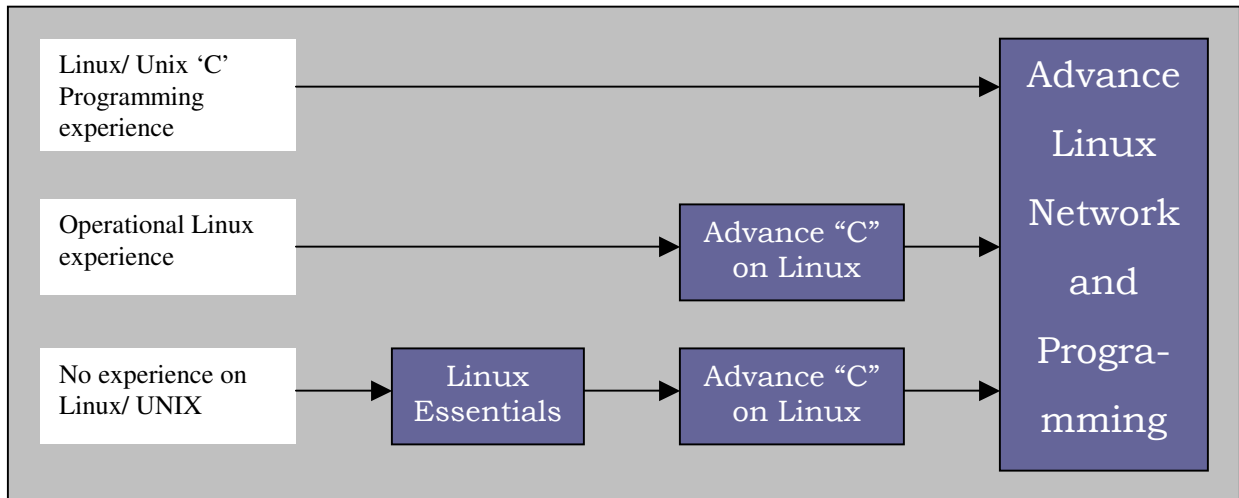


Concepts Systems

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Concepts Certified Linux Programmer



Linux Essentials

Course Objective

This course is for beginners who are new to Linux and want to be power user of the operating system. This course offers you the opportunity to build user-level skills before learning Linux System Programming. Hands on labs and exercises introduces you to different facets of the Linux operating system.

Course Content

Introduction to Linux

OS Concepts
GNU / GPL Licensing
Evolution of Linux
Types of Shell
X Window System

Installation and configuration

Installation
Hard Disk Partitioning details
System customization & upgrades
Automated kickstart Installation

Package Installation, Upgrade,
Boot Loaders, LILO, GRUB
Uninstallation,
Configuring X

Linux File Systems

Ext2 / Ext 3
NFS Installation & Configuration
Static mount & Automount configuration
Directory structure
Troubleshooting NFS
Configuring RAID, LVM,

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Learning Editors

VI,
Emac,
Pico

Shell Commands

Directory & File Operation
User Management
Printer Management
Tar / Rpm Commands
File / Directory Access control

Linux Networking

Basic concepts of Networking
DNS concepts, Mail Server Configuration,
Apache Configuration,
TCP/IP protocol suit, DHCP
IP Addresses, Netmask, subnet
Network services & tools, telnet, ftp, ssh,
rsh, cron, CUPS,

Integrating Windows & Linux

NetBIOS, SMB/CIFS protocols

Prerequisite:

User level experience of any operating system

Domain
Controller
File Sharing & Printing
Samba Installation & Configuration

Linux Startup & Shut down

Bootup & login sequence,
System Run Levels
Adding and Removing service
Scheduled jobs
Syslogd configuration

Network Programming

Introduction to Shell scripts
Uploading or Downloading using
FTP (shell script)
Establishing Connection through Telnet, ssh,
rsh (shell script)

Troubleshooting

Bootloader
Boot Process
Service related problems
Network related problems

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Advance C Programming

Course Objective

This course is intended for programmers having experience of writing solid code. The course discusses coding techniques used by best “C” programmers. Main objective of the course is to discuss many aspects of C--from how memory is laid out to the details of pointers and arrays, how linkers work and how executable are structured. This course prepares strong foundation before one starts with cryptic kernel programming.

Course Content

- | | |
|--|---|
| <ul style="list-style-type: none">• Introduction to C standards• Declaration & Definitions in depth• Struct ,enums, typedefs, #define• Bitwise Arithmetic (with tricky programs)• Precedence & Associativity• Introduction to Lint• Arrays & Pointer Arithmetic• Is Array same as pointers?• Pointers for Multidimensional arrays, Dynamic arrays• Function Pointers etc.• Unscrambling dynamic allocation• Implement malloc & free• Libraries Linking & Loading | <ul style="list-style-type: none">• Dynamic linking• Runtime System• Segments & Executables• O.S and a.out• Standard calling conventions• Activation Records• X86 Memory Architecture & C• Debugging Memory Leaks &• Segmentation Faults• Type Casting |
|--|---|

Reference:

The C Programming Language, Second Edition
Brian W. Kernighan and Dennis M. Ritchie.

Prerequisite:

Basic C programming

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Linux Network and Programming

Course Objective:

Network programming on Linux course covers system networking, TCP/IP fundamentals and programming network applications on Linux. This course also gives introduction to programming internals on Linux with an in-depth overview of Processes, Threads and Signals programming. Emphasis is given on writing client-server applications and solid understanding of the implementation of networking layer of the Linux kernel.

Course Content

Basic Concepts

Types of networks
Layering Principles
OSI, TCP/IP Reference model
Internet Addresses
IP v4 v5 v6 Classes
Domain name system
Client-Server model
Port Numbers

Processes and Signals

Process and Process Environment
Process Creation & Destruction
Foreground and Background Processes
Signal Handling
Programming processes and signals
Posix Signal Handling
SIGCHLD Signals
Wait and Waitpid Functions

Interprocess Communication

Basic Concepts
Pipes
Named Pipes
FIFO's
Message Queues
Shared memory

Introduction To Sockets

Introduction to Linux domain Sockets
Socket address structures
Byte ordering functions.
Socket related functions.

TCP Sockets

Introduction
socket function
connect function
bind function
listen function
accept function
fork and exec function
Close function

TCP Client-Server Example

TCP Echo server
TCP Echo Client
Normal Startup
Normal Termination

Socket options

Introduction
getsockopt and setsockopt functions
Socket states

UDP Sockets

Introduction
recvfrom and sendto functions
UDP Echo server
UDP Echo Client

Raw Sockets

Threading

Basic Concepts
Programming Posix threads

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Thread Communication
Thread Synchronization

Mutex & Semaphores

Client Server Application Design

Multithreaded Concurrent Servers
Interactive Servers

Prerequisite :

Fluent C Programming
Algorithms & Data Structures
Basic Network Concepts such as LAN/ WAN etc.



Telnet,
Netstat, TFTP & POP3

Tools

Kernel tuning
Problem analysis tools
Performance monitoring tools
E.g. Etheral, spray, netstat etc.