DevOps Shack

Linux Commands Documentation

1. Introduction to Linux

Linux is an open-source operating system that manages hardware and software resources on a computer. It provides a user interface and a range of utilities to perform system tasks.

2. Basic Linux Commands

These commands are fundamental and are used to perform basic operations.

- `pwd`: Print Working Directory
  ```
  pwd
  ```
- `ls`: List directory contents
- ```
  ls
  ```
- ```
  ls -l   # long format
  ls -a   # all files including hidden
  ```
- `cd`: Change Directory
- ```
  cd /path/to/directory
  ```
- ```
  cd ~     # home directory
  cd ..    # parent directory
  ```

3. File Management Commands

These commands help in creating, deleting, copying, and moving files.

- `touch`: Create an empty file
  ```
  touch filename
  ```
- `cp`: Copy files or directories
- ```
  cp source destination
  ```

```
          cp -r source_directory destination_directory
```
- **mv**: Move or rename files or directories
```
mv old_name new_name
mv source destination
```
- **rm**: Remove files or directories
```
rm filename
rm -r directory_name
```

4. Text Processing Commands

These commands are used to manipulate text files.

- **cat**: Concatenate and display file content
```
cat filename
```
- **grep**: Search text using patterns
```
grep "pattern" filename
```
- **sed**: Stream editor for filtering and transforming text
```
sed 's/old/new/g' filename
```
- **awk**: Pattern scanning and processing language
```
awk '{print $1}' filename
```

5. User Management Commands

Manage users and groups on the system.

- **adduser**: Add a new user
```
sudo adduser username
```
- **deluser**: Delete a user
```
sudo deluser username
```
- **usermod**: Modify a user
```
sudo usermod -aG groupname username
```

6. Network Commands

Commands to manage and troubleshoot network settings.

- **ifconfig**: Configure a network interface
```
ifconfig
```
- **ping**: Send ICMP ECHO_REQUEST to network hosts
```
ping google.com
```
- **netstat**: Network statistics
```
netstat -an
```
- **ssh**: Secure Shell
```
ssh user@hostname
```

7. System Monitoring Commands

Monitor system performance and status.

- **top**: Display Linux tasks
  ```
  top
  ```
- **htop**: Interactive process viewer
  ```
  htop
  ```
- **ps**: Report a snapshot of current processes
  ```
  ps aux
  ```
- **df**: Report file system disk space usage
  ```
  df -h
  ```
- **du**: Estimate file space usage
  ```
  du -sh directory_name
  ```

8. Package Management Commands

Manage software packages.

- **apt-get**: APT package handling utility (Debian-based)
- `sudo apt-get update`
- `sudo apt-get install package_name`
  `sudo apt-get remove package_name`
- **yum**: Package manager (RHEL-based)
- `sudo yum update`
- `sudo yum install package_name`
  `sudo yum remove package_name`

9. Disk Management Commands

Commands to manage disk partitions and usage.

- **fdisk**: Partition table manipulator
  ```
  sudo fdisk -l
  ```
- **mkfs**: Build a Linux file system
  ```
  sudo mkfs.ext4 /dev/sdX1
  ```
- **mount**: Mount a file system
  ```
  sudo mount /dev/sdX1 /mnt
  ```
- **umount**: Unmount file system
  ```
  sudo umount /mnt
  ```

10. Shell Scripting Basics

Automate tasks using shell scripts.

- **Creating a simple script**

- ```
  #!/bin/bash
  echo "Hello, World!"
  ```

- **Running a script**

- ```
  chmod +x script_name.sh
  ```

```
    ./script_name.sh
```

- **Variables**

```
name="John"
echo "Hello, $name"
```

- **Conditional Statements**

```
if [ condition ]
then
   # commands
fi
```

- **Loops**

```
for i in {1..5}
do
   echo "Iteration $i"
done
```

11. Advanced File Management

Commands for advanced file and directory manipulation.

- `find`: Search for files in a directory hierarchy
  ```
  find /path/to/search -name "filename"
  find /path/to/search -type f -size +100M
  ```
- `locate`: Find files by name
  ```
  locate filename
  ```
- `ln`: Create links between files
  ```
  ln -s /path/to/original /path/to/symlink
  ```
- `tar`: Archive files
- `tar -cvf archive.tar /path/to/directory`
- `tar -xvf archive.tar`
- `tar -czvf archive.tar.gz /path/to/directory`
  ```
  tar -xzvf archive.tar.gz
  ```
- `zip` and `unzip`: Compress and decompress files
- `zip archive.zip filename`
  ```
  unzip archive.zip
  ```

12. Process Management

Commands to manage running processes.

- `kill`: Terminate a process by PID
  ```
  kill PID
  ```
- `killall`: Terminate all processes by name
  ```
  killall process_name
  ```
- `pkill`: Kill processes by name
  ```
  pkill process_name
  ```

- **bg**: Resume a suspended job in the background
  ```
  bg %job_number
  ```
- **fg**: Resume a job in the foreground
  ```
  fg %job_number
  ```
- **nohup**: Run a command immune to hangups
  ```
  nohup command &
  ```

13. Permission Management

Commands to manage file and directory permissions.

- **chmod**: Change file mode (permissions)
- ```
  chmod 755 filename
  chmod u+x filename
  ```
- **chown**: Change file owner and group
  ```
  sudo chown owner:group filename
  ```
- **chgrp**: Change group ownership
  ```
  sudo chgrp group filename
  ```

14. Disk Quotas

Commands to manage disk quotas.

- **quota**: Display disk usage and limits
  ```
  quota -u username
  ```
- **edquota**: Edit user quotas
  ```
  sudo edquota -u username
  ```
- **repquota**: Report on disk quotas
  ```
  sudo repquota /filesystem
  ```

15. Backup and Restore

Commands to perform system backups and restores.

- **rsync**: Remote file and directory synchronization
- ```
  rsync -av /source/directory /destination/directory
  rsync -avz /source/directory user@remote:/destination/directory
  ```
- **dd**: Convert and copy a file
- ```
  dd if=/dev/sdX of=/path/to/backup.img
  dd if=/path/to/backup.img of=/dev/sdX
  ```

16. System Maintenance

Commands to perform system maintenance tasks.

- **fsck**: File system consistency check and repair
  ```
  sudo fsck /dev/sdX
  ```
- **tune2fs**: Adjust tunable file system parameters

```
sudo tune2fs -l /dev/sdX
```
- **e2fsck**: Check a Linux ext2/ext3/ext4 file system
```
sudo e2fsck /dev/sdX
```

17. Kernel Management

Commands to manage the Linux kernel.

- **uname**: Print system information
```
uname -a
```
- **dmesg**: Print or control the kernel ring buffer
```
dmesg | less
```
- **modprobe**: Add and remove modules from the Linux kernel
- ```
  sudo modprobe module_name
  sudo modprobe -r module_name
  ```

18. Security Management

Commands to enhance system security.

- **ufw**: Uncomplicated Firewall
- ```
  sudo ufw enable
  ```
- ```
  sudo ufw status
  sudo ufw allow from 192.168.1.0/24
  ```
- **iptables**: Administration tool for IPv4 packet filtering
- ```
  sudo iptables -L
  ```
- ```
  sudo iptables -A INPUT -p tcp --dport 22 -j ACCEPT
  sudo iptables -A INPUT -p tcp --dport 80 -j ACCEPT
  ```

19. Advanced Text Processing

Further text processing commands for advanced users.

- **tr**: Translate or delete characters
```
echo "hello" | tr 'a-z' 'A-Z'
```
- **sort**: Sort lines of text files
```
sort filename
```
- **uniq**: Report or omit repeated lines
```
uniq filename
```
- **wc**: Print newline, word, and byte counts for each file
```
wc filename
```

20. Miscellaneous Commands

Various useful commands for different tasks.

- **alias**: Create an alias for a command
  ```
  alias ll='ls -la'
  ```
- **uptime**: Tell how long the system has been running
  ```
  uptime
  ```
- **who**: Show who is logged on
  ```
  who
  ```
- **date**: Display or set the system date and time
  ```
  date
  ```
- **cal**: Display a calendar
  ```
  cal
  ```
- **history**: Display the command history
  ```
  history
  ```