MIT World Peace University

Computer Networks
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Module 1 - Class Notes

Notes

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Contents

1 Operating System

What is an operating system?

1. It is a program that acts as an intermediary between a user and the hardware.
2. It is also the program taht controls the execution of application programs.
3. It allocates resources effectively.

The main Objective is convenience, efficiency and providing an environment. It has a kernel, and is always running all the time.

2 System Calls

System calls are what are called by the operating system to the kernel. When you say things like printf and all they then invoke system calls Examples are read(), write() etc

3 Shell

The shell is simply another program on top of the kernel which provides a basic human os interface.
There are different types of shells

1. /bin/csh - It is the C Shell
2. /bin/tcsh - Enhanced C Shell
3. /bin/sh - The Bourne Shell / POSIX shell
4. /bin/ksh - Korn Shell
5. /bin/bash - Korn Shell Clone from GNU

All linux systems use the bash shell as the default.

3.1 Scripts

A script is a bunch of lines of the script written in a plain text file.

3.2 Why should we write shell script?

1. Shell script can take input from the user or file and then output them on the screen.
2. Useful to create our own commands. Save lots of time
3. To automate some tast of daily life.
4. System administration part can be automated.

3.3 Practical Examples where you can use scripts

1. Monitor your systemdata backupFind out what process are taking up resources
2. Find out which memory is free
3. Find which users are logged in
4. Find out if all necdessary network services are running etc.

4 OS Components and Functions

1. Process Management and CPU scheduling: *A Process is when a part of your program is in its execution state.*
   A program is on a higher level than the process. One Program can have a lot of processes. On an even higher level is the job or the task. The tast is the highest level. Whenever you say something exclusively in your program, then doing that is caleld a process.

   A process needs certain resources, including CPU time, memory, files, and IO devices.

   The Operating system is responsible for the following activities

   (a) Process creation and deletion
   (b) Process suspension and resumption
   (c) Provision of mechanisms for process synchronization and Process communication

2. Memory Management

   (a) Memory is a large array of words or bytes. Each with its own address
   (b) It is a repository of quickly accessible data shared by the CPU and IO devices
   (c) Main memory is a volatile storage device. It loses its contents in case of a system failure.
   (d) The Operating system is responsible for the following activities in connections with memory management
      i. Keeping track of which parts of the memory are currently being used and by whom.
      ii. Deciding which process to load when memory space becomes available
      iii. Allocating and deallocating memory space as needed.

3. File Management

   There are 2 types of Files. Sequential and Direct Access Files.

   (a) A File is a collection of related information defined by its created. Commonly files represent programs and data
   (b) The operating system is responsible for the following activities in connections with file mangement.
      i. File creating and deletion
      ii. Directory creation and deletion
      iii. Support of primitives for manipulating files and directories.

iv. Mapping files onto secondary storage. File backup on stable or non volatile storage media.

4. IO System management.

   (a) Control of devices connected to computer

   (b) IO Devices vary widely in their function and speed, so different methods are needed to control them.

   (c) Device drivers are required to provide an interface to IO devices

   (d) Also the IO system consists uses buffering to take care of speed difference between IO devices and processor.

5 Security