



Linux Directories Structure & Explanation

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```
/
├─ bin      # User Binaries
├─ sbin     # System Binaries
├─ etc      # Configuration Files
├─ var      # Variable Files
│   └─ log  # Log directories
├─ tmp      # Temporary Files
├─ usr      # User Programs
│   └─ bin   # Non-essential user binaries
│   └─ sbin  # Non-essential system binaries
│   └─ local # Local hierarchy
│   └─ share # Architecture-independent data
├─ home     # Home Directories
│   └─ [username] # User's personal directory
├─ boot     # Boot Loader Files
├─ lib      # System Libraries
├─ opt      # Optional add-on Applications
├─ dev      # Device Files
├─ proc     # Process Information
├─ sys      # System Files
├─ media    # Mount directory for removable devices
└─ mnt      # General mount point
```



The Linux file system is organized in a hierarchical structure, starting from the root directory (/). Below is a detailed explanation of the key directories within a typical Linux file system, their uses, and examples of what you might find in each.

1. / - Root Directory

Everything on your Linux system is located under the root directory, even if they are stored on different physical or virtual devices. This is the top-level directory of the file system.

2. /bin - User Binaries

Contains binary executables that are essential for the system's operation, available to all users. For example, `ls`, `cp`, `mv`, `cat`, etc.

- **Example:** `/bin/ls` - Lists directory contents.

3. /sbin - System Binaries

Like `/bin`, this directory holds essential binaries, but these are generally intended for system administration purposes, used by the root user.

- **Example:** `/sbin/reboot` - Reboots the system.

4. /etc - Configuration Files

Contains configuration files required by all programs. This directory only contains static configuration files which do not change without administrator intervention.

- **Example:** `/etc/passwd` - Contains user account information.

5. /var - Variable Files

`/var` contains files to which the system writes data during the course of its operation. This includes things like logs, spool files, and cached data.

- **Example:** `/var/log` - Directory containing log files.

6. /tmp - Temporary Files

Used to store temporary files created by system and users. Files under this directory are usually deleted whenever the system is rebooted.

- **Example:** Files created by applications for temporary storage of data.

7. /usr - User Programs

Contains the majority of user utilities and applications, with binaries, libraries, documentation, etc.

- **Subdirectories:**
 - `/usr/bin` - Non-essential binaries for general users.
 - `/usr/sbin` - Non-essential system binaries, usually for system administration.
 - `/usr/local` - Local hierarchy where locally compiled applications install to.

8. /home - Home Directories

Home directories for all the user accounts. Each user has a directory within `/home` for personal storage.

- **Example:** `/home/username` - User's personal directory.

9. /boot - Boot Loader Files

Contains files needed to boot the system, such as the Linux kernel itself, and the boot loader.

- **Example:** `/boot/grub/grub.cfg` - GRUB boot loader configuration file.

10. /lib - System Libraries

Contains library files that support the binaries located in `/bin` and `/sbin`.

- **Example:** `/lib/libncurses.so` - Library for controlling writing to the console.

11. /opt - Optional add-on Applications

`/opt` is reserved for all the software and add-on packages that are not part of the default installation.

- **Example:** `/opt/chrome` - Google Chrome browser.

12. /dev - Device Files

Contains device files. These include terminal devices, usb, or any device attached to the system.

- **Example:** `/dev/sda` - First hard disk drive.

13. /proc - Process Information

A virtual filesystem providing process and kernel information as files. In Linux, processes are treated as files.

- **Example:** `/proc/cpuinfo` - Shows CPU information.

14. /sys - System Files

Another virtual filesystem that contains information about the system, and configurations (similar to `/proc` but for system hardware).

- **Example:** `/sys/class/net` - Network device information.

15. /media and /mnt - Mount Directories

- /media - Temporary mount directory for removable devices.
- /mnt - Temporary mount directory for mounting file systems.
- **Example:** /media/cdrom or /mnt/mydisk.

Understanding this structure helps users and administrators find and store files in appropriate locations, ensuring a well-organized and maintainable system.