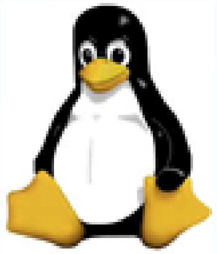
Introduction to UNIX/LINUX for Software Testers

What is UNIX?



- **UNIX** is a computer Operating System which is capable of handling activities from multiple users at the same time. It is used by most high-performance computing systems.
- Unix was originated around in 1969 at AT&T Bell Labs by Ken Thompson and Dennis Ritchie.
- There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are few examples. Linux is also a flavor of Unix which is freely available.

Main Features of UNIX

- **multi-user**
  more than one user can use the machine at a time
  supported via terminals (serial or network connection)

- **multi-tasking**
  more than one program can be run at a time

- **hierarchical directory structure**
  to support the organisation and maintenance of files

- **portability**
  tools for program development
  a wide range of support tools (debuggers, compilers)

Where a tester can use Unix/Linux?

- Testing processes that are running on the server site
- Setting data/modifying files for different types of testing
- Performing back end testing activities like fetching and verifying logs
- Grey Box testing

Common Activities performed by Tester on Unix/Linux Environment

In most of the companies, Application Server are placed on Unix/Linux machine so many times we need to access these server machine to perform different activities

- Install / Uninstall Software Application
- View Log Files
- Verify CPU/Memory Status
- Start / Stop Processes, Kill Processes

UNIX Architecture

The main concept that unites all versions of UNIX is the following four parts: the kernel, the shell, commands and utilities, files and directories.

- **The kernel** is the heart of the operating system. It is a set of computer programs that allocate the system resources and coordinate all the details of the computer's internals. The kernel

  schedules tasks
  manages data/file access and storage
  enforces security mechanisms
  performs all hardware access

Unix Architecture (continue)

- **The shell** is a command line interpreter; it translates commands entered by the user and converts them into a language that is understood by the kernel. C Shell, Bourne Shell and Korn Shell are most famous shells which are available with most of the Unix variants The shell

  presents each user with a prompt
  interprets commands types by a user
  executes user commands
  supports a custom environment for each user

Unix Architecture (continue)

- **Commands and Utilities:**

file management (rm, cat, ls, rmdir, mkdir)
user management (passwd, chmod, chgrp)
process management (kill, ps)
printing (lp, troff, pr)

There are various command and utilities which you would use in your day to day activities. cp, mv, cat and grep etc. are few examples of commands and utilities. There are over 250 standard commands plus numerous others provided through 3rd party software. All the commands come along with various optional options.

Unix Architecture (continue)

- **Files and Processes:**

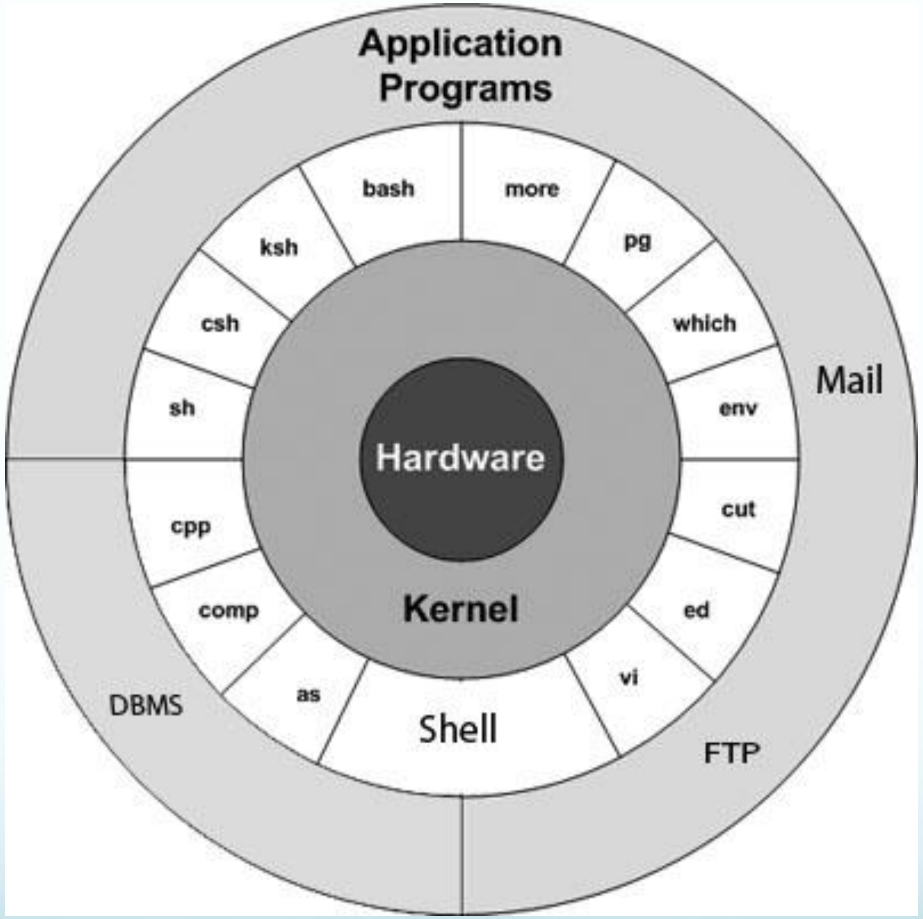
All data in UNIX is organized into files.

A file is a collection of information, which can be data, an application, documents; in fact, under UNIX, a file can contain anything.

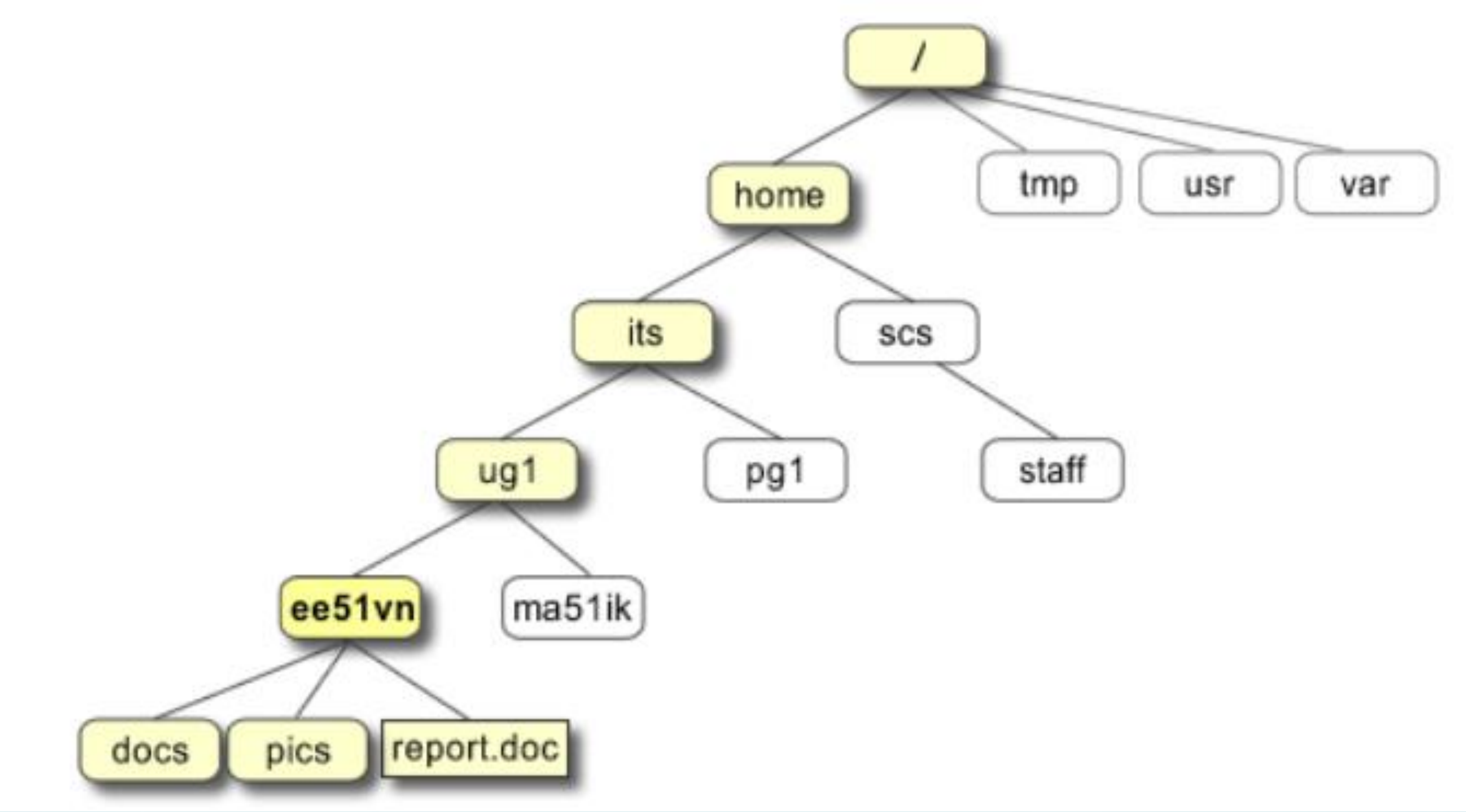
Files are created by users using text editors, running compilers etc. All files are organized into directories. These directories are organized into a tree-like structure called the file system.

A process is an executing program identified by a unique PID (process identifier).

Unix Architecture



Directories Tree



Command Syntax

A UNIX command line consists of the name of the UNIX command followed by its arguments (options, filenames and/or other expressions) and ends with a RETURN.

The general structure for a UNIX command is:

```
command    -option[s]    argument(s)
```

Options modify the way that a command works. For example the wc command counts the number of words, characters and lines in a file. By using a different option you can choose what is counted.

- wc -w file1   counts the words
- wc -c file1   counts the characters
- wc -l file1   counts the lines

Command Syntax (continue)

There are several rules with UNIX commands that you should follow:

1. UNIX commands are case-sensitive, but most are lowercase.
2. UNIX commands can only be entered at the shell prompt.
3. UNIX command lines must end with a RETURN (Enter).
4. UNIX options often begin with a “-” (minus sign).
5. More than one option can be included with many commands.

ls command

The **ls** command is one of the most important command line tools you should learn in order to navigate the file system. It is used to list files and directories.

ls syntax:

ls [OPTION]... [FILE|DIR]

Option	Description
ls -a	list all files including hidden file starting with '.'
ls -l	list with long format - show permissions
ls -t	sorted list by time & date
ls -r	list the content in reverse order
ls -s	list file size
ls –al	list with long format and show hidden files
ls *	list all subdirectories

pwd (print working directory)

Command **pwd** returns and prints the absolute path of the current working directory. For example, to find out the absolute pathname of your home-directory, type **pwd**

Exercise

Use the commands ls and pwd to explore the file system.