Comprehensive list of Linux commands

Here’s a comprehensive list of Linux commands with descriptions and examples. This list covers most commonly used commands for file management, system monitoring, networking, and more.

File and Directory Operations

1. `ls` - List directory contents

- Example:

```
ls -l /home  # List files in /home with details
```

2. `cd` - Change directory

- Example:

```
cd /var/log  # Move to /var/log directory
```

3. `pwd` - Print working directory

- Example:

```
pwd  # Show current directory path
```

4. `mkdir` - Create a directory

- Example:

```
mkdir new_folder  # Create a directory named new_folder
```

5. `rmdir` - Remove an empty directory

- Example:

```
rmdir empty_folder  # Remove empty_folder
```

6. `rm` - Remove files or directories

- Example:

```
rm file.txt  # Delete file.txt
rm -r folder  # Recursively delete folder and its contents
```

7. `cp` - Copy files or directories

- Example:

```
cp file.txt /backup  # Copy file.txt to /backup
cp -r folder /backup  # Copy folder recursively
```

8. `mv` - Move or rename files or directories

- Example:

```
mv file.txt /backup  # Move file.txt to /backup
mv old_name.txt new_name.txt  # Rename file
```

9. `touch` - Create an empty file or update file timestamp

- Example:

```
touch newfile.txt  # Create newfile.txt
```

10. `cat` - Display file content

- Example:

```
cat file.txt  # Show content of file.txt
```

11. `more` - View file content page by page

- Example:

```
more largefile.txt  # View largefile.txt page by page
```

12. `less` - View file content with backward navigation

- Example:

```
less largefile.txt  # View file with backward navigation
```

13. `head` - Display the first part of a file

- Example:
-

```
head -n 10 file.txt  # Show first 10 lines of file.txt
```

14. `tail` - Display the last part of a file

- Example:

```
tail -n 10 file.txt  # Show last 10 lines of file.txt
tail -f logfile.log  # Follow logfile.log in real-time
```

15. `find` - Search for files or directories

- Example:

```
find /home -name "*.txt"  # Find all .txt files in /home
```

16. `grep` - Search text using patterns

- Example:

```
grep "error" logfile.log  # Search for "error" in logfile.log
```

17. `tar` - Archive files

- Example:

```
tar -cvf archive.tar folder  # Create archive.tar from folder
tar -xvf archive.tar  # Extract archive.tar
```

18. `zip` / `unzip` - Compress and extract files

- Example:

```
zip archive.zip file.txt  # Compress file.txt into archive.zip
unzip archive.zip  # Extract archive.zip
```

19. `chmod` - Change file permissions

- Example:

```
chmod 755 script.sh  # Set permissions to rwxr-xr-x
```

20. `chown` - Change file ownership

- Example:

```
chown user:group file.txt  # Change owner and group of file.txt
```

System Monitoring and Management

1. `ps` - Display running processes

- Example:

```
ps aux  # Show all running processes
```

2. `top` - Display real-time system stats

- Example:

```
top  # Show live system stats
```

3. `htop` - Interactive process viewer (requires installation)

- Example:

```
htop  # Interactive system monitoring
```

4. **`kill`** - Terminate a process

- Example:

```
kill 1234  # Terminate process with PID 1234
kill -9 1234  # Forcefully terminate process
```

5. **`df`** - Display disk space usage

- Example:

```
df -h  # Show disk usage in human-readable format
```

6. **`du`** - Display directory space usage

- Example:

```
du -sh /home  # Show total size of /home
```

7. **`free`** - Display memory usage

- Example:

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

8. **`uname`** - Display system information

- Example:

```
uname -a  # Show all system information
```

9. **`uptime`** - Show system uptime

- Example:

```
uptime  # Display how long the system has been running
```

10. `shutdown` - Shutdown or restart the system

- Example:

```
shutdown now  # Shutdown immediately
shutdown -r now  # Restart immediately
```

Networking

1. `ping` - Test network connectivity

- Example:

```
ping google.com  # Ping Google
```

2. `ifconfig` - Configure or display network interfaces

- Example:

```
ifconfig  # Show network interfaces
```

3. `ip` - Advanced network configuration

- Example:

```
ip addr show  # Display IP addresses
```

4. `netstat` - Display network connections

- Example:

```
netstat -tuln  # Show listening ports
```

5. `ssh` - Connect to a remote server

- Example:

```
ssh user@192.168.1.1  # SSH into a remote server
```

6. **`scp`** - Securely copy files between hosts

- Example:

```
scp file.txt user@192.168.1.1:/home  # Copy file.txt to remote server
```

7. **`wget`** - Download files from the web

- Example:

```
wget https://example.com/file.zip  # Download file.zip
```

8. **`curl`** - Transfer data from or to a server

- Example:

```
curl -O https://example.com/file.zip  # Download file.zip
```

9. **`nslookup`** - Query DNS records

- Example:

```
nslookup google.com  # Lookup DNS for google.com
```

10. **`dig`** - DNS lookup utility

- Example:

```
dig google.com  # Query DNS information for google.com
```

User and Permission Management

1. **`useradd`** - Add a new user

- Example:

```
useradd john  # Create a new user named john
```

2. **`passwd`** - Change user password

- Example:

```
passwd john  # Set password for user john
```

3. **`usermod`** - Modify user account

- Example:

```
usermod -aG sudo john  # Add john to sudo group
```

4. **`userdel`** - Delete a user

- Example:

```
userdel john  # Delete user john
```

5. **`groupadd`** - Add a new group

- Example:

```
groupadd developers  # Create a new group named developers
```

6. **`groupdel`** - Delete a group

- Example:

```
groupdel developers  # Delete group developers
```

7. **`su`** - Switch user

- Example:

```
su john  # Switch to user john
```

8. **`sudo`** - Execute commands as superuser

- Example:

```
sudo apt update  # Run apt update as superuser
```

Package Management

1. **`apt`** - Package manager for Debian-based systems

- Example:

```
sudo apt update  # Update package list
sudo apt install nginx  # Install nginx
```

2. **`yum`** - Package manager for RHEL-based systems

- Example:

```
sudo yum install httpd  # Install Apache on RHEL
```

3. **`dnf`** - Modern package manager for Fedora

- Example:

```
sudo dnf install nginx  # Install nginx on Fedora
```

4. **`pacman`** - Package manager for Arch Linux

- Example:

```
sudo pacman -S nginx  # Install nginx on Arch
```

Miscellaneous

1. `echo` - Display a line of text

- Example:

```
echo "Hello, World!"  # Print "Hello, World!"
```

2. `date` - Display or set the system date and time

- Example:

```
date  # Show current date and time
```

3. `history` - Display command history

- Example:

```
history  # Show command history
```

4. `man` - Display manual pages

- Example:

```
man ls  # Show manual for ls command
```

5. `alias` - Create command shortcuts

- Example:

```
alias ll='ls -la'  # Create alias for ls -la
```

6. `cron` - Schedule tasks

- Example:

```
crontab -e  # Edit cron jobs
```

7. `ln` - Create links between files

- Example:

```
ln -s /path/to/file link_name  # Create symbolic link
```

8. **`diff`** - Compare files line by line

- Example:

```
diff file1.txt file2.txt  # Compare two files
```

This list covers most of the essential Linux commands.