Basic Linux Quick Reference

Terminal, Bash, programs, packages and systemd

Almost every command explains itself with `-help` or `man`. Use `Tab` to complete names and `Ctrl-r` to search command history.

1. Terminal and Files

Orientation

`pwd`	Current directory
`whoami`	Current user
`hostname`	Show host name
`clear`	Clear terminal
`man cp`	Manual for cp
`cp -help`	Show short help

Navigate and List

`ls -lah`	Hidden files and readable sizes
`cd /etc`	Change to `/etc`
`cd ..`	One level up
`cd -`	Previous directory
`cd ~`	Home directory
`find . -maxdepth 2`	List two levels deep

Files and Directories

`mkdir -p log/old`	Create directories
`touch test.txt`	Create empty file
`cp -a config backup/`	Copy, preserve attributes
`mv old.txt new.txt`	Move / rename
`rm -rI build/`	Recursive, safer prompt
`ln -s target link`	Create symbolic link

View, Edit, Archives

`less /var/log/syslog`	Read file page by page
`head -n 20 file`	First 20 lines
`tail -f app.log`	Follow file live
`nano file / vim file`	Edit text file
`tar -czf logs.tgz log/`	Create compressed archive
`tar -xzf logs.tgz`	Extract archive

Permissions and Ownership

`ls -l file`	Show permissions and owner
`chmod u+x script.sh`	Make executable for owner
`chmod 640 config`	Owner rw, group r
`sudo chown root:root file`	Change owner and group

Targets and Timers

`systemctl get-default`	Default boot target
`systemctl list-units -type=target`	List active targets
`sudo systemctl set-default multi-user.target`	Text mode as default
`sudo systemctl isolate rescue.target`	Switch to rescue mode now
`systemctl list-timers -all`	All timers and next runs

2. Search, Processes and Bash

Pipes and Redirections

`cmd > out.txt`	Overwrite output file
`cmd >> out.txt`	Append output
`cmd 2> error.log`	Redirect errors
`cmd1 | cmd2`	Pipe output to next command
`make && ./app`	Second command only on success
`test -f x || touch x`	Second command only on failure

Search and Process Text

`grep -Rni TODO src/`	Recursively search for TODO
`find . -name '*.log'`	Find files by name
`grep ERROR app.log`	Show matching lines
`sort names | uniq -c`	Sort and count duplicates
`wc -l *.c`	Count lines
`sed -n '10,20p' file`	Print lines 10 to 20

Processes and System

`ps aux`	Show all processes
`top / htop`	Watch processes live
`pgrep -af iperf3`	Find process by name
`kill PID`	Terminate process normally
`kill -9 PID`	Last resort only
`df -h / du -sh *`	Filesystem / directories
`free -h / uname -a`	Memory / kernel information

Network and Remote Systems

`ip -br address`	Interfaces and IP addresses
`ping -c 4 1.1.1.1`	Test reachability
`curl -I https://example.com`	Fetch HTTP headers
`ssh pi@192.168.1.20`	Open remote shell
`scp file pi@host:/tmp/`	Copy file over SSH

Packages with APT

`sudo apt update`	Refresh package lists
`sudo apt upgrade`	Upgrade installed packages
`sudo apt install tree`	Install package
`sudo apt remove tree`	Remove package
`apt search serial`	Search packages
`apt show iperf3`	Show package details

Other distributions use e.g. `dnf` or `pacman`.

Bash, History and Key Tricks

`name=Philipp`	Set shell variable
`echo "$name"`	Safely expand variable
`today=$(date +%F)`	Insert command output
`export EDITOR=vim`	Export variable to programs
`alias ll='ls -lah'`	Define shortcut
`history | grep ssh`	Search history for ssh
`Ctrl-r / !! / !$`	Search / last command / last argument
`Ctrl-a / Ctrl-e`	Start / end of line

3. Services, Logs and Diagnosis

Control Services

`systemctl status ssh.service`	Status and recent messages
`sudo systemctl start ssh.service`	Start now
`sudo systemctl stop ssh.service`	Stop now
`sudo systemctl restart NetworkManager.service`	Restart service
`sudo systemctl enable ssh.service`	Enable at boot
`sudo systemctl disable ssh.service`	Disable autostart
`sudo systemctl enable -now my-app.service`	Enable and start now

`start` = changes only the current runtime state. `enable` = configures future boot startup.

Failures and Logs

`systemctl -failed`	Show failed units
`journalctl -u ssh.service`	Logs for one service
`journalctl -u my-app.service -b`	Service since current boot
`journalctl -b`	All logs since boot
`journalctl -f`	Follow new messages live
`journalctl -p warning..alert -b`	Only important messages

Units and Service Files

`systemctl list-units -type=service`	List loaded services
`systemctl list-unit-files`	Installed unit files
`systemctl cat my-app.service`	Show effective unit file
`sudo systemctl edit -full my-app.service`	Edit service file
`sudo systemctl daemon-reload`	Reload unit files
`sudo systemctl restart my-app.service`	Apply change

Typical Troubleshooting

`systemctl status my-app.service`	Check error, exit code and path
`journalctl -u my-app.service -n 50`	Last 50 messages
`systemctl cat my-app.service`	User, Exec-Start and dependencies
`systemd-analyze verify my-app.service`	Verify unit syntax
`command -v my-app`	Find program in search path
`ss -lntup`	Listening ports and processes