

Understanding the UNIX and Linux Filesystems

Some UNIX/Linux Symbols:

Symbol	Common Name(s)	UNIX Name(s)	Usage
~	tilde	"tilde", "squiggly"	to represent the absolute (full) path of your home directory
#	pound sign, number sign, octothorp	"pound"	to begin comments in scripts; as the prompt character for a root user
!	exclamation point	"bang"	to run commands from history
/	forward slash, right slash	"slash"	to represent the root (topmost) directory; to separate directories and filenames in paths
\	back slash, left slash	"backslash"	as an "escape", to protect a character immediately to its right; to continue commands on multiple lines
.	period, dot	"dot"	to start filenames for hidden files; to separate base filenames from file extensions
\$	dollar sign	"dollar"	to get the value of a variable; as the prompt character for a non-root user
*	asterisk	"star"	as a "wildcard" to match any filenames

Home directories:

Each user has his or her own personal home directory. You are automatically placed into your home directory whenever you log in or open a new terminal window.

Your own personal home directory is abbreviated by a **tilde** character: ~

You can use a tilde to refer to your home directory in most cases, for example, to copy and/or move files to and from your home directory.

Top-level directories:

The topmost directory of the filesystem is called the *root directory* -- not to be confused with the *root* user (the system administrator or *superuser*). It is represented by a **slash** character: `/` and will be referred to as "*slash*".

On a Linux system, the root user's home directory is `/root` -- that is, a subdirectory of the root directory, `/`, called *root*. This directory will be referred to as "*slash root*".

Setting your prompt:

Under Linux, users typically use **bash** (the "Bourne-Again SHell"). A recommended prompt setting to help you navigate through the filesystem is:

```
PS1='\h:\w\$ '
```

- ◆ The `\h` will display the name of the computer that you are currently logged into.
- ◆ The `\w` will display the full path of the current working directory (c.w.d.), and displays a tilde when you are anywhere in your home directory.

To make this prompt setting permanent, put it into your `.bashrc` file (in your home directory).

Pathnames:

In UNIX, a *pathname* can be viewed as a map to access any file or directory. A pathname consists of at least the filename, but can be preceded by one or more directory names, separated by slashes.

Every pathname can be categorized as one of three types:

absolute pathname (absolute path or full path or full pathname):

- ◆ starts from `/` (the root directory) and descends downwards into the filesystem
- ◆ always begins with a `/`

absolute pathname (continued...)

- ◆ always gets to the file or directory -- no matter what your **current working directory** (c.w.d.) is

examples: /usr/local/bin
 /usr/local/adobe/bin/acroread
 /tmp

special absolute pathnames

/ the root directory -- the topmost directory in the filesystem

~ your personal home directory -- this is different for each user on the system

relative pathname

- ◆ depends on your c.w.d.
- ◆ you can either go up or go down the filesystem hierarchy (viewed as an upside-down tree)
- ◆ .. goes up, the name of a directory or file goes down
- ◆ does *not* begin with a /

examples: docs/somefile
 ./myscript
 ../../bin/someprogram

simple filename

- ◆ does not contain any parent directory names and/or slashes
- ◆ simply the name of a file or directory
- ◆ a simple filename is a special case of a relative pathname -- it specifies a file or directory in the c.w.d.

other special relative pathnames

- .. go up (ascend) one directory level -- this is called the "parent" directory
- . stay where you are (i.e., use the c.w.d.) -- this is called the "current" directory

Current Working Directory (c.w.d.):

- ◆ Every command, when running, has a current working directory.
- ◆ When processing simple filenames or relative pathnames, the current working directory is important.
- ◆ With the shell (Bash), to find out your c.w.d., use the **pwd** command, or set the prompt variable (**PS1**) to display the c.w.d. at all times (**\w** switch).
- ◆ When you run the **cd** command, in most cases, your c.w.d. will change.