Appendix B

Command Reference

Understanding Linux commands, the syntax and purpose is critical to being a successful Linux administrator. Appendix B is a helpful reference tool with all the Linux commands that are discussed in the course, grouped by lesson and topic order.

Basic Linux Commands

Command	Syntax	Purpose	Covered in
`ls`	`ls [option]`	List the contents of the current directory.	Lesson 1, Topic B
`cat`	`cat [file-name]`	Display the contents of a text file on the screen.	Lesson 1, Topic B
`cd`	`cd /etc`	Change from one directory to another.	Lesson 1, Topic B
`pwd`	`pwd`	Displays the present working directory.	Lesson 1, Topic B
`whoami`	`whoami`	Displays the username of the current user.	Lesson 1, Topic B
`touch`	`touch [file-name]`	Create a new empty file or update the timestamp on an existing file.	Lesson 1, Topic B
`man`	`man [command]`	Display manual, or help, pages for a specific command.	Lesson 1, Topic C
`whatis`	`whatis [command]`	Provides a brief description of the specified command.	Lesson 1, Topic C

Commands Related to Administering Users and Groups

Command	Syntax	Purpose	Covered in
`passwd`	`passwd [user-name]`	Manage user passwords.	Lesson 2, Topic A
`chage`	`chage -options`	Manage password settings.	Lesson 2, Topic A
`w`	`w`	Display current users on the system.	Lesson 2, Topic A
`who`	`who`	Display current users on the system.	Lesson 2, Topic A
`useradd`	`useradd -options argument`	Add a user.	Lesson 2, Topic A

Command	Syntax	Purpose	Covered in
`usermod`	`usermod -options argument`	Modify a user.	Lesson 2, Topic A
`userdel`	`userdel [user-name]`	Delete a user.	Lesson 2, Topic A
`id`	`id [user-name]`	Gather and display account information.	Lesson 2, Topic A
`groupadd`	`groupadd [group-name]`	Create a new group.	Lesson 2, Topic B
`groupmod`	`groupmod -options argument`	Modify an existing group.	Lesson 2, Topic B
`groupdel`	`groupdel [group-name]`	Remove an existing group.	Lesson 2, Topic B
`su`	`su - [user-name]`	Switch user to the specified user or account name.	Lesson 2, Topic C
`sudo`	`sudo -options [command]`	Exercise delegated privileges.	Lesson 2, Topic C
`pkexec`	`pkexec program argument`	Allows an authorized user to execute an action.	Lesson 2, Topic C

Permissions Configuration Commands

Command	Syntax	Purpose	Covered in
`umask`	`umask {number}`	Alter the default permissions on newly created files and directories.	Lesson 3, Topic A
`chmod`	`chmod [options] {mode} {file/directory name}`	Modify the permissions of a file or directory.	Lesson 3, Topic A
`chown`	Varies based on desired outcome: • Change the owner but not the group: `chown {newowner} {filename}` • Change both the owner and the group: `chown {newowner}:{newgroup} {filename}` • Change the group but not the owner: `chown :{newgroup} {filename}`	Change the owner, the group, or both for a file or directory.	Lesson 3, Topic A

Command	Syntax	Purpose	Covered in
chgrp	chgrp {group name} {file/directory name}	Change the group ownership of a file or directory.	Lesson 3, Topic A
lsattr	lsattr [options] {file/directory names}	List attributes of a file or a directory.	Lesson 3, Topic A
chattr	chattr [-R] [-v {version}] [+- {attributes}] {file/directory names}	Change attributes of a file or a directory.	Lesson 3, Topic A
getfacl	getfacl {filename}	Retrieve the ACLs of files and directories.	Lesson 3, Topic C
setfacl	setfacl [-bR] [-mx {acl_spec}] {file/directory names}	Change the permissions associated with the ACL of a file or directory.	Lesson 3, Topic C

File Management Commands

Command	Syntax	Purpose	Covered in
stat	stat {file-name}	Display file metadata in a relatively user-friendly structure.	Lesson 4, Topic A
file	file {file-name}	Display file information based on the file type.	Lesson 4, Topic A
ln	ln [options] {target-name} {link-name}	Create links, either hard or symbolic.	Lesson 4, Topic A
cd	cd {path}	Move your present working directory to another directory.	Lesson 4, Topic B
tree	tree {directory-name}	Display the filesystem in a hierarchical structure, perhaps making it easier to understand a directory's location relative to other directories.	Lesson 4, Topic B
mkdir	mkdir {new-directory-name}	Create directories along the specified path.	Lesson 4, Topic B
cp	cp {source-file} {new-file}	Copy a file into a new location while retaining the source file in its original location.	Lesson 4, Topic B

Command	Syntax	Purpose	Covered in
`mv`	`mv {source-location} {destination-location}`	Place the file elsewhere in the filesystem.	Lesson 4, Topic B
`mv`	`mv {original-filename} {new-filename}`	The rename command in Bash.	Lesson 4, Topic B
`rmdir`	`rmdir {directory-name}`	Remove (delete) a directory with no files in it.	Lesson 4, Topic B
`rm`	`rm [options] {file-name}`	Remove (delete) a file or a non-empty directory.	Lesson 4, Topic B
`head`	`head {file-name}`	Display the first 10 lines of a file.	Lesson 4, Topic B
`tail`	`tail {file-name}`	Display the last 10 lines of a file.	Lesson 4, Topic B
`grep`	`grep {character-string]`	Search for strings of characters within a data stream. Grep is case-sensitive unless the -i option is used.	Lesson 4, Topic B
`xargs`	`command [options] [arguments] | xargs [options] {command}`	Read from standard input and executes a command for each argument provided.	Lesson 4, Topic B
`tee`	`command [options] [arguments] | tee [options] {file names}`	Read the standard input, sends the output to the default output device (the CLI), and also copies the output to each specified file.	Lesson 4, Topic B
`find`	`find {where to search} {search criteria}`	Search the filesystem for files that match the given parameters.	Lesson 4, Topic C
`locate`	`locate [options] {string}`	Search for files and directories along a specified path.	Lesson 4, Topic C
`updatedb`	`updatedb`	Build and update a database of files based on the /etc/updatedb.conf file.	Lesson 4, Topic C
`which`	`which {command}`	Display complete path of a specified command.	Lesson 4, Topic C

Commands for Authoring Text Files

Command	Syntax	Purpose	Covered in
`tar`	`tar [options] {file1, file2 ...}`	Bundle files for easier transfer.	Lesson 5, Topic B
`gzip`	`gzip [options] [file-names]`	Reduce size of files.	Lesson 5, Topic B
`xz`	`xz [options] [file-names]`	Reduce size of files.	Lesson 5, Topic B
`bzip2`	`bzip2 [options] {file-names}`	Manage file compression.	Lesson 5, Topic B
`zip`	`zip [options] [file-names]`	Reduce size of files with archiving functionality.	Lesson 5, Topic B

Software Management Commands

Command	Syntax	Purpose	Covered in
`rpm`	`rpm [options] {package-name}`	Package management in Red Hat distros.	Lesson 6, Topic B
`yum`	`yum [options] [subcommand] {package-name}`	Software package management in Red Hat distros.	Lesson 6, Topic B
`apt`	`apt [subcommands] {package-name}`	Package management in Debian-based distros.	Lesson 6, Topic C
`dpkg`	`dpkg [options] {package-name}`	Manage software packages in older Debian-based distros.	Lesson 6, Topic C
`wget`	`wget [options] {URL}`	Download package files housed on websites from the command line.	Lesson 6, Topic E
`curl`	`curl [options] {URL}`	Download package files housed on websites from the command line.	Lesson 6, Topic E

Commands for Administering Storage

Command	Syntax	Purpose	Covered in
`lsblk`	`lsblk {drive-path}`	Display information about storage devices recognized by the system.	Lesson 7, Topic B
`lsscsi`	`lsscsi [options]`	Display information about SCSI devices.	Lesson 7, Topic B
`fdisk`	`fdisk [options] {device-name}`	Create, modify, or delete partitions on a storage drive.	Lesson 7, Topic B
`parted`	`parted [options] {device-name}`	Create, destroy, and resize partitions.	Lesson 7, Topic B
`mkfs`	`mkfs [options] {filesystem-name} {partition-name}`	Format new partitions.	Lesson 7, Topic B
`mount`	`mount {filesystem-name} {directory-name}`	Attach storage to the FHS.	Lesson 7, Topic B
`umount`	`umount {filesystem-name} {directory-name}`	Detach storage from the FHS.	Lesson 7, Topic B
`df`	`df [options] {directory-name}`	Display device storage information.	Lesson 7, Topic B
`du`	`du [options] {directory-name}`	Display device usage information.	Lesson 7, Topic B
`e2label`	`e2label /dev/ {device name} {partition number} {label name}`	Display or modify file system labels.	Lesson 7, Topic B
`resize2fs`	`resize2fs [options] {device/file system name} [desired size]`	Change the size of an ext2/3/4 file system on a device.	Lesson 7, Topic B
`tune2fs`	`tune2fs [options] {device/ file system name}`	Configure parameters associated with an ext2/3/4 file system.	Lesson 7, Topic B

Command	Syntax	Purpose	Covered in
dumpe2fs	dumpe2fs [options] {device/ file system name}	Dump ext2, ext3, and ext4 file system information.	Lesson 7, Topic B
cryptsetup	cryptsetup [options] {action} [action arguments]	Encrypt data before it is written to disk.	Lesson 7, Topic C
shred	shred [options] {file-name}	Securely wipe a storage device by overwriting contents with random data or all zeros.	Lesson 7, Topic C
iostat	iostat [options] [device names]	Display reports on CPU and device storage.	Lesson 7, Topic D
ioping	ioping [options] {file/ directory/ device name}	Generate a report of device I/O latency in real time.	Lesson 7, Topic D

Commands for Managing Devices, Processes, Memory and the Kernel

Command	Syntax	Purpose	Covered in
hwinfo	hwinfo [options] {device}	Display detailed information about hardware resources.	Lesson 8, Topic A
dmidecode	dmidecode [options] {device}	Display system information for current devices.	Lesson 8, Topic A
lspci	lspci [options]	Display information about devices attached to specific busses.	Lesson 8, Topic A
lsusb	lsusb [options]	Display information about devices attached to specific busses.	Lesson 8, Topic A
lscpu	lscpu [options]	Display CPU information.	Lesson 8, Topic A
lsmem	lsmem [options]	Display information about memory blocks.	Lesson 8, Topic A

Command	Syntax	Purpose	Covered in
`ps`	*The ps command supports multiple command syntax formats.*	Display process status.	Lesson 8, Topic B
`sar`	`sar [options]`	Display system usage reports.	Lesson 8, Topic B
`nohup`	`nohup {command/script}`	Prevent a process from ending when the user logs off.	Lesson 8, Topic B
`mkswap`	`mkswap [options]`	Create swap space on a storage partition.	Lesson 8, Topic C
`swapon`	`swapon [options]`	Activate the swap partition on a specific device.	Lesson 8, Topic C
`swapoff`	`swapoff [options]`	Deactivate the swap partition on a specific device.	Lesson 8, Topic C
`free`	`free [options]`	Display the quantity of free or unused memory.	Lesson 8, Topic C
`vmstat`	`vmstat [options]`	Display the virtual memory usage.	Lesson 8, Topic C
`modinfo`	`modinfo [options] {module-name}`	Display information about a particular kernel module.	Lesson 8, Topic D
`insmod`	`insmod {module-name}`	Install a module into the currently running kernel.	Lesson 8, Topic D
`rmmod`	`rmmod {module-name}`	Remove a module from the currently running kernel.	Lesson 8, Topic D
`modprobe`	`modprobe [options] {module-names}`	Add or remove modules from a kernel.	Lesson 8, Topic D
`depmod`	`depmod [options]`	Build the modules.dep file by aggregating all instances of symbols being exported and used.	Lesson 8, Topic D
`sysctl`	`sysctl [options]`	View or set kernel parameters at runtime.	Lesson 8, Topic D
`dmesg`	`dmesg [options]`	Print any messages that have been sent to the kernel's message buffer during and after system boot.	Lesson 8, Topic D

Service Management Commands

Command	Syntax	Purpose	Covered in
`systemctl`	`systemctl [subcommand] [argument]`	Manage startup options.	Lesson 9, Topic A
`service`	`service [options] [service] [subcommand]`	Manage enabling and starting services under SysVinit.	Lesson 9, Topic A
`chkconfig`	`chkconfig [options] [service] [subcommand]`	• Control services in each runlevel. • Start or stop services during system startup.	Lesson 9, Topic A
`crontab`	`crontab [options]`	Schedule an event by editing the crontab file.	Lesson 9, Topic B
`at`	`at [options] {time}`	Run a task once at a specified time.	Lesson 9, Topic B
`lpr`	`lpr [options] [file names]`	Submit files for printing.	Lesson 9, Topic B
`date`	`date [options] [format]`	Print the date in a specified format.	Lesson 9, Topic C
`timedatectl`	`timedatectl [options] [subcommand]`	Set the system date and time information.	Lesson 9, Topic C
`localectl`	`localectl [options] [subcommand]`	View and configure the system locale and keyboard layout settings.	Lesson 9, Topic C

Network Setting Configuration Commands

Command	Syntax	Purpose	Covered in
`ip`	`ip [options] {object} [subcommand]`	Display IP address, subnet mask, and MAC address settings.	Lesson 10, Topic B
`ifconfig`	`ifconfig [options] [interface]`	Display current IP address information for each NIC recognized by the system.	Lesson 10, Topic B
`iwconfig`	`iwconfig [options] [interface]`	Provide wireless NIC configurations and settings.	Lesson 10, Topic B

Command	Syntax	Purpose	Covered in
`nmcli`	`nmcli [options] [subcommand] [arguments]`	View and manage network settings.	Lesson 10, Topic B
`ethtool`	`ethtool [options] {device name}`	Manage NIC driver and network configurations.	Lesson 10, Topic B
`hostnamectl`	`hostnamectl [options] [subcommand] [arguments]`	View system's network hostname.	Lesson 10, Topic B
`netcat`	`netcat [options]`	Test connectivity and send data across network connections.	Lesson 10, Topic C
`iftop`	`iftop [options] [-i {interface}]`	Display bandwidth usage information.	Lesson 10, Topic C
`traceroute`	`traceroute [options] {destination}`	Report the network path between the source and destination computers.	Lesson 10, Topic C
`tracepath`	`tracepath [options] {destination}`	Report the network path between the source and destination computers.	Lesson 10, Topic C
`resolvectl`	`resolvectl query {domain-name}`	Manually query name resolution services.	Lesson 10, Topic D
`dig`	`dig {domain name}`	Test name resolution.	Lesson 10, Topic D
`nslookup`	`nslookup {domain name}`	Gather information about and test name resolution.	Lesson 10, Topic D
`host`	`host {domain name}`	Gather information about and test name resolution.	Lesson 10, Topic D
`whois`	`whois [options] {domain name}`	Display hostname, FQDN, IP address, and other information about a given host.	Lesson 10, Topic D
`arp`	`arp [options]`	Discover information about known MAC addresses.	Lesson 10, Topic D

Network Security Configuration Commands

Command	Syntax	Purpose	Covered in
`iptables`	`iptables [options] [-t table] [commands] {chain/rule specification}`	Manage packet filtering and stateful firewall functions.	Lesson 11, Topic A
`firewall-cmd`	`firewall-cmd [options]`	Configure firewalld by querying and modifying zones or services as desired.	Lesson 11, Topic A
`ufw`	`ufw [options] {action}`	Configure nftables or iptables.	Lesson 11, Topic A
`ping`	`ping [options] {destination}`	Generate a response request from the sending computer, which should receive a reply from the destination computer.	Lesson 11, Topic B
`traceroute`	`traceroute [options] {destination}`	Display each hop along the network path.	Lesson 11, Topic B
`tracepath`	`tracepath [options] {destination}`	Display each hop along the network path.	Lesson 11, Topic B
`mtr`	`mtr [options] [hostname]`	Test network connection quality and packet loss.	Lesson 11, Topic B
`netstat`	`netstat [options]`	Gather information about TCP connections to the system.	Lesson 11, Topic B
`ss`	`ss [options]`	Gather information about TCP connections and display in a simple output.	Lesson 11, Topic B
`tcpdump`	`tcpdump [options] [-i {interface}] [host {IP address}]`	Determine traffic type and content.	Lesson 11, Topic B
`nmap`	`nmap [options] [target]`	Report extremely detailed information about a network.	Lesson 11, Topic B

Security Management Commands

Command	Syntax	Purpose	Covered in
`md5sum`	`md5sum options] [file name]`	Calculate the hash value of a file with the MD5 hash function.	Lesson 12, Topic B
`sha#sum`	`sha#sum options] [file name]`	Calculate the hash value of a file with the SHA hash function.	Lesson 12, Topic B
`chcon`	`chcon {-u|-r|-t} {context value} {file or directory name}`	Temporarily change the SELinux context of a resource.	Lesson 12, Topic D
`apparmor_status`	*No additional options or subcommands.*	Display the current status of AppArmor profiles.	Lesson 12, Topic D
`aa-complain`	`aa- complain {path to profile}`	Place an AppArmor profile in complain mode.	Lesson 12, Topic D
`aa-enforce`	`aa- enforce {path to profile}`	Place an AppArmor profile in enforce mode.	Lesson 12, Topic D
`aa-disable`	`aa-disable {path to profile}`	Disable an AppArmor profile, unloading it from the kernel.	Lesson 12, Topic D
`aa-unconfined`	*No additional options or subcommands.*	List processes with open network sockets that don't have an AppArmor profile loaded.	Lesson 12, Topic D

Script Implementation Commands

Command	Syntax	Purpose	Covered in
`awk`	`awk [options] ['patterns {actions}'] | {file-names}`	Search for specified information, and take action when that information is found.	Lesson 13, Topic B
`sed`	`sed {'options/ address/action'} {file-names}`	Modify text files, especially by searching and replacing.	Lesson 13, Topic B
`find`	`find {where to search} {search criteria}`	Search for files based on criteria other than filename.	Lesson 13, Topic B
`tee`	`command [options] [arguments] | tee [options] {file-names}`	Verify the output of a command immediately, and store that output in a file for later reference.	Lesson 13, Topic B

Command	Syntax	Purpose	Covered in
`xargs`	`command [options] [arguments] | xargs [options] {command}`	Commonly used with the `find` command to operate on each result that is found within the file or directory search.	Lesson 13, Topic B
`export`	`export [options] [NAME[=value]]`	Set the value of an environment variable for all future Bash sessions.	Lesson 13, Topic C
`env`	`env [options] [NAME=value] [command]`	Run a command with modified environment variables.	Lesson 13, Topic C
`alias`	`alias [alias name[='command with options']]`	Customize the shell environment by generating command-line aliases.	Lesson 13, Topic C

IaC Commands

Command	Syntax	Purpose	Covered in
`git`	`git [options] {subcommand}`	Manage Git repositories.	Lesson 14, Topic C

Commands for Managing Containers

Command	Syntax	Purpose	Covered in
`docker`	`docker subcommand {options} {arguments}`	The primary management command for Docker containers.	Lesson 15, Topic B
`docker pull`	`docker pull {image-name}`	Pull an image from a registry.	Lesson 15, Topic B
`docker container`	`docker container subcommand {options} {arguments}`	Manage attributes for specified containers.	Lesson 15, Topic B
`push`	*Exact syntax depends on the specific container engine.*	Upload images to a registry.	Lesson 15, Topic B
`pull`	*Exact syntax depends on the specific container engine.*	Download images from a registry.	Lesson 15, Topic B

Linux Installation Commands

Command	Syntax	Purpose	Covered in
`mkinitrd`	`mkinitrd [options] {initrd image name} {kernel version}`	Create the initrd image for preloading the kernel modules.	Lesson 16, Topic A
`grub2-install`	`grub2-install [options] [device name]`	Install the GRUB2 boot loader on a storage device.	Lesson 16, Topic B
`grub2-mkconfig`	`grub2-mkconfig [-o {file name}]`	Generate a new grub.cfg configuration file, or update an existing one.	Lesson 16, Topic B