RH442 Red Hat Enterprise System Monitoring and Performance Tuning

Course Summary

Description

The course is designed to teach the methodology of performance tuning and capacity planning for Red Hat Enterprise Linux. This course covers system architecture, performance characteristics, monitoring, benchmarking, and network performance tuning.

Topics

- Basics: Principles and Terminology
- Tools for Obtaining Information
- Monitoring the Kernel
- Hardware Performance Considerations
- The CPU: Processes and Scheduling
- Memory
- The I/O Subsystem and Filesystems
- Network Performance
- Application Tuning

Audience

This course is aimed at senior Red Hat Enterprise Linux system administrators and other IT professionals working in enterprise environments and mission-critical systems.

Prerequisites

Students should already be familiar with Red Hat Enterprise Linux. The minimum competency level for this course is completion of the RHCE or equivalent knowledge.

Duration

Four days

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Course Outline

I. Basics: Principles and Terminology
- A. What is performance tuning?
- B. Steps in the tuning process
- C. Quantifying performance

II. Tools for Obtaining Information
- A. The sysfs and proc filesystems and the sysctl utility
- B. System process queues
- C. The system activity reporter
- D. Passing parameters to kernel modules
- E. Generating reports using standard utilties
- F. Benchmarking
- G. Monitoring systems with SNMP and MRTG

III. Monitoring the Kernel
- A. Kernel profiling and OProfile
- B. Monitoring the kernel with SystemTap

IV. Hardware Performance Considerations
- A. Memory: levels, types
- B. Cache
- C. Disk and I/O

V. The CPU: Processes and Scheduling
- A. Controlling processor speed
- B. How the Linux kernel schedules processes
- C. Process priority
- D. Obtaining processor performance information

VI. Memory
- A. How Processes and the kernel utilize memory
- B. System tunables that affect memory performance
- C. How page and buffer caches work
- D. Monitoring and controlling memory usage
- E. The virtual memory subsystem

VII. The I/O Subsystem and Filesystems
- A. Tuning the disk I/O subsystem
- B. I/O scheduling
- C. The virtual file system
- D. File system tunable parameters
- E. Layout of the ext2 and ext3 filesystems
- F. Journaling

VIII. Network Performance
- A. Factors affecting performance
- B. Viewing device information
- C. Ethernet channel bonding
- D. Network sockets
- E. Layers of the OSI model
- F. TCP tuning

IX. Application Tuning
- A. Causes of performance problems
- B. Application tuning
- C. Viewing application behaviors using standard tools
- D. NFS
- E. Apache
- F. Samba

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