UBUNTU COMMANDS

REFERENCE GUIDE

Compiled by: Karma Dorji

The Essential Terminal Companion

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A detailed guide for Ubuntu/Linux users covering navigation, file management, system administration, and more.

1. Navigation & File Management

Directory Operations

Understanding where you are and what's around you is the first step in Linux navigation.

```
pwd                          # Print working directory (show current path)
ls                           # List files and directories
ls -l                        # Detailed list with permissions, size, and dates
ls -a                        # List all files including hidden ones
ls -la                       # Detailed list including hidden files
ls -lh                       # Human-readable file sizes (KB, MB, GB)
ls -t                        # Sort by modification time (newest first)
ls -R                        # List recursively (show subdirectory contents)

cd /path/to/directory        # Change to absolute path
cd                           # Change to home directory
cd ~                         # Change to home directory
cd ..                        # Move up one directory level
cd ../..                     # Move up two directory levels
cd -                         # Return to previous directory
```

File/Directory Creation & Deletion

```
mkdir directory_name         # Create a new directory
mkdir -p path/to/directory   # Create nested directories (parent directories if
needed)
mkdir dir1 dir2 dir3         # Create multiple directories at once

touch filename.txt           # Create empty file or update timestamp
touch file1.txt file2.txt    # Create multiple files

rm file.txt                  # Remove file
rm -i file.txt               # Remove with confirmation prompt
```

```
rm -f file.txt               # Force remove without confirmation
rm -r directory/             # Remove directory recursively
rm -rf directory/            # Force remove directory and contents (DANGEROUS!)
rmdir empty_dir/             # Remove empty directory only
```

Copying, Moving, and Renaming

```
cp source.txt destination/   # Copy file to directory
cp file1.txt file2.txt       # Copy and rename
cp -r source_dir/ dest_dir/  # Copy directory recursively
cp -v file.txt dest/         # Verbose mode (show what's being copied)

mv old.txt new.txt           # Rename file
mv file.txt directory/       # Move file to directory
mv -i file.txt dest/         # Interactive move (prompt before overwrite)
mv -v file.txt dest/         # Verbose move
rename 's/old/new/' *.txt    # Rename multiple files (change 'old' to 'new' in
filenames)
```

2. File Viewing & Editing

Viewing File Contents

```
cat filename.txt             # Display entire file content
cat -n filename.txt          # Display with line numbers
cat file1.txt file2.txt      # Concatenate multiple files

less filename.txt           # View file page by page (space: next page, b: previous
page, q: quit)
more filename.txt           # Similar to less but with fewer features

head filename.txt           # Show first 10 lines of file
head -n 20 filename.txt     # Show first 20 lines
head -c 100 filename.txt    # Show first 100 bytes

tail filename.txt           # Show last 10 lines of file
tail -n 20 filename.txt     # Show last 20 lines
```

```
tail -f logfile.txt          # Follow file in real-time (watch updates)

tail -F logfile.txt          # Follow file, even if it gets rotated
```

File Editors

```
nano filename.txt            # User-friendly terminal editor
# Nano shortcuts: Ctrl+O (Save), Ctrl+X (Exit), Ctrl+W (Search), Ctrl+K (Cut line)

vim filename.txt             # Advanced terminal editor
# Vim modes: i (insert), Esc (normal mode), :wq (save and quit), :q! (quit without
saving)


gedit filename.txt           # GUI text editor (if desktop environment available)
```

File Comparison & Search

```
diff file1.txt file2.txt     # Compare two files line by line
cmp file1.txt file2.txt      # Compare two files byte by byte

grep "pattern" file.txt      # Search for pattern in file
grep -i "pattern" file.txt   # Case-insensitive search
grep -r "pattern" dir/       # Recursive search in directory
grep -n "pattern" file.txt   # Show line numbers with matches
grep -v "pattern" file.txt   # Show lines NOT containing pattern

find /path -name "*.txt"     # Find files by name
find . -type f -size +1M     # Find files larger than 1MB

find /home -user username    # Find files owned by specific user
```

3. System Information & Monitoring

System Information

Getting to know your system's hardware and OS.

```
uname -a                    # Show all system information
uname -r                    # Show kernel version only
uname -m                    # Show machine architecture

lsb_release -a              # Show Ubuntu version details
cat /etc/os-release         # Show OS release information
hostnamectl                 # Show system hostname and related settings

lscpu                       # Detailed CPU information
lsmem                       # Memory information
lsblk                       # List block devices (disks and partitions)
lspci                       # List PCI devices

lsusb                       # List USB devices
```

Disk & Memory Usage

Checking resource consumption.

```
df -h                       # Show disk space in human-readable format
df -i                       # Show inode usage
du -sh directory/           # Show directory size in human-readable format
du -h --max-depth=1         # Show sizes of first-level subdirectories

free -h                     # Show memory usage in human-readable format
free -m                     # Show memory in MB
```

```
vmstat 1 10                 # Show virtual memory statistics every 1 second, 10
times
```

Process Management

```
ps aux                      # Show all running processes
ps -ef                      # Show full format listing
ps -u username              # Show processes for specific user

top                         # Interactive process viewer
htop                        # Enhanced top (if installed)
pstree                      # Show process tree

kill PID                    # Terminate process by PID
kill -9 PID                 # Force kill process
killall process_name        # Kill all processes with specified name
pkill pattern               # Kill processes by pattern

nice -n 10 command          # Run command with modified priority

renice 5 PID                # Change priority of running process
```

System Monitoring

Checking system status and user activity.

```
uptime                      # Show system uptime and load average
w                           # Show who is logged in and what they're doing
who                         # Show logged in users
last                        # Show last logged in users

dmesg                       # Display kernel ring buffer messages
```

```
dmesg | tail -20            # Show last 20 kernel messages

journalctl -f               # Follow system logs (systemd)

tail -f /var/log/syslog     # Follow system messages
```

4. Package Management with APT

Basic Package Operations

APT (Advanced Package Tool) is the primary package manager for Ubuntu.

```
sudo apt update             # Refresh package list from repositories
sudo apt upgrade            # Upgrade all installed packages
sudo apt full-upgrade       # Upgrade with dependency handling

sudo apt install package_name           # Install a package
sudo apt install pkg1 pkg2 pkg3         # Install multiple packages
sudo apt install package=version        # Install specific version

sudo apt remove package_name            # Remove package but keep configuration
files
sudo apt purge package_name             # Remove package and configuration files

sudo apt autoremove                     # Remove unused dependencies
```

Package Information & Search

```
apt list --installed        # List all installed packages
apt list --upgradable       # List packages that can be upgraded
apt show package_name       # Show detailed package information
```

```
apt search "keyword"          # Search for packages by keyword
apt-cache search pattern      # Alternative search method
apt depends package_name      # Show package dependencies
apt rdepends package_name     # Show reverse dependencies

dpkg -l                       # List all installed packages (DPKG method)
dpkg -L package_name          # List files installed by a package

dpkg -S /path/to/file         # Find which package owns a file
```

Package Maintenance

```
sudo apt autoclean            # Remove obsolete package files
sudo apt clean                # Remove all cached package files
sudo apt dist-upgrade         # Smart upgrade handling dependencies

sudo dpkg -i package.deb      # Install local .deb package

sudo dpkg -r package_name     # Remove .deb package
```

Snap Packages (Alternative)

```
snap find search_term         # Search for snap packages
snap install package_name     # Install snap package
snap list                     # List installed snap packages
snap refresh package_name     # Update snap package

snap remove package_name      # Remove snap package
```

5. File Permissions & Ownership

Understanding Permissions

```
Permission notation:
- rwx rwx rwx
  |   |   |
  |   |   └── Others (everyone else)
  |   └────── Group (members of file's group)
  └────────── Owner (file owner)

r = read (4), w = write (2), x = execute (1)
Examples:

755 = rwxr-xr-x (owner: rwx, group: r-x, others: r-x)
644 = rw-r--r-- (owner: rw-, group: r--, others: r--)
```

Permission Commands

```
chmod 755 filename          # Set permissions using octal notation
chmod u+x script.sh         # Add execute permission for owner
chmod g-w file.txt          # Remove write permission for group
chmod o-r file.txt          # Remove read permission for others
chmod a+r file.txt          # Add read permission for everyone

chown user:group file.txt   # Change owner and group
chown user file.txt         # Change owner only
chown :group file.txt       # Change group only
chown -R user:group dir/    # Recursively change ownership

chgrp groupname file.txt    # Change group ownership (alternative method)

ls -l                       # View permissions (first column shows permissions)

stat filename               # Show detailed file information including permissions
```

Special Permissions

```
chmod +s file               # Set SUID/SGID bits
```

```
chmod +t directory/          # Set sticky bit (only owner can delete files in
directory)

umask                        # Show current umask (default permissions mask)

umask 022                    # Set umask (default: 644 for files, 755 for
directories)
```

6. Networking Commands

Network Configuration & Information

```
ip addr show                 # Show network interfaces and IP addresses
ifconfig                     # Legacy command for interface configuration
ip route show                # Show routing table
ip link show                 # Show network links

ss -tuln                     # Show listening ports (modern replacement for netstat)
netstat -tuln                # Show listening ports (legacy)
netstat -r                   # Show routing table
netstat -i                   # Show network interfaces

lsof -i :80                  # Show processes using port 80

lsof -i tcp                  # Show all TCP connections
```

Connectivity Testing

```
ping google.com              # Test connectivity to host
ping -c 4 google.com         # Send 4 ping packets then stop
ping -I eth1 google.com      # Ping from specific interface
```

```
traceroute google.com       # Trace route to host
tracepath google.com        # Alternative traceroute

mtr google.com              # Combination of ping and traceroute (if installed)
```

Network Transfers

```
wget http://example.com/file.zip        # Download file from web
wget -c http://example.com/file.zip     # Continue interrupted download
wget -r http://example.com/             # Recursive download

curl http://example.com/file.zip -o file.zip    # Download with curl
curl -O http://example.com/file.zip     # Download with original filename
curl -I http://example.com/             # Show only HTTP headers

scp file.txt user@remote:/path/         # Secure copy to remote host
scp user@remote:/path/file.txt .        # Secure copy from remote host

rsync -av source/ destination/          # Synchronize directories

rsync -avz source/ user@remote:/path/   # Sync to remote host with compression
```

Network Troubleshooting

```
nslookup domain.com         # DNS lookup
dig domain.com              # Detailed DNS information
host domain.com             # Simple DNS lookup

whois domain.com            # WHOIS information for domain
iptables -L                 # List firewall rules (if using iptables)

ufw status                  # Check Uncomplicated Firewall status
```

7. User & Group Management

User Accounts

```
whoami                      # Show current username
id                          # Show user and group information
groups                      # Show groups current user belongs to

sudo adduser username       # Add new user with home directory
sudo useradd username       # Add new user (low-level command)
sudo deluser username       # Delete user
sudo usermod -aG groupname username    # Add user to group

passwd                      # Change current user's password
sudo passwd username        # Change another user's password

sudo visudo                 # Edit sudoers file safely
```

Group Management

```
sudo groupadd groupname     # Create new group
sudo groupdel groupname     # Delete group
cat /etc/group              # List all groups

getent group groupname      # Show group information
```

Session Management

```
su - username               # Switch user (with environment)
sudo -i                     # Switch to root user
sudo -u username command    # Run command as different user

logout                      # Log out of current session
```

```
exit                        # Exit current shell or session
```

8. Compression & Archives

Creating Archives

```
tar -czf archive.tar.gz directory/      # Create gzipped tar archive
tar -cjf archive.tar.bz2 directory/     # Create bzip2 compressed archive
tar -cJf archive.tar.xz directory/      # Create xz compressed archive

zip -r archive.zip directory/           # Create zip archive
```

Extracting Archives

```
tar -xzf archive.tar.gz                 # Extract gzipped tar archive
tar -xjf archive.tar.bz2                # Extract bzip2 archive
tar -xJf archive.tar.xz                 # Extract xz archive
unzip archive.zip                       # Extract zip archive

tar -tzf archive.tar.gz                 # List contents without extracting
```

File Compression

```
gzip filename               # Compress file (creates filename.gz)
gunzip filename.gz          # Decompress .gz file

bzip2 filename              # Compress with bzip2 (creates filename.bz2)
bunzip2 filename.bz2        # Decompress .bz2 file
```

```
xz filename                # Compress with xz (creates filename.xz)
unxz filename.xz           # Decompress .xz file
```

9. Advanced Utilities

Text Processing

```
sort file.txt              # Sort lines alphabetically
sort -n file.txt           # Sort numerically
sort -r file.txt           # Sort in reverse order

uniq file.txt              # Remove duplicate consecutive lines
uniq -c file.txt           # Count occurrences of lines

wc file.txt                # Count lines, words, and characters
wc -l file.txt             # Count lines only
wc -w file.txt             # Count words only

cut -d: -f1 /etc/passwd    # Extract first field using : delimiter
awk '{print $1}' file.txt  # Print first column using awk
sed 's/old/new/g' file.txt # Replace text using sed
```

System Administration

```
sudo systemctl start service_name      # Start a service
sudo systemctl stop service_name       # Stop a service
sudo systemctl restart service_name    # Restart a service
sudo systemctl status service_name     # Check service status
sudo systemctl enable service_name     # Enable service to start at boot
sudo systemctl disable service_name    # Disable service from starting at boot

crontab -l                  # List current user's cron jobs
```

```
crontab -e                  # Edit cron jobs
sudo crontab -e             # Edit root's cron jobs

sudo reboot                 # Restart system
sudo shutdown -h now        # Shutdown immediately

sudo shutdown -r +10        # Reboot in 10 minutes
```

Disk Operations

```
sudo fdisk -l               # List disk partitions
sudo blkid                  # Show block device attributes
sudo mount /dev/sda1 /mnt   # Mount filesystem
sudo umount /mnt            # Unmount filesystem
df -T                       # Show filesystem types

lsblk -f                    # Show filesystem information for block devices

sudo fsck /dev/sda1         # Check and repair filesystem
```

10. Help & Documentation

Getting Help

```
man command                 # Display manual page for command
man -k keyword              # Search manual pages by keyword
whatis command              # Brief description of command
which command               # Show path to command executable
whereis command             # Show binary, source, and manual page locations

command --help              # Show help for command
help command                # Help for shell builtins (bash)

info command                # Display info page (alternative to man)
```

```
tldr command                # Simplified man pages (if tldr installed)
```

Command History

```
history                     # Show command history
history 10                  # Show last 10 commands
!n                          # Execute command number n from history
!!                          # Repeat last command
!string                     # Execute last command starting with string

Ctrl + R                    # Search command history interactively

history -c                  # Clear command history
```

Shell Features

```
echo $PATH                  # Show PATH environment variable
export VAR=value            # Set environment variable
alias ll='ls -alF'          # Create command alias
unalias ll                  # Remove alias

type command                # Show what type of command it is (alias, builtin,
etc.)

time command                # Measure execution time of command
```