KOENIG
step forward

KOENIG SOLUTIONS · COURSE OUTLINE

Linux Troubleshooting (L-314)

Learn to diagnose and resolve Linux system, network, storage and application issues using standard troubleshooting tools and methods.

10	128	9
MODULES	TOPICS	HANDS-ON LABS

COURSE OVERVIEW

This course covers a structured approach to troubleshooting Linux systems, beginning with methodology, documentation and common diagnostic tools such as RPM queries, strace, lsof and network utilities like tcpdump and nmap. It then addresses rescue environments, recovery from damaged MBRs and deleted files, and the boot process including GRUB 2, systemd and process management. Further modules examine filesystem, backup, networking, X11, logging, RPM and printing issues, followed by user and access management topics such as PAM, quotas, FACLs and SELinux. The remaining modules cover storage technologies including LVM, RAID and multipathing, directory services such as LDAP and NIS, and application-level troubleshooting for DNS, Apache, FTP, Squid, Samba, Postfix, mail protocols and MariaDB.

WHO THIS COURSE IS FOR

- **System Administrators**
- **Linux Administrators**
- **Network Administrators**
- **Support Engineers**
- **Infrastructure Engineers**

LEARNING OBJECTIVES

- Apply a structured troubleshooting methodology to Linux problems
- Identify and use common diagnostic tools such as strace and lsof
- Describe recovery procedures using rescue environments and chroot
- Analyse boot process issues involving GRUB 2 and systemd
- Diagnose filesystem, backup and network configuration problems
- Assess access control issues involving PAM, FACLs and SELinux
- Evaluate storage issues across LVM, RAID and multipathing
- Troubleshoot application services such as Apache, DNS and Samba

COURSE SYLLABUS

10 Modules, 128 Topics

01

Troubleshooting Methodology

TOPICS

The Troubleshooting Mindset · Evaluating Possible Solutions · Identifying and Implementing Change · Define and Follow Policies · Working with Others · Finding Documentation · Finding Help Online

02

LAB

Troubleshooting Tools

TOPICS

- Common Troubleshooting Tools
- RPM Queries
- RPM Verification
- SRPM and spec Files
- Hardware Discovery Tools
- Configuring New Hardware with hwinfo
- strace and ltrace
- lsof and fuser
- ipcs and ipcrm
- iostat, mpstat, and vmstat
- Using hdparm to Measure
- Troubleshooting with the ip command
- Name Resolution
- ss/netstat and rpcinfo
- nmap
- Netcat
- tcpdump and wireshark
- Troubleshooting with rpm
- Process Related Tools
- Network Tools

03

LAB

Rescue Environments

TOPICS

Diagnostic/Recovery · Rescue Procedures · **Recovery:** mount & chroot · Recovery Examples · **Recovery:** Network Utilities · Recovering Damaged MBR · Recover from Deleted Critical Files

04

LAB

Topic Group 1

TOPICS

- Linux Boot Process
- System Boot Method Overview
- systemd System and Service Manager
- Using systemd
- Booting Linux on PCs
- Troubleshooting With GRUB 2
- Boot Process Troubleshooting
- **Troubleshooting:** Linux and Init
- Process Management
- Process Management Tools
- Troubleshooting Processes: top
- Filesystem Concepts
- Filesystem Troubleshooting
- Backup Concepts
- Backup Troubleshooting
- Backup Troubleshooting

05

LAB

Topic Group 2

TOPICS

- Networking Tools
- Linux Network Interfaces
- Networking Commands Review
- NetworkManager
- Networking Troubleshooting
- Networking Troubleshooting
- Virtual Interfaces/IP Aliases
- Network Teaming
- Xinetd Concepts
- Xinetd Troubleshooting
- TCP Wrappers Concepts
- TCP Wrappers Concepts
- TCP Wrappers Troubleshooting
- Netfilter/iptables Concepts
- Netfilter/iptables Troubleshooting

06

LAB

Topic Group 3

TOPICS

- X11 Concepts
- X11 Server Operation
- X11 Troubleshooting
- Rsyslog Concepts
- System Logging
- systemd Journal
- systemd Journal's journactl
- Secure Logging with Journal's Log Sealing
- Syslog Troubleshooting
- RPM Concepts
- RPM Troubleshooting
- Common Unix Printing System (CUPS)
- CUPS Troubleshooting
- CUPS Troubleshooting
- at & cron
- at & cron Usage
- at & cron Troubleshooting

07

LAB

Topic Group 4

TOPICS

- Users and Groups
- Users and Groups Troubleshooting
- PAM Concepts
- PAM Troubleshooting
- Filesystem Quotas
- Quotas Troubleshooting
- File Access Control Lists
- FACL Troubleshooting
- SELinux Concepts
- SELinux Troubleshooting
- SELinux Troubleshooting Continued

08

LAB

Topic Group 5

TOPICS

- Kernel Modules
- Kernel Modules Troubleshooting
- Logical Volume Management
- Creating Logical Volumes
- LVM Deployment Issues
- VG Migration, PV Resizing & Troubleshooting
- Software RAID Overview
- RAID Troubleshooting
- Multipathing Overview
- SAN Multipathing
- Multipath Configuration
- Multipathing Best Practices
- LDAP and OpenLDAP
- Troubleshooting OpenLDAP
- NIS and NIS+ (YP)
- NIS Troubleshooting Aids

09

LAB

Topic Group 6

TOPICS

- DNS Concepts
- DNS Troubleshooting
- DNS Troubleshooting
- Apache Concepts
- Apache Troubleshooting
- Apache Troubleshooting
- FTP Concepts
- FTP Troubleshooting
- Squid Concepts
- Squid Troubleshooting

10

LAB

Topic Group 7

TOPICS

- Samba Concepts
- Samba Troubleshooting
- Postfix Concepts
- Postfix Troubleshooting
- Postfix Troubleshooting
- IMAP & POP Concepts
- IMAP/POP Troubleshooting
- MariaDB
- MariaDB Troubleshooting

HANDS-ON LABS

Practise What You Learn

#	MODULE	ACTIVITY
02	**Troubleshooting Tools**	Determining the System's Configuration
03	**Rescue Environments**	Recovery Runlevels
04	**Topic Group 1**	**Troubleshooting Problems:** Topic Group 1
05	**Topic Group 2**	**Troubleshooting Problems:** Topic Group 2
06	**Topic Group 3**	**Troubleshooting Problems:** Topic Group 3
07	**Topic Group 4**	**Troubleshooting Problems:** Topic Group 4
08	**Topic Group 5**	**Troubleshooting Problems:** Topic Group 5
09	**Topic Group 6**	**Troubleshooting Problems:** Topic Group 6
10	**Topic Group 7**	**Troubleshooting Problems:** Topic Group 7

WHAT IS INCLUDED

Everything You Need to Succeed

- Koenig course material for every module
- Delivery by certified instructors and subject matter experts
- Hands-on exercises throughout the course
- Course completion certificate from Koenig

ABOUT KOENIG

Who We Are

Established in 1993, Koenig Solutions is a globally recognised training provider with 35+ technology partnerships, 5,000+ training programmes and a network of certified instructors and subject matter experts, supporting individuals and enterprise teams worldwide.

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