from a PV for LVM.

physical volume(PV) An area of space for an LVM, which usually corresponds to a partition or a hard drive.

Primary Domain Controller (PDC) A PDC is the governing server on a Microsoft Windows NT 4 network. You can configure RHEL 3 with Samba to function as a PDC.

/proc /proc is the Linux *virtual* filesystem. *Virtual* means that it doesn't occupy real disk space. /proc files are used to provide information on kernel configuration and device status.

public/private key Encryption standards such as PGP, GPG, or RSA are based on public/private key pairs. The private key is kept on the local computer; others can decrypt it with the public key.

pvcreate The **pvcreate** command allows you to configure PEs from a properly configured partition.

quota In Linux, a quota can limit users and or groups by number of inodes or disk space. Quotas can include hard and soft limits.

RAID (Redundant Array of Independent Disks) RHEL 3 supports software RAID. You can use Anaconda to set up software RAID 0, 1, and 5 arrays. You can also set up RAID arrays using the **fdisk** and **mkraid** commands, as well as by configuring /etc/raidtab. Also known as Redundant Array of Inexpensive Disks.

RAID 0 A RAID 0 array requires two or more partitions or hard drives. Reads and writes are done in parallel, increasing performance, filling up all partitions or hard

drives equally. RAID 0 includes no redundancy; if any partition or hard drive in the array fails, all data in the array is lost.

RAID 1 A RAID 1 array requires two or more partitions or hard drives. RAID 1 is also known as mirroring, because the same information is written to both partitions. If one disk is damaged, all data will still be intact and accessible from the other disk.

RAID 5 A RAID 5 array requires three or more partitions. Parity information is striped across all partitions. If one disk fails, the data can be rebuilt. It can be automatically written to a spare disk.

Red Hat Certified Engineer (RHCE) Perhaps the most elite certification available for Linux systems administrators. Designed to qualify Linux administrators with significant experience in configuring Linux LANs with Red Hat Enterprise Linux 3.

Red Hat Certified Technician (RHCT) Another elite certification for newer Linux administrators. Designed to qualify Linux administrators with significant experience in configuring Linux workstations with RHEL 3. RHCEs must also meet all RHCT requirements.

Red Hat Hardware Compatibility List The Red Hat Hardware Compatibility List (HCL) specifies all hardware that has been tested on systems running the various Red Hat operating systems. Red Hat provides installation support for any hardware that is listed as “support “ on their HCL.

Red Hat Package Manager (RPM) The Red Hat Package Manager system sets up software in discrete packages. The associated **rpm** command allows you to add, remove, and upgrade packages.

redhat-config-* Red Hat has created a series of GUI configuration tools to help configure a number of different systems and services. You can start them with a number of different commands that start with **redhat-config-***. While it’s usually faster to directly configure a configuration file, not every experienced administrator knows every detail of every major configuration file. I’ve summarized the tools described in this book in Table G-1.

TABLE G-1 Red Hat Configuration Tools

Command	Description
redhat-config-authentication	Supports client computers on NIS, LDAP, and Samba password databases. Also known as the Authentication Configuration tool.
redhat-config-bind	Configures a DNS server. Also known as the Domain Name Service configuration tool.
redhat-config-date	Sets the clock, and supports synchronization with a remote time server. Can also be started with redhat-config-time . Also known as the Date/Time Properties configuration tool.
redhat-config-httpd	Allows you to configure an Apache Web server. Also known as the HTTP configuration tool.
redhat-config-kickstart	Configures a file to automatically install RHEL 3. Also known as the Kickstart Configurator.
redhat-config-mouse	Lets you select a mouse or pointing device.
redhat-config-network	Starts the Network Configuration tool, which can help you configure the network interfaces on your system.
redhat-config-nfs	Allows you to configure exported NFS directories with a wide variety of permissions. Also known as the NFS Server Configuration tool.
redhat-config-packages	Opens the Red Hat Package Management tool, which allows you to manage the software on your system by RPM package or package group.
redhat-config-printer	Starts the Red Hat Printer Configuration tool, which can configure local printers as a server, or connections to remote printers.
redhat-config-proc	Allows you to configure kernel parameters in the /proc directory.
redhat-config-rootpassword	Lets the root user change his or her password.
redhat-config-samba	Starts the Samba Server Configuration tool, which allows you to share directories over a Microsoft Windows-based network.
redhat-config-securitylevel	Opens the Security Level Configuration tool, which allows you to set up a firewall.
redhat-config-services	Starts the Service Configuration tool, which is effectively a front-end for the chkconfig command.
redhat-config-users	Allows you to configure users and groups with the Red Hat User Manager.
redhat-config-xfree86	Opens the Display settings tool, which allows you to configure the graphics card and display.

refresh rate This is the rate at which the image you see on your screen is redrawn, in hertz (Hz).

reverse (inverse) zone A DNS reverse (inverse) zone can be required by some servers, such as Apache and sendmail, to make sure an IP address points to a real computer. If the reverse zone hostname does not match the IP address, the server might not respond.

rndc The **rndc** command is used to manage the operation of a DNS server; it's preferred to commands such as **service named start**.

root This word has multiple meanings in Linux. The root user is the default administrative user. The root directory (/) is the top-level directory in Linux. The root user's home directory, /root, is a subdirectory of the root directory (/).

router A computer that transfers messages between LANs. Computers that are connected to multiple networks often serve as routers.

runlevel RHEL 3 includes six available runlevels, as defined in /etc/inittab. Key runlevels include 1, single-user mode; 3, text login; and 5, GUI login.

Samba The Linux and Unix implementation of the Server Message Block protocol and the Common Internet File System. Allows computers that run Linux and Unix to communicate with computers that are running Microsoft Windows operating systems.

secure Virtual Hosts You can configure multiple secure Virtual Hosts on a single Apache server using the secure configuration file, /etc/httpd/conf.d/ssl.conf.

sendmail A standard e-mail server application. Most Internet e-mail uses sendmail.

server A computer that controls centralized resources such as files and printers. Servers can share these resources with client computers on a network.

SGID The SGID bit sets common group ID permissions on a file or directory.

Shadow Password Suite The Shadow Password Suite creates an additional layer of protection for Linux users and groups in the /etc/shadow and /etc/gshadow files.

showmount The **showmount** command lists the shared directories from an NFS server.

single-user mode When you start RHEL 3 in single-user mode, you're automatically logged in as the root user, without networking or most services. If your Linux system has boot problems, single-user mode may allow enough access to fix the problem.

smbmount and smbmount The **smbmount** and **smbmount** commands, when properly configured, allow regular users to mount directories shared over a Microsoft Windows network through Samba.

SMTP (Simple Mail Transfer Protocol) A TCP/IP protocol for sending mail. sendmail uses SMTP.

SOA (Start of Authority) In a DNS database, the SOA record is the preamble to all zone files. It describes the zone, the DNS server computer (such as *ns.your-domain.com*), the responsible administrator (such as *hostmaster@your-domain.com*), the serial number associated with this file, and other information related to caching and secondary DNS servers.

soft limit Associated with user quotas. Specifies the maximum amount of space a user can have on a partition. Soft limits can be configured with grace periods.

spec file Spec files are associated with SRPMs. You can modify an SRPM spec file to change the way an RPM package is built.

Squid Squid is a high-performance HTTP and FTP caching proxy server.

SRPM (source RPM) SRPMs include the source code required to build a binary RPM package. SRPMs are installed with the **rpm -i** command, which installs SRPM files within the */usr/src/redhat* directory. You can then use the **rpmbuild** command to create a binary RPM.

SUID The SUID bit sets common user ID permissions on a file or directory.

superuser The superuser represents a regular user who has taken root user privileges. Closely associated with the **su** and **sudo** commands.

swap space Linux uses swap space for less frequently used data that would otherwise be stored in RAM. It is normally configured in Linux in a swap partition.

TCP/IP (Transmission Control Protocol/Internet Protocol) TCP/IP is a suite of communications protocols for internetwork communication. It is primarily used as the communication system for the Internet.

Telnet A terminal emulation program that allows you to connect to remote computers. RHEL 3 includes the Kerberos version of the Telnet server, as configured through the `/etc/xinetd.d/krb5-telnet` configuration file.

tmpwatch The **tmpwatch** command removes files that have not been accessed in a specified number of hours. The default daily **tmpwatch** script checks files in the `/tmp` and `/var/tmp` directories.

Very Secure FTP (vsFTP) The Very Secure FTP service is the default FTP server for RHEL 3.

umask The **umask** command defines default permissions for newly created files.

user ID (UID) Every Linux user has a user ID, as defined in `/etc/passwd`.

usermod The **usermod** command modifies different settings in `/etc/passwd`, such as expiration date and additional groups.

vgcreate Creates a volume group (VG) from two or more physical volumes (PV) for LVM.

vi The vi editor is a basic Linux text editor. While other editors are more popular, vi may be the only editor you have available in the **linux rescue** environment.

Virtual Hhosts You can configure multiple Web sites on a single Apache server, by configuring a number of Virtual Hosts in your `/etc/httpd/conf/httpd.conf` configuration file.

volume group (VG) A collection of physical volumes (PV) in LVM.

window manager The window manager is a special type of X client, which controls how other X clients appear on your display.

WINS (Windows Internet Name Service) WINS provides name resolution on Microsoft networks; it can be activated on Samba.

X client An X client is an application that uses the X server services to display output.

X Display The X Display is a console and a virtual window. By default, there are six virtual consoles configured with Linux; the X Display is associated with virtual console number seven.

X Font Server The X Font Server, **xfs**, has to run before you can start the Linux GUI.

X server The X server is the part of the X Window System that runs on your desktop. The X server draws images on your screen, takes input from your keyboard and mouse, and controls access to your display.

X Window System The GUI for Linux is also known as X Window. Unlike other applications, the X Window System is a layered application.

XFree86 The XFree86 server is the default X server for RHEL 3.

xhost The **xhost** command can be used to allow other hosts to access your X server. In other words, you can configure remote X clients to send their display to the local X server.

xinetd daemon The **xinetd** “super-server” daemon controls connections to servers in the `/etc/xinetd.d` directory such as the Kerberos Telnet server and POP3 e-mail.

ypbind The NIS client service is **ypbind**.

ypserv The NIS server service is **ypserv**.

zebra The RHEL 3 gateway daemon is **zebra**, which you need to activate before your computer can be configured as a router.