UNIX SYSTEM PROGRAMMING

Introduction

Chandravva Hebbi
Department of Computer Science and Engineering
chandravvahebbi@pes.edu

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Topics to be Covered

- Introduction
- Course outline

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Introduction

What is System Programming?

Why Unix or Linux?

Why C?

Operating System

An operating system (OS) a system that manages the resources of a computer.

Resources: CPUs, Memory, I/O devices, Network

Provides an interface between an application program and the computer hardware.

Types of operating systems : real time, multiuser, multitasking, embedded, distributed etc.

Unix is a family of multitasking, multiuser computer operating systems that derive from the original AT&T **Unix**, developed in the 1970s at the Bell Labs research centre by Ken Thompson, Dennis Ritchie, and others.

One of the first operating systems to be written in high level programming language.

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Flavours of UNIX

- AIX
- Solaris
- HP-UX
- MINIX
- XENIX
- SCO UNIX
- LINUX
- ……

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History of UNIX

- First developed in AT&T Bell Labs around 1969
  - Original designer was Ken Thompson
  - Backlash against Multics
  - Originally called Unics
  - Built on PDP-7
  - Basic design principles
    - Time-sharing
    - Programmer friendly
- Distributed freely
- Enhanced by team

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History of UNIX

- Development of C
  - Dennis Ritchie
  - Used to port UNIX onto PDP-11
- Continued enhancement till 1993
  - Last version System V Release 4
  - Sold to Novell

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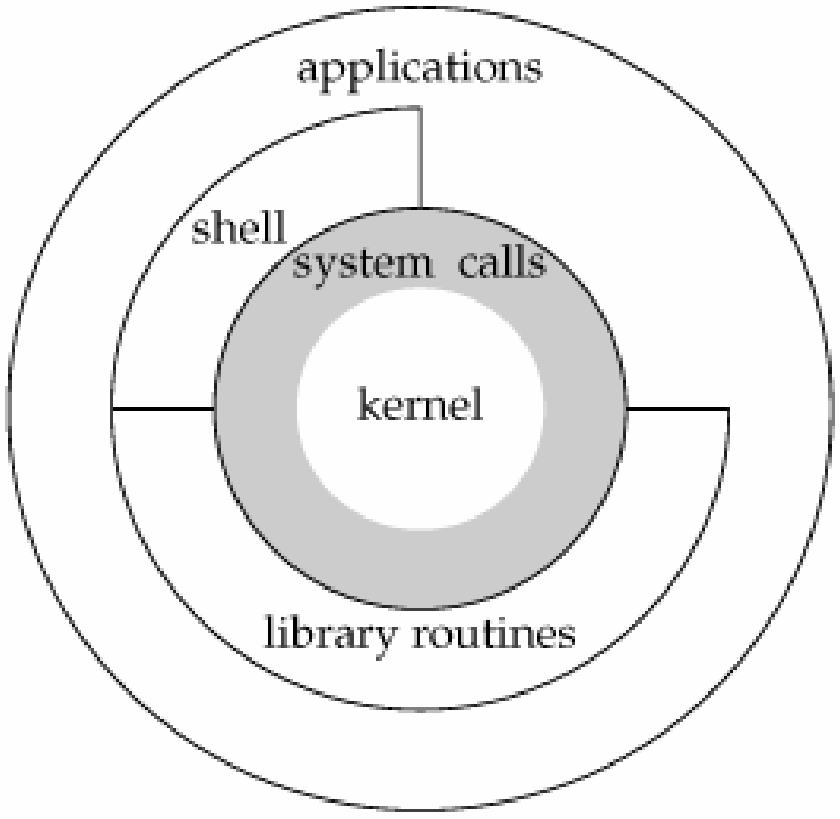
UNIX Architecture



System Kernel

- Kernel: the memory resident portion of Unix system
- File system and process control system are two major components of Unix Kernel.
- Three major tasks of kernel:
  - Process Management
  - Device Management
  - File Management

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Shell

- Command Line Interface
- Flexible
- Programmable

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System Call

- Application programs request services provided by kernel using system calls (API)
- Switch to kernel mode
- Provides minimal interface
- Requires proper error handling code at application side
- Examples:-
  - File I/O : - open, read, write etc
  - Memory management :- mmap, brk etc
  - Process Control :- fork, exec etc
  - IPC :- signal, kill etc

THANK YOU

Chandravva Hebbi
Department of Computer Science and Engineering