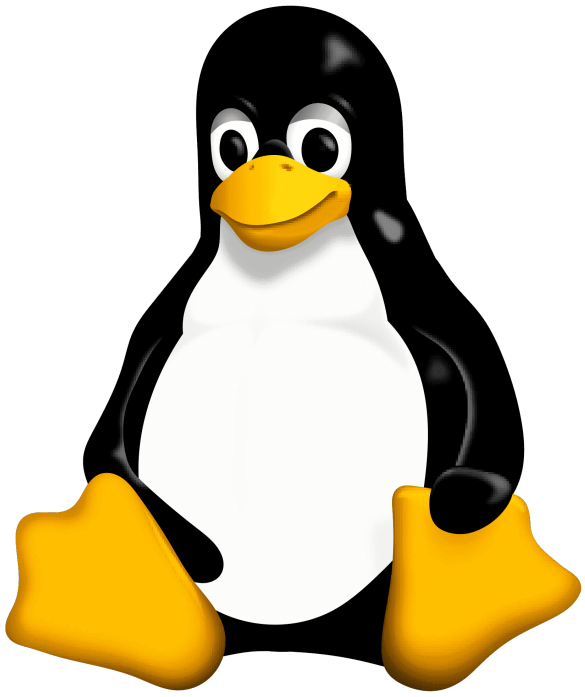
Basic Linux



Access the Linux Basics Handbook here.

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Users in Linux

- **Regular User:** Home directory
- **Root User:** Full access [ADMIN] (the superuser of the system)
- **Service User:** Service access (for servers)

> **Note:**
> If a regular user gains root access, they can use `sudo` before any command to utilize root privileges.
> To get full root access, use the `sudo su` command.

Text Editors

Vim

Vim is a popular text editor in Linux. Common commands include:

- **I:** Enter insert mode
- **esc:** Exit insert mode
- **:wq:** Exit and save changes
- **:q!:** Exit without saving changes

Basic File System

- **/bin:** Basic programs (e.g., `ls`, `cd`, `mv`)
- **/sbin:** System programs (e.g., `fdisk`, `sysctl`, `mkfs`)
- **/etc:** Configuration files (default values)
- **/temp:** Temporary files
- **/usr/bin:** Applications (e.g., `apt`, `nmap`)
- **/usr/share:** Application support and data files
- **/home:** Personal directories of users
- **/root:** Home directory of the superuser [ADMIN]

Paths in Linux

Below is an example of a directory structure:

```
Desktop
├── IntelliJ idea.desktop
├── Joshi
├── Kushal
│   ├── Birthday
│   └── Happy
│       └── hero.txt
├── Prasad
│   ├── Hello
│   └── Sir
├── firefox-esr.desktop
└── libreoffice-startcenter.desktop
```

> **Note:**
>
> - `gedit cd /Desktop/Kushal/Happy/hero.txt` is an absolute path (accessible from anywhere).
> - `gedit hero.txt` is a relative path (requires you to be in the `Happy` directory, for example).

Terminal Shortcuts

- **Tab:** Autocomplete names
- **Double Tab:** Open selection menu
- **Ctrl + C:** Abort the current process
- **Ctrl + L:** Clear the terminal (same as running `clear`)
- **Ctrl + D:** Exit the terminal (same as the `exit` command)
- **Ctrl + Alt + D:** Minimize all terminals/commands (toggle)
- **Ctrl + U:** Clear the current line
- **Ctrl + Z:** Suspend the current process to the background
- **Ctrl + A:** Move the cursor to the beginning of the line
- **Ctrl + E:** Move the cursor to the end of the line
- **Shift + Ctrl + C:** Copy text in the terminal
- **Shift + Ctrl + V:** Paste text in the terminal

Basic Linux Commands

Introducing Commands

- **help:** Shows basic commands and their uses.
- **man:** Displays the complete manual for a command or program.
- **ls:** Lists all files and folders in a directory.
  - `ls -a` shows hidden files and folders.
  - `ls -l` displays permissions, dates, and user/group information.
  - `ls -R` lists directories recursively.
- **cd:** Change directory.
- **pwd:** Show the present working directory.

- **clear:** Clear the terminal screen.
- **history:** Displays the history of commands.
- **echo / printf:** Print text to the terminal.
- **mkdir:** Create a new directory.

> **Note:**
>
> - Prepend a filename with a dot (e.g., `.Kushal`) to make it hidden.
> - Use `cd ..` to move up one directory.
> - To create a directory with spaces, use quotes (e.g., `mkdir "Kushal Prasad Joshi"`) or escape the spaces (e.g., `mkdir Kushal\ Prasad\ Joshi`).

Working With Directories

- **dir:** Same as `ls`.
- **mkdir:** Create a directory.
- **cp:** Copy a file or folder.
- **mv:** Move a file or folder.
- **rm:** Remove (delete) a file or folder.
  - Use `rm -r folder` to remove directories recursively.

Working With Files

- **sudo su root:** Grant root privileges.
- **cat:** Display the contents of a file.
- **nano:** Command-line text editor.
- **gedit:** Graphical text editor.
- **chmod:** Change file or directory permissions.
  - Example: `chmod +wxr filename` adds permissions, while `chmod -wxr filename` removes them.

> **Note:**
> In newer Linux versions, you can often use `sudo su` instead of `sudo su root`.

Chmod Calculator

- **Usage:**

  ```
  chmod filename ch-number
  ```

  Changes file permissions based on the given numeric mode.
- **Change Group:**
  Use the `chgroup` command as needed.

> **Note:**
> The format for permissions is typically Owner, Group, Public.

Executing Software

- **./filename:** Execute a shell file.
- **bash filename:** Run a shell script.
- **apt-get update:** Update the packages list.
- **apt-get upgrade:** Upgrade all installed software.
- **apt-get install software_name:** Install specific software.
- **apt-get update software_name:** Update packages for a particular software.
- **apt-get upgrade software_name:** Upgrade a particular software.

> **Note:**
>
> - `apt-get update` refreshes the package store.
> - `apt-get upgrade` updates all packages and tools.
> - In newer Linux distributions, the `apt` command is often used in place of `apt-get`.

Process Manipulation

- **top:** Displays processes consuming the most resources.
- **ps:** Shows the current processes.
  - `ps -a` includes background processes.
- **kill:** Terminate a process manually.
- **w:** Shows who is logged on and what they are doing.
- **whoami:** Displays the current user's username.
- **touch:** Create an empty file.

> **Note:**
>
> - Use `kill PID` to terminate a process by its process ID (PID).
> - `Ctrl + C` can stop an ongoing process in the terminal.

Changing Hostname

1. Gain root access:

```
sudo su
```

2. Navigate to the configuration directory:

```
cd /etc
```

3. Edit the hostname file:

```
gedit hostname
```

4. Restart the system:

```
reboot
```

Changing Domain Name

1. Gain root access:

```
sudo su
```

2. Navigate to the configuration directory:

```
cd /etc
```

3. Edit the hosts file:

```
gedit hosts
```

4. Start the Apache server:

```
service apache2 start
```

5. Access your domain by entering your IP address and port (e.g., `Kushal:80`) in a browser.

Configuring Apache Server

1. Start the Apache server:

```
service apache2 start
```

2. Navigate to the web directory:

```
cd /var/www/html/
```

3. Edit the index page:

```
sudo gedit index.html
```

> **Note:**
> Use `ifconfig` to find your IP address (e.g., `inet 192.168.78.141`).
> Apache typically runs on port 80 by default.

Changing Apache Port

1. Navigate to the configuration directory:

```
cd /etc/apache2
```

2. Edit the ports configuration file:

```
gedit ports.conf
```

   Change the port number (e.g., from 80 to 8080).
3. Restart Apache:

```
service apache2 restart
```

4. Verify by accessing your IP with the new port (e.g., `192.168.78.141:8080`).

Software Installation Without Apt

From Debian Files

1. Navigate to the Downloads folder:

```
cd Downloads
```

2. Install the package:

```
dpkg -i filename
```

From GitHub

1. Clone the repository:

```
git clone url
```

2. Navigate to the folder:

```
cd folder
```

3. Execute the file:

```
./exefile
```

> **Note:**
> Always follow the installation instructions provided on GitHub for best results.

Error Resolving in Linux Apt

Check for Root Access

- Ensure you have root privileges by using `sudo su`.

Check Your Connection

- Verify that you are connected to the internet.

Editing the Sources List

1. Navigate to the apt configuration directory:

```
cd /etc/apt
```

2. Edit the sources list:

```
gedit sources.list
```

   Make sure that important lines are not commented out (lines starting with `#`).
3. Update the package list:

```
apt update
```

Using Fix-Broken

```
apt-get install --fix-broken
```

Removing the Apt List

```
rm -rf /var/lib/apt/list/*
apt-get update
```

Running Multiple Commands in a Single Terminal

Semicolon (;)

- The second command will run regardless of the success of the first command.
  Example:

  ```
  cd ; ls
  ```

And (&&)

- The second command runs only if the first command is successful.
  Example:

  ```
  cd && ls
  ```

Or (||)

- The second command runs only if the first command fails.
  Example:

  ```
  cd || ls
  ```

License

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