Engineer’s Journey

Project 1: Linux Essentials (v1)

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Linux Essentials

Here’s a practical and focused list of essential Linux commands that systems engineers and DevOps pros use daily, along with examples for each.

Linux is the essential part of the DevOps, Cloud, Platform, Systems & SRE engineering. It is the core that we start our journey in. So make sure to get comfortable with Linux before proceeding to other parts of the course.

Follow along the guide. Remember not to copy & paste. Run the commands manually so you can get used to them.

File & Directory Management

Command	Description	Example
`ls`	List directory contents	`ls -al /var/log`
`cd`	Change directory	`cd /etc/nginx`
`pwd`	Print working directory	`pwd`
`mkdir`	Create directory	`mkdir /opt/myapp`
`rm`	Remove files/directories	`rm -rf /tmp/test`
`cp`	Copy files/directories	`cp file1.txt /backup/`
`mv`	Move/rename files	`mv old.log archive.log`
`find`	Search for files	`find / -name "*.conf"`

File Content & Editing

Command	Description	Example
`cat`	Show file content	`cat /etc/os-release`
`less` / `more`	Scroll through file content	`less /var/log/syslog`
`head` / `tail`	Show start or end of file	`tail -f /var/log/syslog`
`nano` / `vim`	Terminal-based file editor	`vim /etc/hosts`
`touch`	Create empty file	`touch test.txt`

🧠 System Info

Command	Description	Example
`uname -a`	Kernel and system info	`uname -a`
`hostname`	Display hostname	`hostname`
`uptime`	Show system uptime	`uptime`
`top / htop`	Live system resource monitor	`top`
`free -h`	Memory usage	`free -h`
`df -h`	Disk usage	`df -h`
`du -sh`	Directory size	`du -sh /var/log`

⚙️ Permissions & Ownership

Command	Description	Example
chmod	Change permissions	chmod +x script.sh
chown	Change file owner	chown user:group file.txt
ls -l	View permissions	ls -l /etc/passwd

👤 User & Process Management

Command	Description	Example
`ps aux`	Show all processes	`` `ps aux ``
`kill` / `killall`	Kill processes by PID or name	`kill 1234`, `killall nginx`
`adduser` / `useradd`	Add a user	`adduser john`
`passwd`	Change password	`passwd john`
`id`	View UID and groups	`id john`
`whoami`	Show current user	`whoami`

Networking

Command	Description	Example
`ip a`	Show IP addresses	`ip a`
`ss -tuln`	Show listening ports	`ss -tuln`
`ping`	Test connectivity	`ping 8.8.8.8`
`curl`	HTTP request	`curl -I https://google.com`
`wget`	Download file	`wget https://example.com/file.zip`
`traceroute`	Trace route to host	`traceroute google.com`
`dig / nslookup`	DNS lookups	`dig google.com`

🔐 System Services (systemd)

Command	Description	Example
`systemctl status`	View service status	`systemctl status nginx`
`systemctl start/stop`	Start/stop a service	`systemctl start docker`
`systemctl enable/disable`	Enable service on boot	`systemctl enable ssh`
`journalctl -u`	View logs for service	`journalctl -u nginx`

📦 Package Management

Ubuntu/Debian (apt)

Command	Description	Example
`apt update`	Update package list	`apt update`
`apt upgrade`	Upgrade packages	`apt upgrade -y`
`apt install`	Install package	`apt install nginx`
`apt remove`	Uninstall package	`apt remove nginx`

CentOS/RHEL (yum/dnf)

Command	Description	Example
`yum install`	Install package	`yum install httpd`
`yum update`	Update packages	`yum update -y`

📁 Compression & Archiving

Command	Description	Example
`tar -czf`	Create .tar.gz	`tar -czf backup.tar.gz /etc`
`tar -xzf`	Extract .tar.gz	`tar -xzf backup.tar.gz`
`zip / unzip`	Compress/extract zip	`zip -r logs.zip /var/log`

🧪 Miscellaneous

Command	Description	Example
`crontab -e`	Edit cron jobs	`crontab -e`
`env`	Show environment vars	`env`
`export`	Set env var	`export FOO=bar`
`alias`	Shortcut command	`alias ll='ls -alF'`

🔄 File Sync, Backups & Archiving

Command	Description	Example
`rsync`	Efficiently copy/sync files locally or remotely	`rsync -avz /data/ user@server:/backup/`
`scp`	Secure copy over SSH	`scp file.txt user@server:/tmp/`
`sftp`	Secure FTP interactive session	`sftp user@host` then `put file.txt`
`dd`	Low-level disk copying	`dd if=/dev/sda of=/dev/sdb bs=4M`
`cp -a`	Copy files recursively with permissions	`cp -a /home/user /mnt/backup/`

🔗 Symlinks, Hardlinks, Mounting

Command	Description	Example
`ln -s`	Create a symbolic link	`ln -s /opt/myapp/config.yaml /etc/myapp/config.yaml`
`ln`	Create a hard link	`ln /var/log/syslog /tmp/syslog_link`
`mount`	Mount filesystem or device	`mount /dev/sdb1 /mnt/usb`
`umount`	Unmount device	`umount /mnt/usb`
`df -h`	Show mounted filesystems with usage	`df -h`
`lsblk`	List block devices	`lsblk`
`blkid`	Show block device UUIDs	`blkid`

📦 Archive Extraction Utilities

Command	Description	Example
`tar`	Extract tar archives	`tar -xvf archive.tar`
`gzip` / `gunzip`	Compress/decompress `.gz`	`gzip file.txt`, `gunzip file.txt.gz`
`xz` / `unxz`	Compress/decompress `.xz`	`xz file.txt`, `unxz file.txt.xz`
`7z`	Use 7-zip (if installed)	`7z x archive.7z`

QUESTIONS???

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