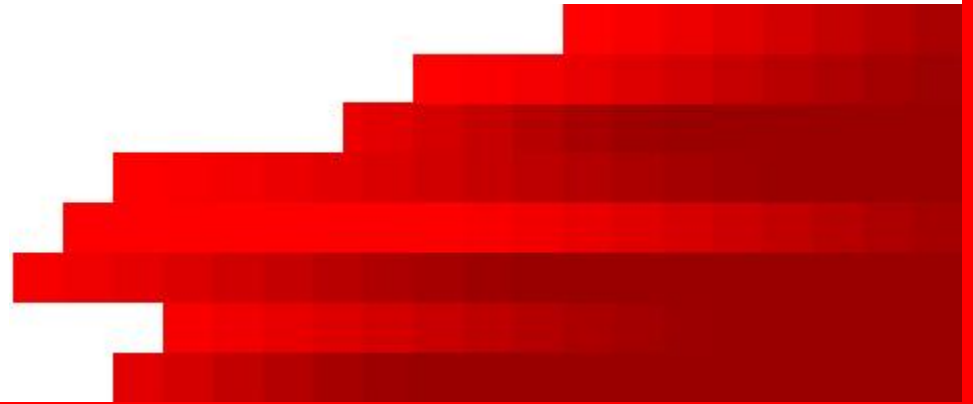


UNIX and Shell scripting

Module 1 – Introduction to Unix



HSBC Technology and Services



Operating System

▶ What is Operating System ?

- An operating system is a set of programs that controls a computer.
- The operating system act as an interface between the user and the hardware.

Example: DOS, Windows XP, UNIX, Novel Netware

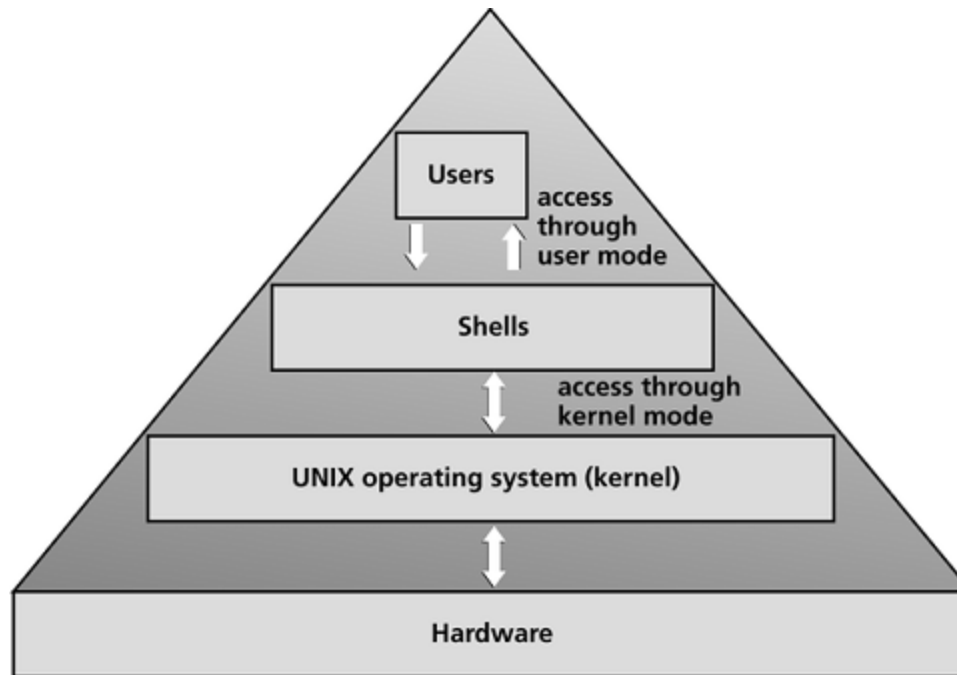
▶ There are different types of Operating Systems

- Single User
- Multi User
- What kind of Operating System is Unix ?

History of Unix

- ▶ UNIX was originally developed at Bell Labs in 1969
- ▶ First operating system written in High Level Language (C) by Ken Thompson & Dennis Ritchie in 1973
- ▶ Licensed to Universities in the year 1974
- ▶ It is a multi-user and multi-tasking Operating System
- ▶ Unix Flavors:
 - Sun Solaris, HP-UX, AIX, IRIX, Digital Unix

Unix Operating System Architecture





Shell

- ▶ Called as command interpreter
- ▶ Acts as an interface between the user and the kernel
- ▶ Has programming capabilities
- ▶ Types of shells
 - Bourne shell
 - C shell (Tcsh)
 - Korn shell
 - TC Shell

Types of shells

▶ Bourne shell

- Developed by Steve Bourne at AT&T
- Supports basic commands

▶ Korn shell

- Developed by David Korn at AT&T
- Supports command line editing and command history

▶ C-shell

- Developed by Bill Joy for Berkeley Unix
- Supports c-like scripting language

Basic Unix commands

- ▶ `cal` : The `cal` command displays a calendar of the specified year or month
- ▶ `date` : Displays or sets the date or time.
- ▶ `Who` : Identifies the users currently logged in
- ▶ `who am i` : Displays current user
- ▶ `finger` : Output user information



Working with files

- ▶ Unix file System
- ▶ Types of files
- ▶ File naming conventions
- ▶ Standard directories of UNIX system
- ▶ Path names
- ▶ Various directory commands
- ▶ Metacharacters or wildcard characters



Types of files

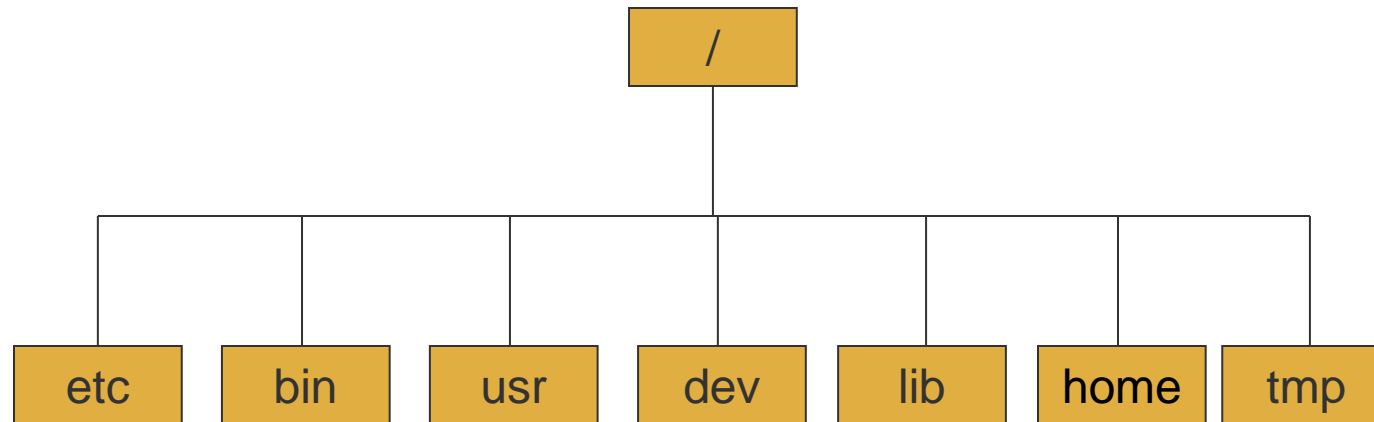
- ▶ Ordinary files
- ▶ Directory files
- ▶ Special files (device files)
 - Character device files
 - Block device files



File naming conventions

- ▶ Supports maximum of 255 characters
- ▶ No concept of primary and secondary name
- ▶ Alphabets, digits, dot and underscore
- ▶ Does not allow space or tab
- ▶ Commands and reserved words can not be used for file names
- ▶ Case sensitive

Standard directories



/ – root

/etc – the system administration utility files

/bin – most commonly used UNIX commands

/usr – User's home directories

/usr/bin – Contains all command

/dev –all device files

/lib – library files for C programming

/tmp – temporary storage

/home/userid – Created by system when user account is created.

/etc/group – Contains a list of all known groups

/etc/passwd – Contains a list of all known users



User

▶ Root User:

- System administrator account
- / Or /root refers to the root directory
- su command to get the root users power

▶ User account:

- Normal account
- `cat /etc/passwd | grep userid`



Path

- ▶ The exact location of a file / directory
- ▶ The path can be absolute or the relative
 - absolute path name - Referring to a file from the root directory
 - relative pathname - Referring to a file from the current directory
- ▶ . refers to the current directory
- ▶ .. refers to the parent directory
- ▶ We can find out the current working folder by using the pwd command

Directory & File Commands

▶ Directory Commands

- pwd
- mkdir
- rmdir
- cd
- ls

▶ File Commands

- touch
- cat
- rm
- mv

Present Working Directory

- ▶ To know the current working folder use the pwd command.

- ▶ Example:

```
$ pwd  
/usr/John
```

Changing directories

- ▶ When you log in, your current directory is set to your home directory.
- ▶ To change current working directory to 'project' which is in your present working directory, issue the following command:
 - `$ cd project`
- ▶ You can always find out the absolute pathname of the current working directory by using the `pwd` command:
 - `$ pwd`
- ▶ If you are using `sh` as your shell, you can always return to your home directory by typing:
 - `$ cd`
- ▶ Changing directory to parent
 - `$ cd ..`



Change directory

- ▶ `cd <directory_name>` - Changes the current directory

File Listing_____

▶ ls - Lists the current directory

- l
- a
- i
- d
- R
- r
- t

▶ For the complete list of the options and their descriptions, please refer to the manual pages



Wild cards

- ▶ *
- ▶ ?
- ▶ [list]

Demonstration

Activity

- Display the filenames starting with “a” and ending in a digit.
- Display the filenames whose file extension is “cc”



Create a file

- ▶ You can create a file by issuing the following command:
- ▶ `$ cat > <file name>`
- ▶ `abc.....`
- ▶ `xyz.....`
- ▶ `Ctrl + Z`

List the file contents

- ▶ cat command can be used to display the contents of a file
- ▶ Example:

```
$ cat file1.txt
```

```
This is a sample file
```

```
$
```



Delete files

▶ To delete a file

```
$ rm <file_name>
```

▶ You can delete multiple files by issuing the following command.

```
$ rm file1 file2 file3
```

Options

- r → recursive
- i → interactive mode
- f → forceful

Create a directory

- ▶ You can create a directory by using the `mkdir` command. For example, to create a directory named `dir1` within the current working directory:

Example:

- `$ mkdir dir1`
- `$ mkdir /usr/user1/dir1`
- Options
- `-p` -> Creates all directories along the path name specified



Remove a directory

- ▶ Removes a directory
- ▶ To remove a directory
 - Must be empty
 - Should not be the current directory or at a higher level
 - Should not be the home directory
 - -p -> Removes all directories along the path name specified
 - `$ rmdir -p /home/demo/mydir`



File level security

- ▶ User : File Owner
- ▶ Group : Users who are members of file group
- ▶ Other :Users who are not user or from group.
- ▶ All : All of above



Files and directories

Access mode	Ordinary file	Directory file
Read	Allows examination of the file content	Allows listing of the files within the directory
Write	Changing contents of the file	Creating new files and removing old ones
Execute	Executing file as a command	Allows searching a directory



Types of access to files/directory

- ▶ Write – modifying and adding to files/directories
- ▶ Read – examining the file/directories contents
- ▶ Execute – execution of files as programs/ Recurse the directory structure

Determining file access permission

ls -l

total 240

A

-rwxr-xr-- 3 ajay acc 2080 oct 10 09:34 mydoc.doc

rwx	rwx	rwx
owner	group	other

File access permissions

- ▶ A- total number of disk blocks occupied by the files
- ▶ B- type of the file
 - - ordinary file
 - d – directory
 - c- character device
 - b – block device
- ▶ C- its access permissions
- ▶ D- number of links to the file
- ▶ E- the owner of the file
- ▶ F- the group of the owner of the file
- ▶ G- the size of the file in bytes
- ▶ H- the date and time of last modification
- ▶ I – the file name

Copying files

▶ `cp` : copy a file
`$cp <file1> <file2>`

Examples:

`$ cp <file1> <dir>` - copies a file1 to directory “dir”

Moving and renaming files

- ▶ “mv” command is used to rename or move the files

Examples:

```
$ mv <file1> <dir>      - moves a file to another directory
$ mv file1 file2        - renames a file from “file1” to “file2”
$ mv file1 file2 dir    - moves “file1”, “file2” to the directory “dir”
$ mv -i file1 file2     - renames a file from “file1” to “file2” in interactive response, useful if file
                        already exists
```

The Unix manual

- ▶ Unix manuals help in providing the complete information about the commands.
- ▶ Syntax:
`$man <command>`
- ▶ Issue the following command to view the manual page of “pwd” command
`$man pwd`
- ▶ Press “q” to come out of the manual page



About HSBC Technology and Services

HSBC Technology and Services (HTS) is a pivotal part of the Group and seamlessly integrates technology platforms and operations with an aim to re-define customer experience and drive down unit cost of production. Its solutions connect people, devices and networks across the globe and combine domain expertise, process skills and technology to deliver unparalleled business value, thereby enabling HSBC to stay ahead of competition by addressing market changes quickly and developing profitable customer relationships.

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