Capgemini

UNIX

Lesson 01 : Introduction to UNIX Operating System

Lesson Objectives

- In this lesson, you will learn:
  - Operating System
    - Functions of Operating System
    - History of UNIX
    - Features of UNIX
    - UNIX System Architecture
  - Basic UNIX Commands

1.1: Operating System Overview

An Operating System (OS) is the software that manages the sharing of the resources of a computer and provides programmers with an interface that is used to access those resources.

Functions of an Operating System

Following are some of the important functions of an OS:

- Process Management
- Main-Memory Management
- Secondary-Storage Management
- I/O System Management
- File Management
- Protection System
- Networking
- Command-Interpreter System

1.2: History of Unix
History

Unix (officially trademarked as **UNIX**, sometimes also written as UNIX) is a multitasking, multi-user computer operating system originally developed in 1969 by a group of AT&T employees at Bell Labs, including Ken Thompson, Dennis Ritchie, Brian Kernighan, Douglas McIlroy, and Joe Ossanna. The Unix operating system was first developed in assembly language, but by 1973 had been almost entirely recoded in C, greatly facilitating its further development and porting to other hardware Developed by programmers for programmers

Became widely available in 1975.

University of California, Berkeley created the Berkeley Software Distribution (BSD) version.

AT&T combined their version with BSD, XENIX, and SunOS to create System V

Multi-user, Multi-tasking Operating System

Unix Flavors:
- Sun Solaris (SUN), HP-UX (HP), AIX (IBM), IRIX(SGI), Digital Unix(DEC)

Unix: What’s in a name?

Unix may be shown as UNIX ®, Unix, Unix®

UNIX® is a register trademark of The Open Group (as of 2007) the certifying body of the UNIX trademark

1.3: Features of Unix
Features

UNIX OS exhibits the following features:

- It is a simple User Interface.
- It is Multi-User and Multiprocessing System.
- It is a Time Sharing Operating System.
- It is written in “C” (HLL).
- It has a consistent file format - the Byte Stream.
- It is a hierarchical file system.
- It supports Languages such as FORTRAN, BASIC, PASCAL, Ada, COBOL, LISP, PROLOG, C, C++, and so on.

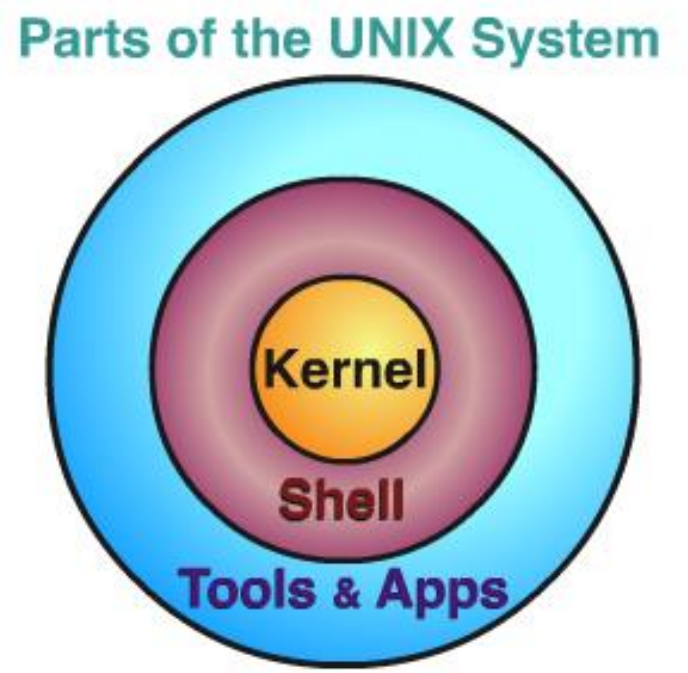
Services

Services Provided by UNIX:

- Process Management:
  - It involves Creation, Termination, Suspension, and Communication between processes.
- File Management:
  - It involves aspects related to files like creation and deletion, file security, and so on.

1.4: UNIX System Architecture
UNIX System Architecture

- Following is a pictorial representation of the UNIX system:



Components

Kernel

- Core of the UNIX system. Loaded at system start up (boot). Memory-resident control program.
- Manages the entire resources of the system, presenting them to you and every other user as a coherent system. Provides service to user applications such as device management, process scheduling, etc.
- Example functions performed by the kernel are:
  - managing the machine's memory and allocating it to each process.
  - scheduling the work done by the CPU so that the work of each user is carried out as efficiently as is possible.
  - accomplishing the transfer of data from one part of the machine to another.
  - interpreting and executing instructions from the shell.
  - enforcing file access permissions.

Components

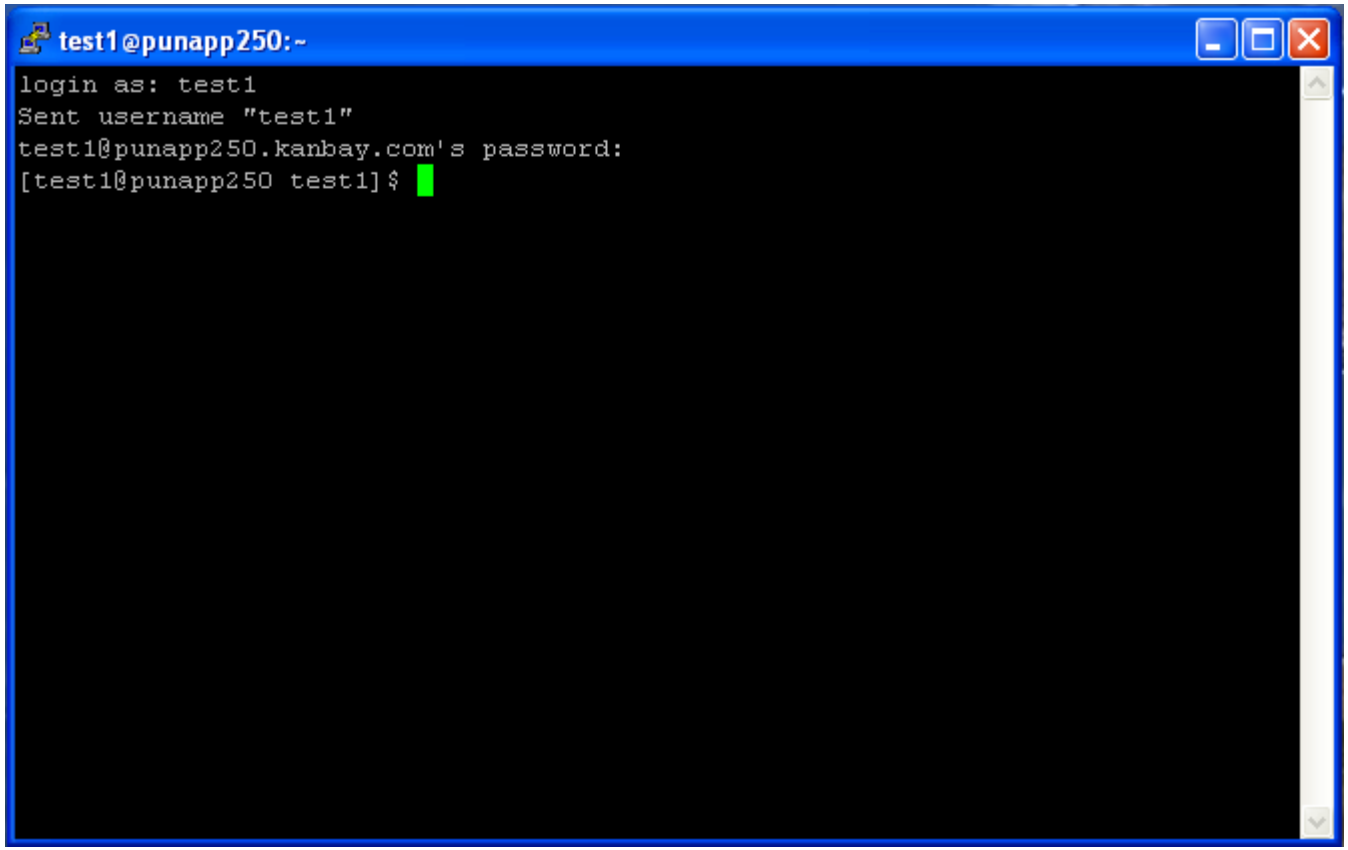
Shell

- Whenever you login to a Unix system you are placed in a shell program. The shell's prompt is usually visible at the cursor's position on your screen. To get your work done, you enter commands at this prompt.
- The shell is a command interpreter; it takes each command and passes it to the operating system kernel to be acted upon.
- Several shells are usually available on any UNIX system, each with its own strengths and weaknesses.
- Different users may use different shells. Initially, your system administrator will supply a default shell, which can be overridden or changed. The most commonly available shells are:
  - Bourne shell (sh)
  - C shell (csh)
  - Korn shell (ksh)
  - Bourne Again Shell (bash)
- Each shell also includes its own programming language. Command files, called "shell scripts" are used to accomplish a series of tasks.

1.4: Log in to Unix
Log in

- you will need to have a valid username and a password
- Type your username at the **login** prompt
  - UNIX is case sensitive
  - When the **password** prompt appears, type in your password.
  - Your password is never displayed on the screen as a security measure.

Login screen



How to change the passwords

passwd command

Old password: - *enter your current password*

New password: - *enter your new password*

Retype new password: - *re-enter your new password*

Logging Off The System

- To logout enter the command logout or exit.
- If this does not, work press Ctrl-d.

SUMMARY

- In this lesson, you have learnt:
  - UNIX is multi-user, multiprocessor, time sharing operating system.
  - It uses hierarchical file system.
  - The UNIX system is functionally organized at three levels: Kernel, shell, tools and applications.

Review Questions

- Question 1: ___ controls system hardware.
- Question 2: The kernel interacts with the machine hardware, and the shell interacts with the User.
  - True / False
- Question 3: ___ command displays details of all users currently logged in.