

Linux System Programming (LSP)

Course Objective

This system-programming course covers system programming for the UNIX/POSIX environment utilizing ANSI C. Emphasis is on the UNIX/POSIX system calls for I/O, process control, multithreading, interprocess communication. Different I/O techniques are contrasted and standard C library I/O functions and UNIX system calls are presented in detail. Students acquire the knowledge needed to effectively exploit the features of the UNIX/POSIX environment.

Course Content

Program Development Review

Editing
 Compiling and Linking
 Debugging
 Tracing
 Core Dumps
 Using the /proc Filesystem
 Using /dev/kmem
 Attaching Background Processes

Multiprocessing & Multithreading

Decision Criteria
 A Look Inside a Process
 Thread Creation & Destruction
 Thread Synchronization
 Process Creation & Destruction
 Foreground and Background Processes
 Zombie Processes
 Signal Handling

Linux Memory Management

System Memory vs. Process Memory
 Memory
 Dynamically Allocating Additional Storage
 Shared Libraries
 Memory mapped files

UNIX/POSIX Files and File System

File System
 Mount Points vs. Drive Letters
 /proc File System

/var File System
 Network File Systems (NFS, SMB and CIFS)
 Various types of files

File I/O

Stream I/O (Application Buffered)
 Opening and Closing Files
 Stream based I/O
 File Descriptors vs. File Handles
 Opening and Closing Files
 Reading and Writing Files
 Positioning Within a File
 Managing I/O Buffering
 Connecting Standard Input or Output to Files
 File Locking

Local Interprocess Communication

Using Signals for Interprocess Communication
 Criteria for Choice
 Catching Signals
 Sending Signals
 Kernel IPC Facilities
 Shared Memory
 Semaphores
 Message Queues
 Managing Kernel IPC Resources
 Pipes
 Pipe Lines
 Named Pipes



Concepts Systems Educational Services
602-603, The Pentagon, Shahu College Road,
Next to Pune-Satara Road, Near Panchami Hotel
Parvati. Pune - 411009.

Contact No. +91 20 2421 6888, +91-99606 38738

Reference:

Advance Linux Programming

Richard Stevens

Advance Linux Programming
Code Sourcery LLC

Prerequisite:

Fluent C Programming

Algorithms & Data Structures

Sound Operating System Fundamentals

Familiarity with Linux environment