Document Generated: 05/04/2026

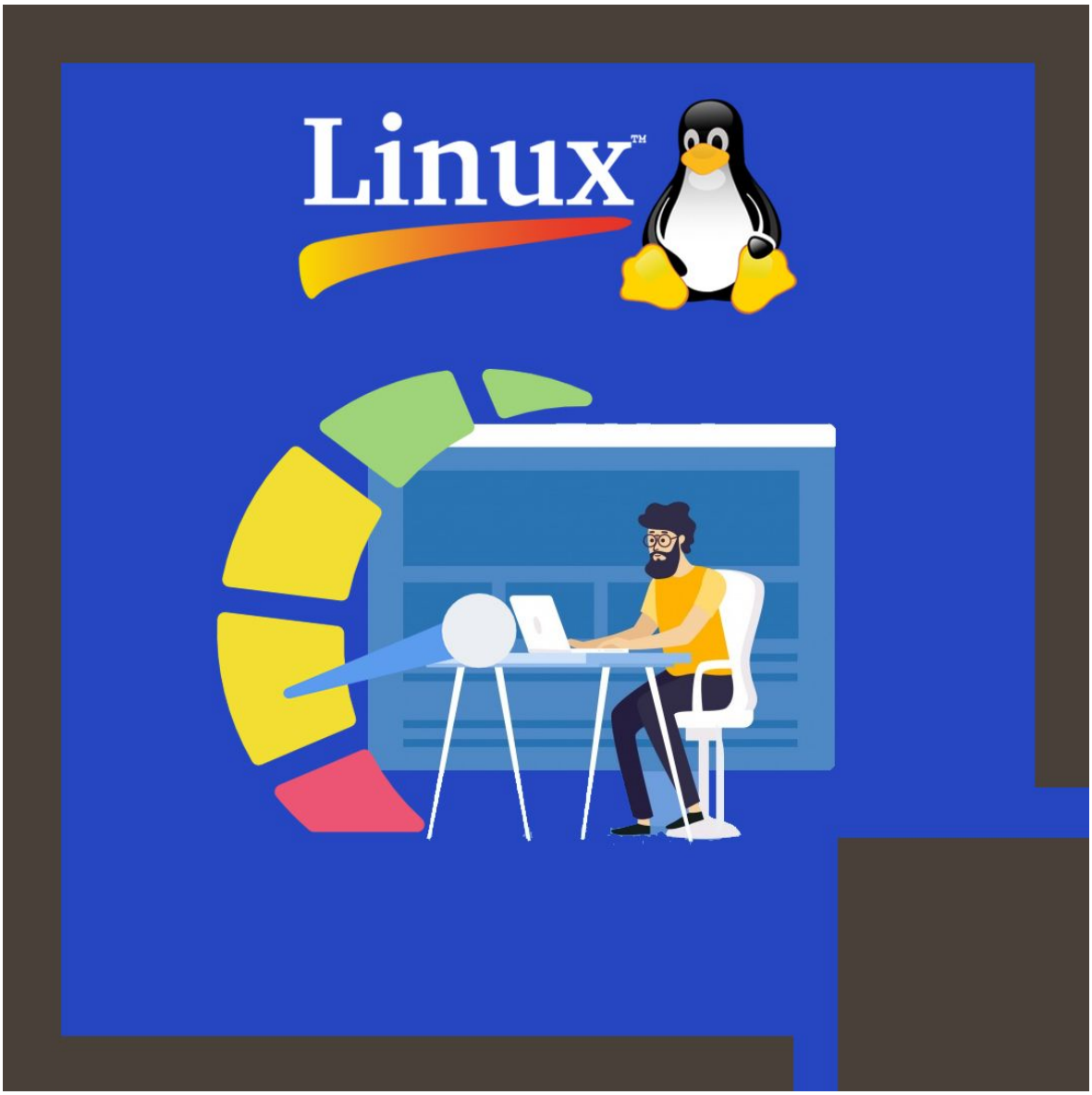
Learning Style: Virtual Classroom

Technology: Linux Foundation

Difficulty: Intermediate

Course Duration: 4 Days

Linux Performance Tuning (LFS426)



About this course:

Keeping your Linux systems running optimally is a mission-critical function for most Linux IT professionals. This course will teach you the appropriate tools, subsystems, and techniques you need to get the best possible performance out of Linux.

This course is designed to give you all the tools and techniques you need to keep your Linux systems running at optimal levels. These techniques and tools have been developed and tested in the most demanding high-performance computing environments.

This course is designed to work with a wide range of Linux distributions, so you will be able to apply these concepts regardless of your distro.

The average salary of a Linux System Administrator is **$70,057** per year.

Course Objective:

In this course, you'll learn:

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- Industry configuration best practices
- The best tried-and-true optimization performance tuning tools and techniques
- How to manually optimize the kernel's behavior
- Tracing, profiling and instrumentation techniques across a wide range of conditions
- And more.

Audience:

- Linux System Administrators

Prerequisite:

- his course is primarily intended for system administrators and technology architects who need to select and tune their environment to maximize speed and efficiency. Students should be experienced Linux users. Familiarity with local system administration concepts covered in LFS301 Linux System Administration is required.

Course Outline:

Introduction

- Linux Foundation
- Linux Foundation Training
- Linux Foundation Certifications

- Laboratory Exercises, Solutions and Resources
- Distribution Details
- Labs

Performance Optimization Principles

- Methodology
- Optimization Process
- Investigation Tools
- Labs

Benchmarking

- Performance Benchmarks
- Synthetic Benchmarks
- Application Benchmarks
- Labs

Tuning Interfaces

- Tuning Concepts
- Kernel Tunables
- Kernel Parameters
- Application Interfaces
- tuned
- Hardware Tunables
- Labs

Monitoring Interfaces

- /proc Filesystem
- Command-line Utilities
- Performance Data Collection
- Nagios
- Ganglia
- Kernel Monitoring
- Labs

Profiling Techniques and Tools

- Performance Monitoring
- Counters
- Performance Ratios
- Kernel vs Application Profiling
- oprofile
- Perf
- Available perf events
- Acquiring Performance Data with perf
- Monitoring Performance from Within the Application
- User Space Performance Monitoring with gprof

- Labs

Tracing Tools

- User Space Tracing
- strace
- Library Tracing
- Kernel Tracing
- ftrace
- SystemTap
- Tracing Applications with SystemTap
- Labs

CPU Subsystem

- CPU Concepts and Architecture
- CPU-Level Optimizations
- Specialized Instruction Sets
- CPU Topology
- BIOS Settings
- Labs

Power Management

- Power Management Strategies
- Device Power Management
- CPU Power Saving States
- Frequency Scaling
- Power Management Tools
- Labs

Process Scheduling

- Design
- Scheduling Policies
- Scheduling Tunable Settings
- CPU Affinity and Isolation
- Interrupt Affinity
- Control Groups
- Labs

Memory Subsystem

- Overview
- Page Lookup Optimization and Huge Pages
- Controlling Swapping from Applications
- Minimizing Faults
- Labs

NUMA Optimizations

- CPU Concepts and Architecture
- NUMA Memory Allocation
- NUMA Statistics
- Labs

I/O Subsystem

- Storage Stack Overview
- I/O Scheduler Concepts
- I/O Scheduler Algorithms
- Hardware Considerations
- Tuning Storage Devices
- Labs

Local Filesystems

- Major Filesystem Choices
- Ext3/4 Journaling Modes
- Filesystem Attributes
- Labs

Network Filesystems

- Network File System (NFS)
- NFSv4
- pNFS
- Labs

Storage and IO

- Software RAID Refresher
- RAID Levels
- RAID configuration
- Logical volumes
- Volumes and Volume Groups
- Creating Logical Volumes
- Raw Devices
- Asynchronous I/O
- Labs

Analyzing the I/O Subsystem

- iostat
- iotop
- blktrace
- blkparse
- btrace
- btt
- blkiomon
- Labs

Network Subsystem Optimization

- Network Stack Overview
- Optimizing for Latency and Throughput
- Network Interface Hardware Settings
- Offloading Techniques
- TCP Optimization
- Monitoring and Diagnostic Tools
- Labs

Virtualization

- Virtualization Overview
- Disk Considerations
- Network Considerations
- Labs

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