**1. Networking Commands**

**1.1 Monitoring System Resources**

* **top** – Displays real-time information about system processes, CPU, and memory usage.
  + top -u root – Show processes for the root user.
  + top -p <PID> – Monitor a specific process by its Process ID (PID).
* **ps** – Displays information about running processes.
  + ps aux --sort=-%mem | head – Show top processes sorted by memory usage.
  + ps -ef – Full format listing of processes.
  + ps -u pk – Show processes owned by the user pk.

**1.2 Network Connectivity**

* **ping** – Tests connectivity to a host.
  + ping google.com – Sends continuous ping requests.
  + ping -c 10 google.com – Sends 10 packets and stops.
  + ping -i 5 google.com – Sends packets every 5 seconds.
  + ping -s 32 google.com – Sends packets of 32 bytes.
  + ping -t 100 google.com – Sets the time-to-live for packets.

**1.3 DNS Queries**

* **nslookup** – Queries DNS to resolve domain names.
  + nslookup google.com – Get the IP address of Google.
  + nslookup -type=MX google.com – Fetch mail exchange records.
  + nslookup -type=A google.com – Get the IP address.
  + nslookup -type=TXT google.com – Fetch TXT records.
  + nslookup -query=ANY google.com – Retrieve all DNS records.

**1.4 Network Configuration**

* **ifconfig** – Displays network interfaces and configurations.
  + ifconfig – Show active network interfaces.
  + ifconfig -a – Show all interfaces, including inactive ones.
  + sudo ifconfig eth0 up – Enable the eth0 interface.

**1.5 File Transfers & HTTP Requests**

* **curl** – Transfers data from URLs.
  + curl http://google.com – Fetch the webpage content.
  + curl -o google.txt http://google.com – Save the output to a file.
  + curl -I http://google.com – Get only the headers.
  + curl -L http://google.com – Follow redirects.
  + curl -v http://google.com – Show verbose output.

**1.6 Network Monitoring**

* **tcpdump** – Captures network traffic.
  + sudo tcpdump -i any – Capture packets on all interfaces.
  + sudo tcpdump -i any -c 10 – Capture 10 packets and stop.
* **iperf** – Tests network bandwidth.
  + iperf -s – Start Iperf in server mode.
  + iperf -s -f M – Display results in Megabytes per second (MB/s).

**2. User Management Commands**

**2.1 User and Group Management**

* **Add Users:**
  + sudo adduser uktry – Create a user uktry with a home directory.
  + sudo useradd -m uktry – Alternative command for adding a user.
  + sudo passwd uktry – Set password for the user uktry.
* **Switch Users:**
  + sudo su - uktry – Switch to uktry user with the environment loaded.
  + su - pk – Switch to pk user.
* **Delete Users:**
  + sudo userdel -r pk – Remove the user pk and their home directory.
  + sudo userdel -rf pk – Force delete the user and their files.
* **Manage Groups:**
  + sudo groupadd c406cohort – Create a group c406cohort.
  + sudo usermod -aG c406cohort uktry – Add uktry to the group.
  + cat /etc/group | grep c406cohort – Verify group membership.

**2.2 File and Directory Permissions**

* **Change Permissions:**
  + sudo chmod 755 /home/uktry – Set read, write, and execute for owner, and read-execute for others.
  + sudo chmod g+s /home/grouptry/utk/a – Set the SGID bit for group ownership inheritance.
* **Ownership:**
  + sudo chown uktry:c406cohort /home/grouptry – Change ownership of a directory.

**2.3 System Information and Monitoring**

* **Memory Usage:**
  + free -h – Show memory usage in human-readable format.
  + free -m – Display memory in MB.
  + free -g – Display memory in GB.
  + free -t – Show total memory (RAM + Swap).
  + free -s 5 – Refresh memory stats every 5 seconds.
* **Disk Space:**
  + df -h – Display disk space usage in human-readable format.
* **File Details:**
  + ls -lrt – List files sorted by modification time.
  + stat google.txt – Show detailed information about the file.
  + cat google.txt – Display file contents.

**3. Jenkins Setup Commands**

**3.1 Install Java (Required for Jenkins)**

sudo apt update

sudo apt install fontconfig openjdk-17-jre -y

java -version

**3.2 Add Jenkins Repository & Install Jenkins**

1. **Add Jenkins Key and Repository:**

curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io-2023.key | sudo tee /usr/share/keyrings/jenkins-keyring.asc > /dev/null

echo "deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] https://pkg.jenkins.io/debian-stable binary/" | sudo tee /etc/apt/sources.list.d/jenkins.list > /dev/null

1. **Install Jenkins:**

sudo apt update

sudo apt install jenkins -y

**3.3 Manage Jenkins Service**

* **Start Jenkins:**

sudo systemctl start jenkins

* **Enable Jenkins at Boot:**

sudo systemctl enable jenkins

* **Check Jenkins Status:**

sudo systemctl status jenkins

**3.4 Access Jenkins**

1. Open browser:

http://localhost:8080

1. Retrieve Initial Admin Password:

sudo cat /var/lib/jenkins/secrets/initialAdminPassword

**3.5 Troubleshooting Jenkins**

* **Check Logs:**

sudo cat /var/log/jenkins/jenkins.log | grep -i "error"

* **Restart Jenkins:**

sudo systemctl restart jenkins

Here's the updated Word document content, including the SSH key setup for GitHub.

**4. SSH Key Setup for GitHub**

**4.1 Generate SSH Key Pair**

Create an SSH key pair for secure GitHub access:

ssh-keygen -t rsa -b 4096 -C "utkarsh.kumar1403@gmail.com"

* **-t rsa**: Specifies the RSA key type.
* **-b 4096**: Sets key length to 4096 bits (strong encryption).
* **-C**: Adds a label (usually your email) for identification.

**4.2 Add SSH Key to SSH Agent**

Start the SSH agent and add your private key:

eval "$(ssh-agent -s)"

ssh-add ~/.ssh/id\_rsa

**4.3 Add SSH Key to GitHub**

1. Copy the public key:

cat ~/.ssh/id\_rsa.pub

1. Go to **GitHub → Settings → SSH and GPG keys**.
2. Click **New SSH Key**, paste the key, and save.

**4.4 Verify GitHub Connection**

Test the SSH connection:

ssh -T git@github.com

Expected output:

Hi lazor! You've successfully authenticated, but GitHub does not provide shell access.