**Linux Cheat Sheet for Cloud & DevOps Engineer**

* 1. **Linux Directory Structure**

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| Directory | Description |
| / | Root directory |
| /bin | Essential user binaries |
| /sbin | System binaries |
| /etc | All system Configuration files |
| /dev | Device files |
| /proc | Virtual filesystem for kernel and process information |
| /var | Variable data files (logs, databases) |
| /tmp | Temporary files |
| /home | User home directories |
| /boot | Boot loader files |
| /mnt | Mount point for temporary mounts |
| /opt | Optional application software packages for 3rd party |
| /media | Mount point for removable media |

* 1. **User and Group Management**

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| Command | Description | Example |
| useradd <username> | Add a new user | useradd test |
| adduser <username> | Add a new user with home directory | adduser test1 |
| passwd <username> | Set user password | passwd test |
| userdel <username> | Delete a user | userdel test |
| passwd -l <username> | Lock a user account | passwd -l test |
| passwd -u <username> | Unlock a user account | passwd -u test |
| usermod -l <new> <old> | Rename a user | usermod -l test2 test |
| groupadd <groupname> | Add a new group | groupadd IT |
| groupdel <groupname> | Delete a group | groupdel IT |
| usermod -aG <group> <user> | Add user to group | usermod -aG IT test |

1. **File and Directory Operations**

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| Command | Description | Example |
| ls | List directory contents | ls |
| ls -l | List with detailed information | ls -l |
| pwd | Print working directory | pwd |
| cd <dir name> | Change directory | cd /home |
| mkdir <dir name> | Create a new directory | mkdir newfolder |
| rm <file name> | Remove a file | rm file.txt |
| rmdir <dir name> | Remove an empty directory | rmdir newfolder |
| touch <file name> | Create an empty file | touch newfile.txt |
| cp <src> <dest> | Copy a file or directory | cp file.txt /backup/ |
| mv <dir src> <dir dest> | Move or rename a file or directory | mv oldname.txt newname.txt |
| cat <file name> | Concatenate and display file content | cat file.txt |
| head <file name> | Display the first 10 lines of a file | Head -10 file.txt |
| tail <file name> | Display the last 10 lines of a file | tail -10 file.txt |
| vi <file name> | Open file in vi editor | vi file.txt |
| vim <file name> | Open file in vim editor | vim file.txt |

1. **File Permissions**

In Linux, file permissions can be represented using octal (base-8) numbers, where each digit corresponds to a specific set of permissions for:

* User (Owner), Group and Others

Each permission type has a corresponding numeric value:

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| Permission | Symbol | Value |
| Read | r | 4 |
| Write | w | 2 |
| Execute | x | 1 |

We add the values to get the total permission:

* rwx = 4 + 2 + 1 = **7**
* rw- = 4 + 2 = **6**
* r-- = 4 = **4**
* --- = 0

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| Command | Description | Example |
| chmod <mode> <file> | Change file permissions | chmod 444 file.txt |
| chown <user>:<group> <file> | Change file owner and group | chown test:IT file.txt |

* + 1. **Process Management**

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| Command | Description | Example |
| ps | Display current processes | ps |
| ps aux | Detailed process information | ps aux |
| ps -ef | Full-format listing of all processes | ps -ef |
| kill <pid> | Terminate a process | kill 1234 |
| kill -9 <pid> | Forcefully terminate a process | kill -9 1234 |
| kill -STOP <pid> | Pause a process | kill -STOP 1234 |
| kill -CONT <pid> | Resume a paused process | kill -CONT 1234 |

* + 1. **System Information and Monitoring**

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| Command | Description | Example |
| uname | Shows system information | uname -a |
| hostnamectl | Displays or sets system hostname info | hostnamectl |
| uptime | Shows how long the system has been running | uptime |
| whoami | Shows the current logged-in user | whoami |
| lscpu | Displays CPU architecture details | lscpu |
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| top | Display task manager | top |
| htop | Interactive process viewer | htop |
| free -h | Display memory usage | free -h |
| df -h | Display disk space usage | df -h |
| du -sh <dir> | Display directory size | du -sh /home/user |
| vmstat | Report virtual memory statistics | vmstat |
| nproc | Show number of processing units | nproc |
| top | Display task manager | top |

* + 1. **Networking**

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| Command | Description | Example |
| ip a | Display IP addresses | ip a |
| ifconfig | Configure network interfaces | ifconfig |
| ping <host> | Send ICMP echo requests | ping google.com |
| traceroute <host> | Trace route to a network host | traceroute google.com |
| nslookup <domain> | Query DNS records | nslookup google.com |
| curl <url> | Transfer data from or to a server | curl http://example.com |
| wget <url> | Download files from the web | wget http://example.com/file.zip |
| dig | Queries DNS name servers | dig google.com |
| ssh | Secure remote login | ssh user@192.168.1.10 |
| scp | Securely copy files between systems | scp file.txt user@192.168.1.10:/home/user/ |
| ftp | Connects to FTP server | ftp ftp.example.com |

1. **Disk Management**

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| Command | Description | Example |
| lsblk | List information about block devices | Lsblk |
| fdisk -l | List disk partitions | fdisk -l |
| mkfs.ext4 <device> | Create ext4 filesystem | mkfs.ext4 /dev/sdb1 |
| mount <device> <dir> | Mount a filesystem | mount /dev/sdb1 /mnt/data |
| umount <dir> | Unmount a filesystem | umount /mnt/data |
| sudo nano /etc/fstab | Edit filesystem table for persistent mounts | sudo nano /etc/fstab |

1. **Search and Text Processing**

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| Command | Description | Example |
| grep <pattern> <file> | Search for a pattern in a file | grep 'error' log.txt |
| find <dir> -name <name> | Search for files in a directory hierarchy | find /home -name '\*.txt' |

1. **Archiving & Compression**

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| Command | Description | Example |
| tar | Archive files into .tar format | tar -cvf archive.tar file1 file2 |
| gzip | Compress a file into .gz format | gzip file.txt |
| gunzip | Decompress a .gz file | gunzip file.txt.gz |
| xz | Compress a file into .xz format | xz file.txt |
| unxz | Decompress a .xz file | unxz file.txt.xz |
| zip | Compress into .zip archive | zip archive.zip file1 file2 |
| unzip | Extract files from a .zip archive | unzip archive.zip |

1. **Package Management**

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| Command | Description | Example |
| apt-get | Installs/removes packages (Debian/Ubuntu) | sudo apt-get install nginx |
| yum | Installs/removes packages (RHEL/CentOS) | sudo yum install httpd |