Cheat Sheet for comprehensive CompTIA Linux+

File Management

Navigation

- `pwd`: Print working directory.

- `cd`: Change directory.

- `cd ..`: Move up one directory.

- `cd ~`: Move to home directory.

- `cd -`: Move to previous directory.

Listing Files

- `ls`: List files and directories.

- `ls -l`: Long listing format.

- `ls -a`: Show hidden files.

- `ls -lh`: Human-readable file sizes.

Creating Files and Directories

- `touch`: Create an empty file.

- `mkdir`: Create a directory.

- `mkdir -p dir1/dir2`: Create nested directories.

Copying, Moving, and Deleting

- `cp`: Copy files and directories.

- `cp file1 file2`: Copy `file1` to `file2`.

- `cp -r dir1 dir2`: Recursively copy `dir1` to `dir2`.

- `mv`: Move or rename files and directories.

- `mv file1 file2`: Rename `file1` to `file2`.

- `mv file1 dir/`: Move `file1` to `dir/`.

- `rm`: Remove files and directories.

- **`rm file1`**: Delete `file1`.

- **`rm -r dir1`**: Recursively delete `dir1`.

- **`rm -f file1`**: Force delete `file1`.

File Permissions

Viewing Permissions
- **`ls -l`**: List files with permissions.

Changing Permissions
- **`chmod`**: Change file permissions.

  - **`chmod 755 file1`**: Set `rwxr-xr-x` permissions.

  - **`chmod u+x file1`**: Add execute permission for the owner.

  - **`chmod o-r file1`**: Remove read permission for others.

Changing Ownership
- **`chown`**: Change file owner.

  - **`chown user1 file1`**: Change owner to `user1`.

  - **`chown user1:group1 file1`**: Change owner and group.

- **`chgrp`**: Change file group.

  - **`chgrp group1 file1`**: Change group to `group1`.

Processes and System Monitoring

Viewing Processes
- **`ps`**: Display current processes.

  - **`ps aux`**: Detailed process listing.

- **`top`**: Real-time process monitoring.

- **`htop`**: Interactive process viewer (requires installation).

Managing Processes
- **`kill`**: Terminate a process.

  - **`kill PID`**: Kill process with ID `PID`.

  - **`kill -9 PID`**: Force kill process.

- `**pkill**`: Kill processes by name.

  - `**pkill process_name**`: Kill all processes named `process_name`.

System Monitoring
- `**free**`: Display memory usage.

  - `**free -h**`: Human-readable memory usage.

- `**df**`: Display disk space usage.

  - `**df -h**`: Human-readable disk space usage.

- `**du**`: Display disk usage of files and directories.

  - `**du -sh dir1**`: Summary of disk usage for `dir1`.

Package Management

Debian-based Systems (e.g., Ubuntu)
- `**apt-get**`: Package management tool.

  - `**apt-get update**`: Update package list.

  - `**apt-get upgrade**`: Upgrade installed packages.

  - `**apt-get install package_name**`: Install a package.

  - `**apt-get remove package_name**`: Remove a package.

Red Hat-based Systems (e.g., CentOS)
- `**yum**`: Package management tool.

  - `**yum update**`: Update package list.

  - `**yum upgrade**`: Upgrade installed packages.

  - `**yum install package_name**`: Install a package.

  - `**yum remove package_name**`: Remove a package.

Networking

Network Configuration
- `**ifconfig**`: Display network interfaces.

- `**ip**`: Display and manipulate routing, devices, policy routing, and tunnels.

- **`ip addr show`**: Show IP addresses.

- **`ip route show`**: Show routing table.

Network Utilities

- **`ping`**: Test network connectivity.

- **`ping host`**: Ping `host`.

- **`traceroute`**: Trace the route to a host.

- **`traceroute host`**: Trace route to `host`.

- **`netstat`**: Display network connections, routing tables, interface statistics, masquerade connections, and multicast memberships.

- **`netstat -tuln`**: Show listening TCP and UDP ports.

User and Group Management

User Management

- **`useradd`**: Add a new user.

- **`useradd -m user1`**: Create home directory for `user1`.

- **`userdel`**: Delete a user.

- **`userdel -r user1`**: Delete user and home directory.

- **`passwd`**: Change user password.

- **`passwd user1`**: Change password for `user1`.

Group Management

- **`groupadd`**: Add a new group.

- **`groupadd group1`**: Create `group1`.

- **`groupdel`**: Delete a group.

- **`groupdel group1`**: Delete `group1`.

- **`usermod`**: Modify user account.

- **`usermod -aG group1 user1`**: Add `user1` to `group1`.

Shell Scripting

Basic Script Structure

```
#!/bin/bash
# This is a comment
echo "Hello, World!"
```

Variables

- `variable_name=value`: Assign a value to a variable.

- `echo $variable_name`: Print the value of a variable.

Conditional Statements

```
if [ condition ]; then
  # commands
elif [ another_condition ]; then
  # commands
else
  # commands
fi
```

Loops

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

System Logging

Viewing Logs

- `cat /var/log/syslog`: View system logs.

- `tail -f /var/log/syslog`: Monitor logs in real-time.

Log Rotation

- `logrotate`: Manage log file rotation.

  - `/etc/logrotate.conf`: Configuration file for log rotation.

Backup and Restore

Backup

- `tar`: Archive files and directories.

- **`tar -cvf backup.tar dir1`**: Create a tar archive of `dir1`.

- **`tar -czvf backup.tar.gz dir1`**: Create a compressed tar archive.

Restore

- **`tar -xvf backup.tar`**: Extract files from a tar archive.

- **`tar -xzvf backup.tar.gz`**: Extract files from a compressed tar archive.

Security

Firewall Management

- **`ufw`**: Uncomplicated Firewall (Ubuntu).

- **`ufw enable`**: Enable the firewall.

- **`ufw allow 22`**: Allow SSH traffic.

- **`ufw deny 80`**: Deny HTTP traffic.

SSH Configuration

- **`/etc/ssh/sshd_config`**: SSH daemon configuration file.

- **`Port 22`**: Change SSH port.

- **`PermitRootLogin no`**: Disable root login.

Miscellaneous

Cron Jobs

- **`crontab -e`**: Edit cron jobs.

- **`* * * * * command`**: Run `command` every minute.

- **`0 5 * * * command`**: Run `command` at 5 AM every day.

System Information

- **`uname -a`**: Display system information.

- **`lsb_release -a`**: Display distribution information.

Text Manipulation

- **`grep`**: Search for patterns in files.

- **`grep pattern file`**: Search for `pattern` in `file`.

- **`sed`**: Stream editor for filtering and transforming text.

- **`sed 's/old/new/g' file`**: Replace `old` with `new` in `file`.

- **`awk`**: Pattern scanning and processing language.

- **`awk '{print $1}' file`**: Print the first column of `file`.

Tips and Tricks

- **Tab Completion**: Use `Tab` to auto-complete commands and filenames.

- **History**: Use `Ctrl+R` to search command history.

- **Aliases**: Create aliases in `~/.bashrc` for frequently used commands.

- **`alias ll='ls -la'`**: Create an alias for `ls -la`.

- **Help**: Use `man command` to view the manual page for a command.

- **`man ls`**: View the manual page for `ls`.

Example Commands

Example 1: Backup and Compress a Directory

```
tar -czvf backup.tar.gz /home/user/important_files
```

Example 2: Install a Package and Start a Service

```
sudo apt-get install apache2
sudo systemctl start apache2
```

Example 3: Create a User and Set Password

```
sudo useradd -m newuser
sudo passwd newuser
```

Example 4: Monitor Network Traffic

```
sudo tcpdump -i eth0
```

Example 5: Schedule a Cron Job

```
crontab -e
0 5 * * * /home/user/backup_script.sh
```

This cheat sheet covers the essential commands and concepts for the CompTIA Linux+ certification, providing a quick reference for common tasks and operations in a Linux environment.

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