



LINUX TRAINING

Advanced Linux Programming Administration Course

Elevate your Linux skills. Learn advanced programming and administration techniques for powerful system development and optimization.

DURATION

2 hours

LEVEL

Intermediate

FORMAT

Instructor-Led

- Globally Recognized Certification

- Expert-Led Hands-On Training

- Flexible Scheduling

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COURSE OVERVIEW

The Advanced Linux Programming Administration Course is meticulously designed for IT professionals seeking to elevate their proficiency from foundational Linux administration to advanced system programming and robust system management. This course dives deep into the intricate mechanisms of the Linux kernel, equipping participants with the knowledge to develop powerful, efficient, and reliable applications directly interacting with the operating system. You will master critical skills such as system call programming, inter-process communication, network socket programming, and advanced shell scripting for sophisticated automation tasks.

This intensive program goes beyond conventional administration, focusing on practical programming techniques in C and leveraging core Linux APIs to build high-performance solutions. By understanding the underlying architecture and programming paradigms, you will gain the ability to diagnose complex system issues, optimize resource utilization, and architect scalable solutions. The professional benefits are immense, including enhanced problem-solving capabilities, the capacity to develop custom system tools, and the strategic advantage of contributing to enterprise-level infrastructure projects with unparalleled expertise.

Duration	2 hours
Level	Intermediate
Vendor	Linux

COURSE CURRICULUM

01 Module 1: Advanced Shell Scripting and System Automation

- Review of advanced Bash features: arrays, associative arrays, functions, traps
- Regular expressions for pattern matching and text manipulation (grep, sed, awk)
- Advanced I/O redirection and process substitution
- Developing robust and error-handling scripts
- Integrating scripts with system services and cron jobs

02 Module 2: Linux System Programming Fundamentals with C

- Introduction to C programming for Linux systems
- System calls vs. library functions
- File I/O: open, read, write, close, lseek, stat
- Error handling and debugging with gdb
- Memory management: malloc, free, stack vs. heap

03 Module 3: Process and Thread Management

- Process creation and management: fork, exec, wait
- Zombie and orphan processes
- Signals: sending, catching, ignoring
- Introduction to POSIX threads (pthreads)
- Thread synchronization: mutexes, condition variables, semaphores

04 Module 4: Inter-Process Communication (IPC)

- Pipes and Named Pipes (FIFOs)
- Shared Memory: shmget, shmat, shmdt
- Message Queues: msgget, msgsnd, msgrcv
- Semaphores for resource protection

- IPC design patterns and best practices

05 Module 5: Network Programming with Sockets

- Introduction to TCP/IP and socket programming concepts
- Socket types: stream (TCP) and datagram (UDP)
- Client-server model: socket, bind, listen, accept, connect
- Sending and receiving data over sockets
- Concurrent servers: using fork and threads with sockets

06 Module 6: Advanced System Administration and Performance Tuning

- System monitoring tools: strace, ltrace, tcpdump, netstat
- Kernel parameters tuning for performance (sysctl)
- Resource limits (ulimit) and cgroups
- Advanced logging and auditing techniques
- Introduction to kernel modules development (conceptual overview)

CAREER PATHWAYS

Graduates of this program are prepared for the following roles:

- > **Senior Linux Systems Engineer responsible for infrastructure development and optimization.**
- > **DevOps Engineer specializing in automating complex deployment pipelines and system configurations on Linux.**
- > **Embedded Systems Programmer developing low-level applications and drivers for Linux-based devices.**

FREQUENTLY ASKED QUESTIONS

Q: How does this course enhance my ability to develop custom tools and automate complex Linux system tasks?

This course provides a deep dive into Linux system calls, C programming, and advanced shell scripting. You will learn to directly interact with the operating system at a low level, enabling you to build highly optimized custom utilities, automate intricate administrative workflows, and write robust scripts that go beyond typical command-line operations, ultimately allowing you to create tailored solutions for specific organizational needs.

Q: What are the essential prerequisites for enrolling in the Advanced Linux Programming Administration Course?

To get the most out of this course, participants should have a solid intermediate understanding of Linux command-line administration, including file system navigation, user management, and service control. Prior experience with a programming language, preferably C or Python, and basic scripting knowledge is highly recommended, as the course extensively covers system programming concepts.

Q: Beyond basic network administration, what advanced programming paradigms related to networking will I master in this course?

This course will equip you with the skills to master socket programming, enabling you to develop network-aware

applications from scratch. You will learn to implement both TCP and UDP client-server models, handle concurrent network connections, and understand the intricacies of network protocols at the programming level, which is crucial for building custom network services or sophisticated monitoring tools.

ABOUT COMPUTER PRIDE



East Africa's Premier IT Training Center

With over 15 years of excellence, Computer Pride delivers globally recognized certification programs from leading technology vendors. Located on Kenyatta Avenue in Nairobi's CBD, our state-of-the-art facilities and expert instructors have empowered thousands of professionals across East Africa.

15+

Years of Excellence

10,000+

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READY TO ENROL?

Take the next step in your technology career.

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