Document Generated: 07/08/2026

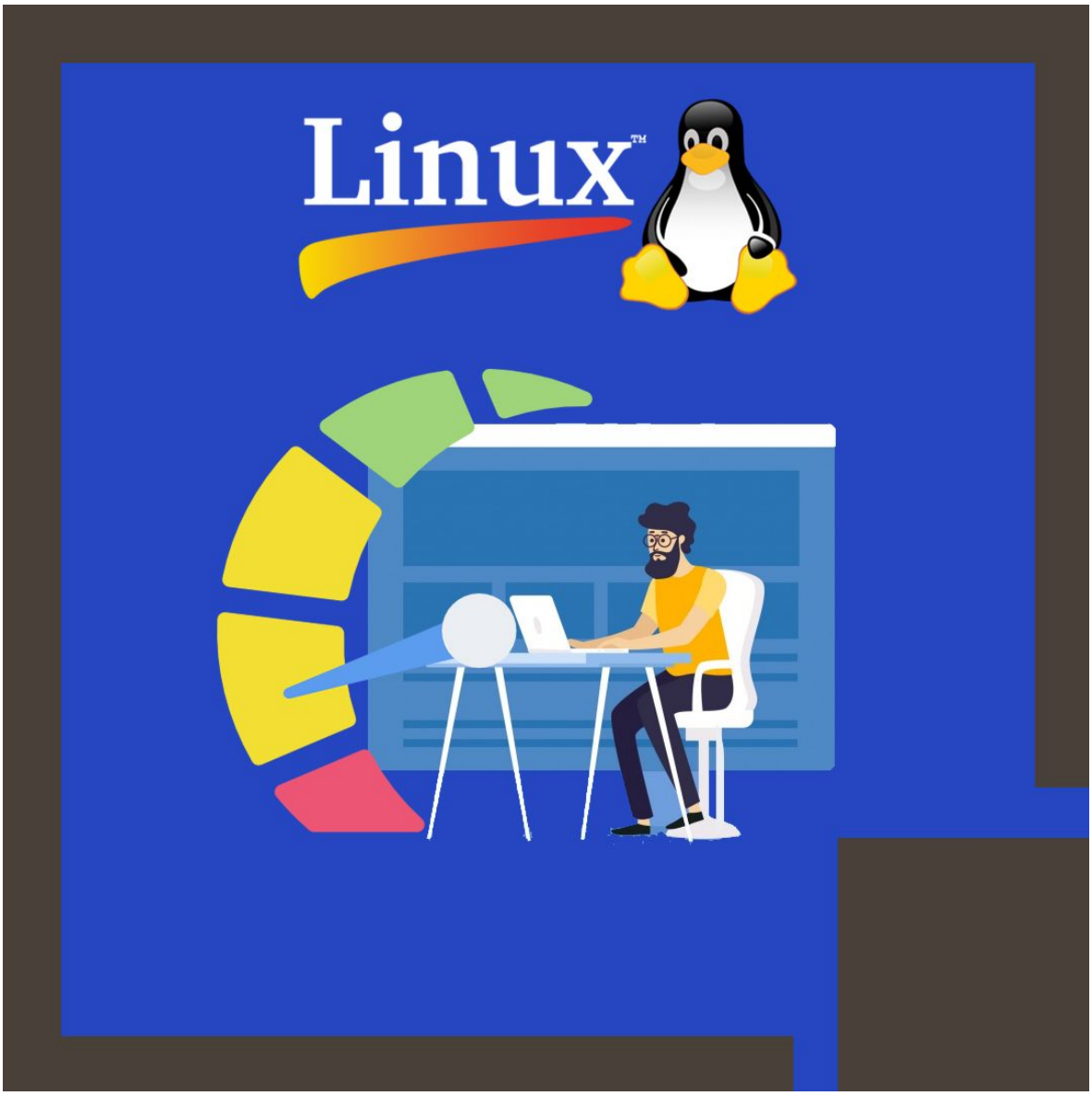
Learning Style: Virtual Classroom

Technology: Linux Foundation

Difficulty: Intermediate

Course Duration: 4 Days

Linux Performance Tuning (LFS426)



About this Course:

Linux is the leading operating system for web servers, consumer electronics, smartphones, and cloud computing. The continuous growth and expansion of the IT industry have created a drought of Linux System Administrators. Businesses are direly in need of proficient Linux Professionals who can fine-tune Linux System Performances and maximize efficiency & speed. A Linux System Administrator earns $70,057 annually and can easily secure a highly reputable job.

This course provides an in-depth overview of the basics tools & techniques used in optimizing Linux System Performance and Administration. Professionals will learn to better maintain Linux systems and make it operate at optimal levels. The techniques and practices instructed in this course are tested and suited to most-demanding computing ecosystems. The teachings of this course align with a broad group of Linux Distributions and professionals also learn the art of effective Linux System Implementation.

Course Objectives:

The core objective of this course is to help professionals develop a better understanding and sound knowledge of the following key concepts:

- Linux Monitoring Tools and Techniques
- Configuration Management Best Practices in Linux
- Kernels Behavior’s Manual Optimization
- Linux Systems Profiling, Tracing, and Instrumental Techniques
- Optimizing Linux Distributions and Maximizing Efficiency & Speed

Audience:

This course is specifically tailored for the following group of professionals and interested candidates:

- Linux System Administrator
- Technology Architects & System Administrators
- Professionals interested in Linux Systems Optimization & Improving Speed & Efficiency

Prerequisites:

Professionals planning to enroll in the Linux Performance Tuning (LFS426) course must comply with the following prerequisites:

- Practical Knowledge of working with Linux Operating Systems
- Conceptual Know-how of the Core Concepts of Local System Administration
- Familiarity with the key concepts covered in Linux System Administration (LFS301)

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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