

System Administration Troubleshooting Course Summary

Description

This course delves into the many areas of administrative concern for Linux administrators. This course is for help-desk and LAN administrators who are supporting Red Hat Enterprise Linux (RHEL) on an Intranet network. Students are shown how to recover from boot up errors, system initialization errors, partition and file system errors, file and permission errors, configuration errors, networking errors and issues, software errors, and kernel errors. These are the common errors new administrators face on an irregular basis.

The course lets students discover the various issues of managing and maintaining Red Hat Enterprise Linux (RHEL), and via hands on exercises, progressively adds the tools and tips for recovery as each area of trouble is examined.

The starting point is in developing a working knowledge of the various system configuration files and establishing baseline knowledge of your system for comparison, understanding how to establish the baseline for any given RHEL system and how to find and recover changes to your system relative to the baseline. From there students are shown the regular areas of system management, the related various errors and tips on troubleshooting these errors.

This course does not cover Internet facing network services such as DNS, DHCP, e-mail and proxy services. Sophisticated network attacks are also NOT considered.

Objectives

At the end of this course, students will be able to:

- Know Can Go Wrong On Any System
- Use troubleshooting concepts, techniques and procedures
- Use Common utilities for monitoring systems
- Local and Network Boot Troubleshooting
- Work At GRUB Command Line
- File System Recovery Options and Tips
- LVM and RAID Recovery Options
- Network Service Failures and Tracking
- Local and Remote Log Management
- Service/Daemon Script Troubleshooting
- Interpret system logs for clues to mysteries
- Ensure Change Control of Critical system files
- Check, Query and Recover software packages
- Perform basic performance, memory, and process management
- Deal with Kernel issues including memory dumps
- Recover from common troubleshooting issues

Topics

- Linux Troubleshooting Overview
- Bootup Troubleshooting
- Troubleshooting Utilities
- Software Management using RPM, YUM
- Log Files
- Logical Volume Management
- Linux Filesystem problems and recover
- System Initialization and Service troubleshooting
- Network Configuration Issues
- Kernel Modules and Troubleshooting Tips
- Monitoring Tools
- Application Core Dumps
- Kernel Core Dumps
- Software and application troubleshooting

System Administration Troubleshooting Course Summary (cont'd)

Audience

This is fast paced, boot camp style, hands-on course designed specifically for Red Hat Administrators (RCHT and above) with a fair level of Linux experience wanting to develop significant new technical abilities. All Linux support staff, administrators, operators, help-desk staff and networking specialists would benefit from this course.

This course is more effective than months of on the job training and individual study.

Prerequisites

This course assumes students have a minimum knowledge level of basic administration of a Red Hat Enterprise Linux (RHEL) host equivalent to the SA2 class or RH131/RH133.

This course is also for anyone with years of experience administering any other UNIX variant (HP-UX, Solaris, etc.) who wants to understand some of the Linux specifics.

Students should already be well versed in networking and network services, users, user accounts, installation, setup and security on any RHEL operating system version. This means students should have 3-6 months minimum experience with working with Red Hat Enterprise Linux installing, configuring and managing users and software. Programming experience would be an asset as well.

Duration

Three full days or five half days

System Administration Troubleshooting Course Outline

- I. Introduction to Troubleshooting**
 - A. Bootup Troubleshooting
 - B. System Initialization Troubleshooting
 - C. System Monitoring and Troubleshooting
 - D. Software Monitoring and Troubleshooting
 - E. Core Dumps
 - H. lsof, lsof -i
 - I. strace, ltrace
 - J. rpm and yum: App view
- II. Bootup Troubleshooting**
 - A. GRUB Boot Loader
 - B. Kernel Params: single, confirm, etc.
 - C. Local and Network Booting
 - D. Fibre Channel Booting
 - E. Console Redirect
 - F. Initrd (Initial RAM Disk)
 - G. Kernel Loading
 - H. Kernel Module Loading
 - I. Booting into /sbin/init
- III. System Initialization Troubleshooting**
 - A. /sbin/init Troubleshooting
 - B. Runlevel Dependencies
 - C. Kernel Ring Buffer
 - D. syslogd and klogd
 - E. Log File Locations
 - F. Service/Daemon Troubleshooting
 - G. Networking Init and Troubleshooting
- IV. System Monitoring**
 - A. Process, Mem, I/O Monitoring
 - B. Key Log Files
 - C. Hardware Monitoring
 - D. rpm and yum: Sytem view
 - E. RAID and External Disks
- V. Application/Daemon Troubleshooting**
 - A. CPU Usage
 - B. Memory Usgae
 - C. I/O Usage
 - D. Execution Tracing
 - E. File Access Troubleshooting
 - F. top, ps, pstree, pmap, etc.
 - G. /proc/PID Info
- VI. Core Dump Debugging**
 - A. Application Core Dumps
 - B. App Segmentation Faults
 - C. Kernel Core Dumps
 - D. gdb Debugger
 - E. crash Debugger
- VII. Logical Volume Manager Troubleshooting**
 - A. Adding additional disk space
 - B. Partitioning disk space
 - C. Physical Volumes
 - D. Volume Groups
 - E. Logical Volumes
- VIII. Appendix**
 - A. VMWare Player Usage on Windows

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