50 Essential Linux Commands for DevOps Engineers

The Complete Cheat Sheet

File and Directory Operations

Command	Syntax	Purpose
ls	ls -la	List files with details and permissions
cd	cd /path or cd ~	Change directory or go to home directory
pwd	pwd	Print current working directory
mkdir	mkdir -p /path/to/dir	Create directories recursively
cp	cp -r source dest	Copy files/directories recursively
mv	mv old new	Move or rename files
rm	rm -rf /path	Remove files/directories forcefully
find	find /path -name "*.log"	Search files by pattern
locate	locate filename	Quick file search (uses index)
which	which command	Find executable location

Process Management

Command	Syntax	Purpose
ps	ps aux	Show all running processes
top	top	Real-time process monitor
htop	htop	Enhanced interactive process viewer
kill	kill -9 PID	Force terminate a specific process
killall	killall nginx	Kill all processes by name
pkill	pkill -f "pattern"	Kill processes by matching a pattern
nohup	nohup command &	Run command in background (ignores hangup)
jobs	jobs	Show background jobs
systemctl	systemctl restart service	Manage system services (start, stop, restart)

Log Analysis

Command	Syntax	Purpose
journalctl	journalctl -u nginx	View logs for a specific systemd service
journalctl	journalctl -f	Follow systemd logs in real-time
dmesg	dmesg | tail	View latest kernel ring buffer messages
logger	logger "Custom message"	Write custom messages to system log

System Monitoring

Command	Syntax	Purpose
df	df -h	Show disk usage in human-readable format
du	du -h /path	Show directory size
free	free -h	Display memory usage
iostat	iostat -x 2	I/O statistics every 2 seconds
sar	sar -u	System activity report
vmstat	vmstat 2	Virtual memory statistics every 2 seconds
lscpu	lscpu	Display CPU information
uptime	uptime	Show system uptime and load averages
whoami	whoami	Show current user

Permissions and Ownership

Command	Syntax	Purpose
chmod	chmod 755 file	Change file or directory permissions
chown	chown user:group file	Change file owner and group
chgrp	chgrp group file	Change group ownership
umask	umask 022	Set default permission mask

Network Operations

Command	Syntax	Purpose
netstat	netstat -tuln	Show listening ports
ss	ss -tlnp	Modern replacement for netstat
curl	curl -I https://site.com	Test HTTP endpoints (headers only)
wget	wget -O file.tar.gz URL	Download files from a URL
ping	ping -c 4 google.com	Test network connectivity
traceroute	traceroute google.com	Trace the path to a remote server
dig	dig google.com MX	DNS lookup queries (e.g., MX records)
nslookup	nslookup google.com	DNS resolution

Archive and Compression

Command	Syntax	Purpose
tar	tar -czf backup.tar.gz /path	Create a compressed .tar.gz archive
tar	tar -xzf backup.tar.gz	Extract files from a .tar.gz archive
gzip	gzip file.txt	Compress a single file
gunzip	gunzip file.txt.gz	Decompress a .gz file
zip	zip -r archive.zip /path	Create a ZIP archive
unzip	unzip archive.zip	Extract files from a ZIP archive

Text Processing

Command	Syntax	Purpose
grep	grep -r "ERROR" /var/log	Search text patterns recursively
awk	awk '{print $1}' file	Process and print specific columns of data
sed	sed 's/old/new/g' file	Stream editor for find-and-replace in text
sort	sort -n file	Sort lines numerically
uniq	uniq -c file	Remove duplicates and count occurrences
wc	wc -l file	Count lines, words, and characters
head	head -n 20 file	Show first N lines of a file
tail	tail -f file	Follow file changes in real time
cut	cut -d',' -f2 file.csv	Extract specific column using delimiter
tr	tr '[:lower:]' '[:upper:]'	Transform characters (e.g., lower to upper)

Advanced Operations

Command	Syntax	Purpose
crontab	crontab -e	Edit user’s scheduled cron jobs
at	at now + 1 hour	Schedule a one-time task
rsync	rsync -av src/ dest/	Sync files/directories efficiently
scp	scp file user@host:/path	Securely copy files over SSH
ssh	ssh user@hostname	Secure remote shell session
sudo	sudo command	Execute command as another user (root)
su	su - user	Switch to another user
mount	mount /dev/sdb1 /mnt	Mount filesystem to directory
umount	umount /mnt	Unmount mounted filesystem

Essential Command Combinations

Purpose	Command Combination
Find large files	find / -size +100M -type f -exec ls -lh {} \;
Monitor real-time logs	tail -f /var/log/app.log | grep ERROR
Top CPU processes	ps aux --sort=-%cpu | head -10
Top memory processes	ps aux --sort=-%mem | head -10
Find open files by process	lsof -p PID
Network connections	ss -tuln | grep :80
Disk usage by directory	du -h /var/log | sort -hr
Count files in directory	find /path -type f | wc -l
Remove old files	find /tmp -mtime +7 -delete
Backup with timestamp	tar -czf backup-$(date +%Y%m%d).tar.gz /data

Permission Quick Reference

Permission	Octal	Binary	Meaning
---	0	0	No permissions
--x	1	1	Execute only
-w-	2	10	Write only
-wx	3	11	Write and execute
r--	4	100	Read only
r-x	5	101	Read and execute
rw-	6	110	Read and write
rwx	7	111	Read, write, and execute

Common Port Numbers

Port	Service	Protocol
22	SSH	TCP
53	DNS	TCP/UDP
80	HTTP	TCP
443	HTTPS	TCP
3306	MySQL	TCP
5432	PostgreSQL	TCP
6379	Redis	TCP
8080	Alternative HTTP	TCP
9200	Elasticsearch	TCP