



# Glossary

**Access control list (ACL)** Access control lists (ACLs) provide an additional layer of access control to files and directories stored in extended attributes on the filesystem. These ACLs are set and verified with the **setfacl** and **getfacl** commands.

**Address Resolution Protocol (ARP)** A protocol that maps an IP address to the hardware (MAC) address of a network interface.

**anacron** The anacron service is designed to run **cron** jobs that could not run while a server was powered down; this is now integrated into periodic job management through the `/etc/anacrontab` file.

**Apache web server** The Apache web server provides both normal and secure web services via the **httpd** daemon.

**apachectl** The **apachectl** command is a method to start, stop, and reload an Apache server; the **apachectl graceful** command reloads a revised configuration file without resetting existing connections.

**arp** 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 manually 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.

**automounter** The automounter can be configured to mount local and network directories on an as-needed basis. It's configured in the `auto.master`, `auto.net`, `auto.misc`, and `auto.smb` files in the `/etc` directory.

**bash** The default shell for Linux users is `bash`, also known as the Bourne-Again Shell.

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

**BIOS** The BIOS is the Basic Input/Output System. It initializes hardware resources when you power up your computer. On most modern systems, the BIOS has been replaced by the UEFI. The BIOS menu allows you to customize many options, including the sequence of boot media.

**/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.

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

**CentOS** The Community Enterprise Operating System is a “rebuild” of RHEL based on Red Hat source code.

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

**chattr** The **chattr** command allows you to change file attributes.

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

**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 a file-sharing protocol widely used on Microsoft Windows systems. It's also supported by the version of Samba included with RHEL 7.

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

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

**/dev** This directory includes 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.

**dmesg** The **dmesg** command lists the kernel ring buffer and the initial boot messages. If your system successfully boots, `/var/log/dmesg` is one place to look for messages.

**DNS (Domain Name System)** The DNS service maintains a database of IP addresses and fully qualified domain names, such as `www.mheducation.com`. If the domain name is not in the local database, DNS is normally configured to forward the query to another DNS server.

**dumpe2fs** The **dumpe2fs** command provides various information about an ext2/ext3/ext4 filesystem.

**e2label** The **e2label** command associates a label to an ext2/ext3/ext4 filesystem.

**Environment** Each user's environment specifies default variables that define the login prompt, terminal, the PATH, mail directory, and more.

**/etc/fstab** The `/etc/fstab` configuration file defines the filesystems to be mounted at boot.

**/etc/ntp.conf** The main NTP server configuration file.

**exportfs** The **exportfs** command allows directories to be shared as NFS volumes on a network.

**ext2/ext3/ext4** The second, third, and fourth extended filesystems (ext2, ext3, ext4). The ext3 and ext4 filesystems include journaling. The ext4 filesystem can handle a maximum size of 1 exabyte (1,000,000 terabytes).

**fdisk** A standard disk partition command utility that allows you to modify the physical and logical disk MBR 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 <https://fedoraproject.org>.

**Filesystem** Filesystem has multiple meanings in Linux. It refers to mounted storage volumes; the root directory (/) filesystem is mounted on its own filesystem. It also refers to filesystem formats; RHEL 7 volumes are typically formatted to the XFS filesystem.

**Firewall** A hardware or software system that prevents unauthorized access to and from a network.

**firewall-cmd** A command-line tool to administer firewalld.

**firewalld** A zone-based firewall that is activated by default on RHEL 7.

**fsck** The **fsck** command checks a filesystem on a Linux partition for consistency. Variations on this command are available for specific filesystems, such as **fsck.ext3**, **fsck.ext4**, and **fsck.xfs**.

**FTP (File Transfer Protocol)** The FTP protocol is a TCP/IP protocol designed to transfer files on a network.

**Gateway** The word *gateway* has multiple meanings in Linux. A default gateway address is the IP address of a computer or router that connects two network segments, such as a local subnet to the Internet. A gateway can also be a router between networks.

**gdisk** A disk partition command utility that allows you to modify partitions created with the GPT partitioning scheme.

**genkey** The **genkey** command supports the generation of SSL keys for secure websites.

**getfacl** The **getfacl** command lets you read access control lists (ACLs) on files and directories.

**getsebool** The **getsebool** command lets you read the current status of an SELinux boolean.

**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. On RHEL 7, GPG is available with the **gpg2** command.

**GPL** The GPL is the General Public License, under which most Linux software is released.

**Group ID** Every Linux group has a group ID, usually defined in `/etc/group`.

**GRUB 2 (Grand Unified Bootloader version 2)** The default boot loader for RHEL 7.

**grub2-install** The **grub2-install** command installs the GRUB 2 bootloader on a device, such as `/boot/grub/grub`.

**GUID Partition Table (GPT)** A disk-partitioning scheme that supports up to 128 partitions.

**Home directory** The home directory is the default 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 the bash shell.

**htpasswd** The **htpasswd** command creates a password database that can be used with an Apache web server for HTTP authentication.

**Hypervisor** A virtual machine manager that allows a guest operating system to run on a host computer.

**ICMP (Internet Control Message Protocol)** A protocol for sending error control messages on a network. ICMP is associated with the **ping** command.

**ifconfig** The **ifconfig** command is considered obsolete. It is replaced by the **ip** command.

**Initial RAM disk** RHEL uses an initial RAM disk in the boot process; it's stored as an `initramfs-`uname -r`.img` file in the `/boot` directory.

**ip** The **ip** command is used to configure and display network devices.

**IP forwarding** IP forwarding is a kernel parameter that allows you to route packets between two different network interfaces on a system.

**iptables** The **iptables** command is the basic command to configure firewall rules and network address translation (NAT).

**IPv4, IPv6** IPv4 and IPv6 are different versions of the IP protocol. Version 4 is based on 32-bit addresses; version 6 is meant to replace version 4 and is based on 128-bit addresses.

**iSCSI (Internet SCSI)** Internet SCSI is a protocol that allows clients (iSCSI initiators) to send SCSI commands to storage devices (iSCSI targets) over an IP-based network.

**iscsiadm** The **iscsiadm** command allows you to set up connections to remote iSCSI targets from an iSCSI initiator.

**journalctl** The **journalctl** command displays the content of the systemd journal.

**Kdump** Kdump is a kernel crash dump service for Linux.

**Kerberos** Kerberos is a protocol that provides authentication services over an insecure network for users, hosts, and services.

**Kernel** The kernel is the heart of any operating system. The Linux kernel is monolithic and can load some of its code as separate modules at run time.

**Kernel module** Kernel modules are object files that can be loaded and unloaded into the kernel as needed. Loaded kernel modules are shown with the **lsmod** command.

**Kickstart** Kickstart is the Red Hat automated installation system, where answers to installation questions can be supplied from a single text file.

**KVM** KVM, the Kernel-based Virtual Machine, is the default virtualization technology for RHEL 7.

**lftp** The **lftp** command starts a flexible FTP command-line client.

**Lightweight Directory Access Protocol (LDAP)** The Lightweight Directory Access Protocol provides a central user authentication database.

**Live CD** Used in reference to a complete Linux operating system that can be booted directly from CD/DVD media.

**locate** The **locate** command searches through a default database of files and directories. The database is refreshed daily with the **mlocate** cron script in the `/etc/cron.daily` directory.

**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 logical extents (LEs).

**Logical Volume Management (LVM)** Logical Volume Management (LVM) allows you to set up a filesystem on multiple partitions. Also known as the Logical Volume Manager.

**logrotate** The **logrotate** command utility supports automated log file maintenance. With the help of cron, it rotates, compresses, and removes various log files.

**lsattr** The **lsattr** command lists file attributes.

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

**lvdisplay** The **lvdisplay** command specifies current configuration information for logical volumes (LVs).

**lvextend** The **lvextend** command allows you to increase the size of a logical volume (LV).

**lvremove** The **lvremove** command deletes a logical volume (LV).

**Masquerading** Masquerading is a form of network address translation (NAT). It allows you to provide Internet access to all of the computers on a LAN with a single public IP address.

**MBR (Master Boot Record)** The MBR is a type of boot sector and partitioning format. Once the BIOS cycle is complete, it looks for a pointer on the boot disk's MBR, which then looks at a boot loader configuration file such as `grub.conf` for directions on how to start an operating system.

**MD5 (Message Digest 5)** A hashing algorithm. Although it's no longer the default hashing scheme for Linux user passwords, it is still used for other passwords such as those in the GRUB 2 configuration file.

**mkfs** The **mkfs** command can help you format a newly configured volume. Variations are available, including **mkfs.xfs**, which formats to the default XFS filesystem.

**mkswap** The **mkswap** command can help you set up a newly configured volume as swap space.

**modprobe** You can use the **modprobe** command to add and remove kernel modules.

**mount** You can use the **mount** command to list mounted partitions, or attach local or network partitions to specified directories. Variations are available for different network mounts, such as `mount.nfs`, `mount.nfs4`, and `mount.cifs`.

**NAT (Network Address Translation)** NAT allows you to map an IP address into another one on a different network segment. It can be used to make computers inside a LAN visible to an external network such as the Internet, while disguising their true IP addresses.

**netstat** The **netstat** command is considered obsolete and is replaced by the **ss** command.

**Network Manager** Network Manager (sometimes shown as one word) is a service to monitor and manage network settings. It is associated with commands such as **nmcli**, **nmtool**, and **nm-connection-editor**.

**Network Time Protocol (NTP)** The Network Time Protocol supports time synchronization between the local computer and a central timeserver.



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

**nmap** A port scanner that can review the open and available status of TCP/IP ports.

**PAM (Pluggable Authentication Modules)** PAM separates the authentication process from individual applications. PAM consists of a set of dynamically loadable library modules that provide various authentication and authorization mechanisms.

**parted** A standard disk partition command utility that allows you to modify the physical and logical disk partition layout. Be careful when using **parted** because changes are immediately written to the partition table.

**PATH** A shell variable that specifies which directories (and in what order) the shell automatically searches for 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 (GNU Privacy Guard).

**Physical extent (PE)** A chunk of disk space created from a physical volume (PV) for the Logical Volume Manager (LVM).

**Physical volume (PV)** An area of space for the Logical Volume Manager (LVM) that usually corresponds to a partition or a hard drive.

**PolicyKit** The PolicyKit is a security framework used primarily for administrative configuration tools when working from a GNOME desktop environment.

**Postfix** A standard e-mail server application used by many Internet e-mail servers. The default Red Hat solution for RHEL 7.

**Parallel ATA (PATA)** Parallel ATA is an old interface standard associated with older IDE drives, also known as ATA (Advanced Technology Attachment).

**/proc** /proc is a 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, and RSA are based on public/private key pairs. The private key is kept on the local computer; others can decrypt messages with the public key.

**pvccreate** The **pvccreate** command allows you to create physical volumes (PVs) from a partition or disk drive.

**pvdiskdisplay** The **pvdiskdisplay** command specifies current configuration information for physical volumes (PVs).

**QEMU** The hypervisor used with the Red Hat implementation of KVM. It is sometimes known by its former acronym, the quick emulator.

**Red Hat Certified Engineer (RHCE)** An elite certification available for Linux professionals. It qualifies Linux administrators with significant experience in Linux services on Red Hat Enterprise Linux. Although the RHCE exam can be taken first, a candidate must pass both the RHCSA and RHCE exams before Red Hat awards that person the RHCE credential.

**Red Hat Certified System Administrator (RHCSA)** Another certification available for Linux systems administrators. It's designed to qualify Linux professionals with significant experience in systems administration.

**Red Hat Package Manager (RPM)** The Red Hat Package Manager is a package management system that allows software to be distributed in special RPM files. The associated **rpm** command allows you to add, remove, upgrade, and erase packages and more.

**Red Hat Subscription Management (RHSM)** Red Hat Subscription Management (RHSM) replaces the Red Hat Network (RHN). It supports remote administration of systems and of their subscriptions.

**relayhost** The **relayhost** directive in Postfix supports a connection to a smart host.

**resize2fs** The **resize2fs** command allows you to extend the size of an ext filesystem.

**Rescue target** When RHEL starts in rescue target mode, it provides a rescue shell to troubleshoot system boot problems.

**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 host that forwards packets between network segments. Computers that are connected to multiple networks often serve as routers.

**rpc.mountd** The rpc.mountd daemon supports mount requests for shared NFS directories.

**rwX/ugo** A reference to basic Linux permissions and ownership on a file; rwX/ugo stands for read, write, execute, user, group, other.

**Samba** The Linux and Unix implementation of the Server Message Block protocol and the Common Internet File System (CIFS). Samba allows computers that run Linux and Unix to communicate with computers that run Microsoft Windows operating systems.

**Scientific Linux** A “rebuild” of RHEL developed by scientists associated with Fermilab and CERN. That rebuild is based on Red Hat source code.

**sealert** The **sealert** command, with audit log files in the /var/log/audit directory, supports detailed analysis of SELinux problems.

**Secure virtual host** An Apache virtual host with support for secure HTTP (HTTPS). You can configure multiple secure virtual hosts on a single Apache server.

**Security Enhanced Linux (SELinux)** An implementation of mandatory access control integrated into the Linux kernel; in essence, SELinux provides a different way of layering security within Linux and enforcing a security policy by the Linux kernel.

**SELinux Troubleshooter** A GUI tool for troubleshooting SELinux log messages.

**Sendmail** A standard e-mail server application used by most Internet e-mail. Sendmail was the default Red Hat solution until RHEL 5; it is still supported by Red Hat on RHEL 7.

**Serial ATA (SATA)** A standard protocol on hard drives that replaced the Parallel ATA (PATA) standard.

**Serial Attached SCSI (SAS)** A protocol compatible with SATA that replaced the old Parallel SCSI bus technology.

**Server** A computer that controls centralized resources such as web services, or shared files and printers. Servers can share these resources with client computers on a network.

**setfacl** The **setfacl** command lets you set access control lists (ACLs) on files and directories.

**setsebool** The **setsebool** command lets you change the status of an SELinux boolean.

**SGID** The SGID bit sets the set-group permissions bit on a file or directory. It allows the file to be executed with the effective GID of the group owner. If it is set on a directory, files created within the directory will belong to its group owner.

**SHA2, SHA256, SHA512** A series of secure hash algorithms created by the NSA, now in more common use on RHEL 7. SHA512 is the default hashing algorithm for user passwords.

**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.

**smbpasswd** The **smbpasswd** command helps you create usernames and passwords for a Samba network.

**SMTP (Simple Mail Transfer Protocol)** SMTP is a TCP/IP protocol for sending mail; used by sendmail.

**ss** The **ss** command displays network connections on the local system. For example, the **ss -tupa** command is used to display all active TCP and UDP sockets.

**ssh-copy-id** The **ssh-copy-id** command can help you copy a public SSH key to the appropriate location on a remote system to set up secure connections without regular passwords.

**ssh-keygen** The **ssh-keygen** command can help you create a public-private keypair for SSH-based authentication.

**SUID** The SUID bit is the set-user identification bit on a file. It allows the file to be executed with the effective UID of the file owner.

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

**Swap space** Linux uses swap space as an extension of physical RAM. It is normally configured in Linux in a swap partition.

**systemctl** The **systemctl** command manages various functionalities of systemd. It can activate or deactivate service units, modify the default target, and automatically activate service units at boot time.

**system-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 begin with **system-config-\***. Although it's usually faster to configure a file directly, not every experienced administrator knows every detail of every major configuration file.

**systemd** systemd is the first process that is started at boot. It initializes the system and activates appropriate system units. It replaces the traditional init daemon found on RHEL 6.

**systemd journal** The logging system of systemd.

**Target unit** A group of systemd units that a system can activate at boot. Common targets are the multi-user and graphical targets.

**targetcli** An interactive command-line tool to create and administer iSCSI targets.

**telnet** A terminal emulation program that allows you to connect to remote computers. The **telnet** command can be used to test the availability of services on specified port numbers.

**testparm** The **testparm** command is a syntax checker for the main Samba configuration file, **smb.conf**.

**UEFI** The UEFI is the Unified Extensible Firmware Interface that initializes hardware devices when you power up your computer. On most modern systems, it has replaced the BIOS. The UEFI menu allows you to customize many options, including the sequence of boot media.

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

**Unbound** Unbound can be used in place of BIND to set up a recursive and caching name server.

**Universally Unique Identifier (UUID)** A UUID is a unique 128-bit number, often associated with formatted storage volumes. A current list is available in the output to the **blkid** command. It's used to identify volumes to be mounted in the `/etc/fstab` file.

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

**useradd** The **useradd** command creates a new user account.

**usermod** The **usermod** command modifies different user account settings, such as the account expiration date and group membership.

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

**vgcreate** The **vgcreate** command creates a volume group (VG) from one or more physical volumes (PVs) for the Logical Volume Manager (LVM).

**vgdisplay** The **vgdisplay** command specifies current configuration information for volume groups (VGs).

**vgextend** The **vgextend** command allows you to increase the extents or space allocated to a volume group (VG).

**vi** The vi editor is a basic Linux text editor. While other editors are more popular, vi (or vi improved, also known as vim) may be the only editor you have available in certain rescue environments.

**virsh** The **virsh** command supports the management of virtual machines on RHEL 7.

**virt-clone** The **virt-clone** command supports the copying of an existing virtual machine on RHEL 7.

**virt-install** The **virt-install** command supports the creation of a virtual machine on RHEL 7.

**Virtual hosts** You can configure multiple websites on a single Apache server by configuring a number of virtual hosts for the Apache configuration file.

**Virtual machine (VM)** A system where an application or an entire operating system is run with the help of a hypervisor such as QEMU and a virtualization solution such as KVM.

**Virtualization** Virtualization is an abstraction of computer resources. It is most often associated with hardware virtualization, in which you can run one or more virtual machines on a physical system. The default RHEL 7 virtualization solution is KVM.

**Volume group (VG)** A collection of physical volumes (PVs) in the Logical Volume Manager (LVM).

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

**XFS** The default filesystem on RHEL 7. It supports journaling and a maximum filesystem size of 8 exabytes (EB).

**xfs\_growfs** The **xfs\_growfs** command allows you to extend the size of an XFS filesystem.