

u train

Linux top level directory structure





u train

Table of content

- 1. What is a directory?
- 2. Directory structure in Linux
- 3. The ROOT directory
- 4. The ROOT subdirectories







What is a directory?

How are they organized in our OS?





What is a directory?

- ♦ A directory in computing is a way of organising files and folders.
- It also refers to a container that holds other directories and files.
- A directory is also known as a 'folder' and a directory inside another directory is called a 'subdirectory' or a 'subfolder'.
- Directories in a hierarchical structure are logically organised, which makes it easier to find them on the Hard drive.







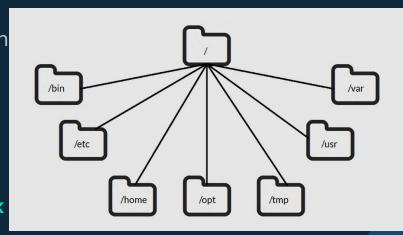
How are directories organized in a Linux system?





Directory structure in Linux

- The Linux directory structure can be visually represented as an upside-down tree with a
 - root(base directory),
 - branches(subdirectories)
 - and leaves (files)
- ♦ The directory separator in Linux is the forward slash (/).





Directory structure in Linux

- While all file systems have a root directory, it may be labeled differently depending on the operating system.
 - In Windows for example, the default root directory is C:\.
 - On Unix systems, the root directory is typically labeled simply / (a single forward slash).
- As you move up directories within a file system, you will automatically reach the root directory.

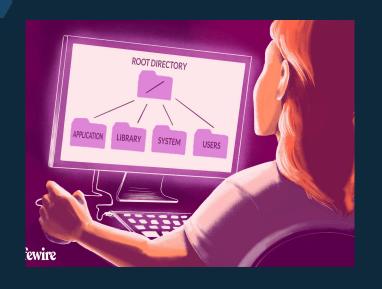




The ROOT (/) directory

Starting point in a Linux directory structure?





The ROOT of the system

Is the starting point of the file system hierarchy





The ROOT directory in Linux

- Everything on your Linux system is located under the / directory, known as the root directory.
- It is the starting point for the file system hierarchy. Note that this is not related to the root user (superuser) account.
- It is the top level directory in your system and all the rest of the directory structure emanates from it like branches from the root of a tree.
- Simply put, it contains all other folders and files of the system Let's look at some important subdirectories of the root







The ROOT (/) subdirectories

Let's check some important direct subdirectories of the / in Llnux



Root subdirectories: /bin

/bin - Essential User Binaries

- The /bin directory contains the essential user binaries (programs) that are used in a single user system. For multi-users system, these binaries are usually stored in the /usr/bin directory
- Important system programs and utilities such as the bash shell are located in /bin.
- Commands like chmod or ls are usually directed to one of these two directories where the program exists.







/boot - Static Boot Files

- ♦ The **/boot** directory contains the files needed **to boot up the system**.
- Loader's files and your Linux kernel files are stored here.

/dev - Device Files

It contains a number of special files that represent devices. These files are required for interfacing with the Hardware







<u>/etc - Configuration Files</u>

- The **/etc** directory contains **configuration files**, which can generally be edited in a text editor. This files are local to the machine.
- Note that the /etc directory contains system-wide configuration files. That is user-specific configuration files are located in each user's home directory!





Root subdirectories: /home

/home - Home Folders

- The /home directory contains a home folder for each user account.
- That is, each user created by the administrator will have a directory in the /home with the name of the user account.

Example: If your user name is **bob**, you have a home folder located at **/home/bob**.

This /home folder contains the user's data files and user-specific configuration files. Each user only has write access to their own home folder and need to switch to the root user to make some operations.





/lib - Essential Shared Libraries

- The **/lib** directory contains libraries needed by the essential binaries in the **/bin** and **/sbin** folder.
- Shared libraries needed at bootup, or which need to be run by top level commands are stored here.
- Libraries which support users are usually located in /usr/lib.





Root subdirectories: /mnt

/mnt - Temporary Mount Points

- It is an optional but very popular directory that contains mount points for external storage devices.
- To access a floppy disk drive you **cd** to **mnt/floppy.**
- Once an external drive is accessed, its file system is mounted to the host system in /mnt directory







/opt - Optional Packages

- The **/opt** directory contains subdirectories for **optional software** packages.
- It's commonly used by proprietary software that doesn't obey the standard file system hierarchy
- Example: a proprietary program might dump its files in /opt/application when you install it.





Root subdirectories: /proc

/proc – Kernel & Process Files

- The /proc contains a virtual file system created and used by the currently running Kernel.
- Here you can also obtain informations on current running processes.





Root subdirectories: /lost+found

/lost+found - Recovered Files

- Each Linux file system has a **/lost+found** directory.
- If the file system crashes, a file system check will be performed at next boot.
- Any corrupted files found will be placed in the /lost+found directory, so you can attempt to recover as much data as possible.
- Also, When the file system cannot properly identify files, the respective files are placed in this directory





Root subdirectories: /root

/root - Root Home Directory

- The **/root** directory is the home directory of the root user. That is, it contains configuration files for the root user.
- Instead of being located at /home/root, it's located at /root. This is distinct from /, which is the system root directory.





Root subdirectories: /sbin and /tmp

/sbin - System Administration Binaries

- The **/sbin** directory is similar to the **/bin** directory.
- It contains essential binaries that are generally intended to be run by the root user for system administration.

/tmp - Temporary Files

- Applications store temporary files in the /tmp directory.
- These files are generally deleted whenever your system is restarted and may be deleted at any time by some utilities.







/usr - User Binaries & Read-Only Data

- lt is design to store **static, sharable read only data**
- The /usr directory contains programs and files used by all users
- Data which results from these programs is usually stored elsewhere (often in folders like /var)







<u>/var - Variable Data Files</u>

- The /var contains administrative files such as system logs, and data that changes frequently
- Most, but not all files in this directory are shared
- ♦ It is also another popular location for web server document roots
- you'll find log files in /var/log







There are many other directories in the Linux system such as: /selinux, /run ...
You can look for them to know what they contain and their function in the overall system directory structure.

Linux Top Level **Directory Structure**

/ (ROOT)

Mandatory directory - the beginning of the filesystem; includes all of the directories beneath it



Mandatory directory contains the binaries that are used in single-user systems For multi-user systems these binaries are usually stored in the /usr/bin directory; a command such as Is or chmod is usually directed to one of these two directories where the program exists

/boot Mandatory directory-Stored in this directory are files that are required for the Linux boot process. Such files

include vmlinuz.

the Linux kernel

/dev Mandatory directory-Contains device files required for interfacing with hardware : stores device files. sockets, and named pipes



/proc

file

Optional but widely used directorycontains a virtual filesystem which is created and used by the currently running kernel. It is deleted when the system is shut down. Frequently, monitoring programs use the /proc directory to obtain information on currently running processes and other environmental information.



Optional directory intended to contain software packages which are added to the original system

/root

Optional but widely used directory-created to eliminate clutter from the "/" directory. It contains configuration

files for the root user.

/etc

Mandatory directory-Contains configuration files which are local to the machine: divided into many subdirectories

/lost+found

When the filesystem cannot properly identify files, the respective files are placed in this directory. If data appears to have been lost mysteriously, it is a good idea to check in this directory (or ask your system administrator to check for you).

/sbin

Mandatory directory - originally a place to store static binaries. It has been expanded to include administrative binaries which are used by the root user only

/home

Optional but widely used directory- Contains user account directories. Each user created by the system administrator will have a subdirectory under /home with the name of the account The /home irectory may also be found as a subdirectory in the /var directory Frequently web server document roots are located in the /home directory: Usually occupies one of the larger partitions on a hard disk

/tmp

Mandatory directory used by programs to store temporary files. Files which are located here are often flushed on reboot or flushed periodically.

/usr

This is a

top level

mandatory

directory. Shared

bootup or which

commands are

Libraries which

support users are

usually stored in

stored here.

the /usr/lib

directory.

need to be run by

libraries needed at

Mandatory directory designed to store static, sharable, readonly data. Programs which are used by all users are frequently stored here. Data which results from these programs is usually stored elsewhere (often /varl.

/mnt

Optional but very popular directorydirectory contains mount points for external storage devices. To access a floppy disk drive you cd to mnt/floppy. Once an external drive is accessed, its file system is mounted to the host system in the /mnt directory.

Mandatory directory contains administrative files (such as system logs) and data that changes frequently (such as spool directories and caches like incoming mail and news) - stores variable data like logs, mail, and process specific files. Most, but not all. subdirectories and files in the /var directory are shared. This is another popular location for web server document roots.





Thanks!

Any questions?

You can find us at:

website: http://utrains.org/

Phone: +1 (302) 689 3440

Email: contact@utrains.org







Click on the link below to contact the support team for any issue!

utrains.org/support/

Create a ticket for your problem and we will get back to you soon!