

Linux Cheatsheet

Essential commands for system administration and daily operations

This cheatsheet provides a quick reference to fundamental Linux commands, syntax, and advanced features, ideal for both beginners and experienced system administrators for efficient server management and automation.

System Information Display system status and hardware info	File Operations Create, modify, and manage files	Process Management Monitor and control running processes
Network Operations Configure and troubleshoot networking	Package Management Install, update, and remove software	

System Information & Status

System Information: `uname`

Display system information including kernel and architecture.

```
# Show kernel name
uname
# Show all system information
uname -a
# Show kernel version
uname -r
# Show architecture
uname -m
# Show operating system
uname -o
```

Hardware Information: `lscpu`, `lsblk`

View detailed hardware specifications and block devices.

```
# CPU information
lscpu
# Block devices (disks, partitions)
lsblk
# Memory information
free -h
# Disk usage by filesystem
df -h
```

System Uptime: `uptime`

Show system uptime and load averages.

```
# System uptime and load
uptime
# More detailed uptime information
uptime -p
# Show uptime since specific date
uptime -s
```

File & Directory Operations

Navigate, create, and manage files and directories effectively.

01	02	03
List Files: `ls` Display files and directories with various formatting options.	Navigate Directories: `cd`, `pwd` Change directories and display current location.	Create & Remove: `mkdir`, `rmdir`, `rm` Create and delete files and directories.
<pre># List files in current directory ls # Detailed listing with permissions ls -l # Show hidden files ls -la # Human-readable file sizes ls -lh # Sort by modification time ls -lt</pre>	<pre># Go to home directory cd # Go to specific directory cd /path/to/directory # Go up one level cd .. # Show current directory pwd # Go to previous directory cd -</pre>	<pre># Create directory mkdir newdir # Create nested directories mkdir -p path/to/nested/dir # Remove empty directory rmdir dirname # Remove file rm filename # Remove directory recursively rm -rf dirname</pre>

File Content & Manipulation

View File Contents: `cat`, `less`, `head`, `tail`

Display file contents using various methods and pagination.

```
# Display entire file
cat filename
# View file with pagination
less filename
# Show first 10 lines
head filename
# Show last 10 lines
tail filename
# Follow file changes in real-time
tail -f logfile
```

Copy & Move: `cp`, `mv`

Copy and move files and directories.

```
# Copy file
cp source.txt destination.txt
# Copy directory recursively
cp -r sourcedir/ destdir/
# Move/rename file
mv oldname.txt newname.txt
# Move to different directory
mv file.txt /path/to/destination/
# Copy with preservation of attributes
cp -p file.txt backup.txt
```

Process Management

Process Listing: `ps`

Display running processes and their details.

```
# Show user processes
ps
# Show all processes with details
ps aux
# Show process tree
ps -ef --forest
# Show processes by user
ps -u username
# Real-time process monitor
top
```

Kill Processes: `kill`, `killall`

Terminate processes by PID or name.

```
# Kill process by PID
kill 1234
# Force kill process
kill -9 1234
# Kill by process name
killall processname
# List all signals
kill -l
# Send specific signal
kill -HUP 1234
```

Network Operations

Configure networking, troubleshoot connections, and transfer data.

Network Configuration: `ip`, `ifconfig` Display and configure network interfaces.	Port & Connection Analysis: `netstat`, `ss` Display network connections and listening ports.
<pre># Show network interfaces ip addr show # Show routing table ip route show # Configure interface (temporary) ip addr add 192.168.1.10/24 dev eth0 # Bring interface up/down ip link set eth0 up # Legacy interface configuration ifconfig</pre>	<pre># Show all connections netstat -tln # Show listening ports netstat -tln grep LISTEN # Modern replacement for netstat ss -tln # Show processes using ports netstat -tulnp # Check specific port netstat -tln grep :80</pre>

Network Testing: `ping`, `traceroute`

Test network connectivity and trace packet routes.

```
# Test connectivity
ping google.com
# Ping with count limit
ping -c 4 192.168.1.1
# Trace route to destination
traceroute google.com
# MTR - network diagnostic tool
mtr google.com
```

Text Processing & Search

Manipulate text files and search for patterns efficiently.

Text Search: `grep` Search for patterns in files and command output.	Sort & Count: `sort`, `uniq`, `wc` Sort data, remove duplicates, and count lines, words, or characters.
<pre># Search for pattern in file grep "pattern" filename # Case-insensitive search grep -i "pattern" filename # Recursive search in directories grep -r "pattern" /path/ # Show line numbers grep -n "pattern" filename # Count matching lines grep -c "pattern" filename</pre>	<pre># Sort file contents sort filename # Sort numerically sort -n numbers.txt # Remove duplicate lines uniq filename # Sort and remove duplicates sort filename uniq # Count lines, words, characters wc filename # Count only lines wc -l filename</pre>

Text Manipulation: `sed`, `awk`

Edit and process text using stream editors and pattern scanners.

```
# Replace text in file
sed 's/old/new/g' filename
# Delete lines containing pattern
sed '/pattern/d' filename
# Print specific fields
awk 'sum $1, $3' filename
# Sum values in column
awk 'sum += $1' END {print sum}' filename
```

Archive & Compression

Create Archives: `tar`

Create and extract compressed archives.

```
# Create tar archive
tar -cf archive.tar files/
# Create compressed archive
tar -czf archive.tar.gz files/
# Extract archive
tar -xf archive.tar
# Extract compressed archive
tar -xzf archive.tar.gz
# List archive contents
tar -tf archive.tar
```

Compression: `gzip`, `zip`

Compress and decompress files using various algorithms.

```
# Compress file with gzip
gzip filename
# Decompress gzip file
gunzip filename.gz
# Create zip archive
zip archive.zip file1 file2
# Extract zip archive
unzip archive.zip
# List zip contents
unzip -l archive.zip
```

System Monitoring & Performance

Monitor system performance, resources, and troubleshoot issues.

Memory Usage: `free`, `vmstat` Monitor memory usage and virtual memory statistics.	System Load: `top`, `htop` Monitor system load, CPU usage, and running processes.
<pre># Memory usage summary free -h # Detailed memory stats cat /proc/meminfo # Virtual memory statistics vmstat # Memory usage every 2 seconds vmstat 2 # Show swap usage swapon --show</pre>	<pre># Real-time process monitor top # Enhanced process viewer htop # Show load averages uptime # Show CPU information lscpu # Monitor specific process top -p PID</pre>

Disk I/O: `iostat`, `iotop`

Monitor disk input/output performance and identify bottlenecks.

```
# I/O statistics (requires sysstat)
iostat
# I/O stats every 2 seconds
iostat 2
# Monitor disk I/O by process
iotop
# Show I/O usage for specific device
iostat -x /dev/sda
```

User & Permission Management

User Operations: `useradd`, `usermod`, `userdel` Create, modify, and delete user accounts.	Switch Users: `su`, `sudo` Switch users and execute commands with elevated privileges.
<pre># Add new user useradd username # Add user with home directory useradd -m username # Modify user account usermod -aG groupname username # Delete user account userdel username # Delete user with home directory userdel -r username</pre>	<pre># Switch to root user su - # Switch to specific user su - username # Execute command as root sudo command # Execute command as specific user sudo -u username command # Edit sudoers file visudo</pre>

Group Management: `groupadd`, `groups`

Create and manage user groups.

```
# Create new group
groupadd groupname
# Show users's groups
groups username
# Show all groups
cat /etc/group
# Add user to group
usermod -aG groupname username
# Change user's primary group
usermod -g groupname username
```

Package Management

Install, update, and manage software packages across different distributions.

APT (Debian/Ubuntu): `apt`, `apt-get` Manage packages on Debian-based systems.	Snap Packages: `snap` Install and manage snap packages across distributions.
<pre># Update package list apt update # Upgrade all packages apt upgrade # Install package apt install packagename # Remove package apt remove packagename # Search for packages apt search packagename # Show package information apt show packagename</pre>	<pre># Install snap package snap install packagename # List installed snaps snap list # Update snap packages snap refresh # Remove snap package snap remove packagename # Search for snap packages snap find packagename</pre>

YUM/DNF (RHEL/Fedora): `yum`, `dnf`

Manage packages on Red Hat-based systems.

```
# Install package
yum install packagename
# Update all packages
yum update
# Remove package
yum remove packagename
# Search for packages
yum search packagename
# List installed packages
yum list installed
```

Shell & Scripting

Command History: `history`

Access and manage command line history.

```
# Show command history
history
# Show last 10 commands
history 10
# Execute previous command
!!
# Execute command by number
!123
# Search history interactively
Ctrl+R
```

Aliases & Functions: `alias`

Create shortcuts for frequently used commands.

```
# Create alias
alias ll='ls -la'
# Show all aliases
alias
# Remove alias
unalias ll
# Make alias permanent (add to .bashrc)
echo "alias ll='ls -la'" >> ~/.bashrc
```

System Installation & Setup

Distribution Options: Ubuntu, CentOS, Debian Choose and install Linux distributions for different use cases.	Boot & Installation: USB, Network Create bootable media and perform system installation.	Initial Configuration: Users, Network, SSH Set up basic system configuration after installation.
<pre># Ubuntu Server wget ubuntu-server.iso # CentOS Stream wget centos-stream.iso # Debian Linux wget debian.iso # Verify ISO integrity sha256sum linux.iso</pre>	<pre># Create bootable USB (Linux) dd if=linux.iso of=/dev/sdX bs=4M # Create bootable USB (cross-platform) # Use tools like Rufus, Etcher, or UNetbootin # Network installation # Configure PXE boot for network installs</pre>	<pre># Set hostname hostnamectl set-hostname newname # Configure static IP # Edit /etc/netplan (Ubuntu) or /etc/network/interfaces # Enable SSH service systemctl enable ssh # Configure firewall ufw enable ufw allow ssh</pre>

Security & Best Practices

Implement security measures and follow system administration best practices.

Firewall Configuration: `ufw`, `iptables` Configure firewall rules to protect system from network threats.	System Updates: Security Patches Keep system secure with regular updates and security patches.
<pre># Enable UFW firewall ufw enable # Allow specific port ufw allow 22/tcp # Allow service by name ufw allow ssh # Deny access ufw deny 23 # Show firewall status ufw status verbose # Advanced rules with iptables iptables -L</pre>	<pre># Ubuntu security updates apt update && apt upgrade # Automatic security updates unattended-upgrades # CentOS/RHEL updates yum update --security # List available updates apt list --upgradable</pre>

File Integrity: `checksums`

Verify file integrity and detect unauthorized changes.

```
# Generate MD5 checksum
md5sum filename
# Generate SHA256 checksum
sha256sum filename
# Verify checksum
sha256sum -c checksums.txt
# Create checksum file
sha256sum *.txt > checksums.txt
```

Troubleshooting & Recovery

Diagnose and resolve common Linux system issues.

Boot Issues: GRUB Recovery Recover from boot loader and kernel problems.	Service Issues: `systemctl` Diagnose and fix service-related problems.
<pre># Boot from rescue mode # Access GRUB menu during boot # Mount root filesystem mount /dev/sda1 /mnt # Chroot into system chroot /mnt # Reinstall GRUB grub-install /dev/sda # Update GRUB configuration update-grub</pre>	<pre># Check service status systemctl status servicename # View service logs journalctl -u servicename # Restart failed service systemctl restart servicename # Enable service at boot systemctl enable servicename # List failed services systemctl --failed</pre>

File System Repair: `fsck`

Check and repair file system corruption.

```
# Check file system
fsck /dev/sda1
# Force file system check
fsck -f /dev/sda1
# Automatic repair
fsck -y /dev/sda1
# Check all mounted filesystems
fsck -A
```

<pre># Check disk space df -h # Monitor I/O usage iotop # Check memory usage free -h # Identify CPU usage top # List open files lsof</pre>
--

<pre># Monitor authentication logs tail -f /var/log/auth.log # Check failed login attempts grep "Failed password" /var/log/auth.log # Monitor system logs tail -f /var/log/syslog # View login history last # Check for suspicious activities journalctl -p err</pre>

Reference

This cheatsheet covers essential Linux commands and modern practices for efficient system administration, server management, and automation in production environments.