

KOENIG SOLUTIONS • COURSE OUTLINE

LPIC-2 Course 1

Learn to administer Linux systems, covering kernel compilation, boot processes, filesystems, LVM, RAID, storage, networking and system maintenance.

9

MODULES

148

TOPICS

34

HANDS-ON ACTIVITIES

COURSE OVERVIEW

This course covers Linux capacity planning and performance monitoring, followed by the boot process, SysV init, systemd, and system recovery and bootloaders. It then addresses kernel components and compilation, filesystem administration, logical volume management and RAID, and adjusting storage device access including iSCSI. The final modules cover client networking configuration and diagnostics, and ongoing system maintenance tasks such as messaging, archiving, compression and backups.

WHO THIS COURSE IS FOR

System Administrators

Network Administrators

Linux Engineers

Storage Administrators

IT Support Technicians

LEARNING OBJECTIVES

- Analyse system resource usage with tools such as top, sar and lsof
- Explain the Linux boot process and configure GRUB 2
- Compare SysV init and systemd service management
- Apply recovery procedures using mount, chroot and rescue tools
- Configure and compile the Linux kernel and its modules
- Administer filesystems, partitions and encrypted volumes
- Implement LVM and RAID storage configurations
- Configure client networking interfaces and diagnose connectivity

9 Modules, 148 Topics

01

2 Lab Tasks

Capacity Planning

TOPICS

- Troubleshooting Resource Usage
- Gathering System Info
- Viewing Processes
- Process Management Tools
- Troubleshooting Processes: top
- Network I/O: iptraf-ng
- uptime & w
- lsof and fuser
- System Status – Memory
- System Status – I/O
- System Status – CPU
- Performance Trending with sar
- Network Monitoring Solutions
- Graphing SNMP Data with MRTG
- Nagios Overview
- Nagios Configuration

02

7 Lab Tasks

Boot Process And SysV Init

TOPICS

- Booting Linux on PCs
- GRUB 2 Configuration
- Boot Parameters
- init
- Linux Runlevels Aliases
- /etc/inittab (Legacy)
- Systemd local-fs.target and sysinit.target
- Typical SysV Init Script (legacy)
- Legacy local bootup script support
- Managing SysV Init Daemons (legacy)
- Controlling SysV Init Service Startup (legacy)
- systemd System and Service Manager
- Modifying systemd services
- Using systemd
- Systemd local-fs.target and sysinit.target
- Systemd basic.target and multi-user.target
- Shutdown and Reboot

03

4 Lab Tasks

System Recovery And Bootloaders

TOPICS

- Diagnostic/Recovery
- Rescue Procedures
- **Recovery:** mount & chroot
- Recovery Examples
- **Recovery:** Network Utilities
- GRUB 2
- systemd-boot & U-Boot
- SYSLINUX
- Network Booting with PXE

Linux Kernel: Components And Compile

TOPICS

- Why Compile?
- Getting Kernel Source
- Preparing to Compile
- Configuring Kernel Compilation Options
- Available Kernel Compile Options
- Compiling the Kernel
- Install Compiled Kernel Modules
- Initial RAM Filesystem
- Tips and Tricks
- Installing the Kernel
- Troubleshooting With GRUB 2
- Boot Process Troubleshooting
- **Troubleshooting:** Linux and Init
- Hardware Discovery Tools
- Configuring New Hardware with hwinfo
- Configuring Kernel Components and Modules
- Kernel Modules
- Handling Module Dependencies
- Dynamic Kernel Module System (DKMS)
- Kernel Modules Troubleshooting
- Configuring the Kernel via /proc/
- udev

Filesystem Administration

TOPICS

- Filesystem Support
- Mounting Filesystems
- Filesystem Table (/etc/fstab)
- AutoFS
- AutoFS Configuration
- Managing Optical Media
- Partitioning Disks with fdisk & gdisk
- Resizing a GPT Partition with gdisk
- Partitioning Disks with parted
- Non-Interactive Disk Partitioning with sfdisk
- Btrfs Introduction
- Filesystem Creation
- Filesystem Maintenance
- smartmontools
- Resizing Filesystems
- Managing an XFS Filesystem
- Swap
- File Encryption With encfs
- Linux Unified Key Setup (LUKS)
- Persistent Block Devices
- List Block Devices

LVM & RAID

TOPICS

- Logical Volume Management
- Implementing LVM
- Creating Logical Volumes
- Activating LVM VGs
- Exporting and Importing a VG
- Examining LVM Components
- Changing LVM Components
- Advanced LVM Overview
- **Advanced LVM:** Components & Object Tags
- **Advanced LVM:** Automated Storage Tiering
- **Advanced LVM:** Thin Provisioning
- **Advanced LVM:** Striping & Mirroring
- **Advanced LVM:** RAID Volumes
- SLES Graphical Disk Tool
- RAID Concepts
- Array Creation with mdadm
- Software RAID Monitoring
- Software RAID Control and Display

Adjusting Storage Device Access And iSCSI

TOPICS

- Tuning with hdparm
- SCSI Devices
- SSD and NVMe Storage
- Remote Storage Overview
- Remote Filesystem Protocols
- Remote Block Device Protocols
- iSCSI Architecture
- Open-iSCSI Initiator Implementation
- iSCSI Initiator Discovery
- iSCSI Initiator Node Administration
- Mounting iSCSI Targets at Boot
- iSCSI Multipathing Considerations

Client Networking

TOPICS

- LPI Objectives Covered
- Linux Network Interfaces
- Ethernet Hardware Tools
- Network Configuration with ip Command
- Configuring Routing Tables
- IP to MAC Address Mapping with ARP
- Network Configuration with ip Command
- Starting and Stopping Interfaces
- IPv6
- Linux Wireless Extensions and Tools
- Wireless Tools Discovery
- NetworkManager
- SUSE YaST Network Configuration Tool
- Network Diagnostics
- Information from ss and netstat
- Discovering Reachable Services
- nmap
- Netcat
- tcpdump and wireshark
- Networking Troubleshooting
- Networking Troubleshooting

System Maintenance

TOPICS

- System Messaging Commands
- Controlling System Messaging
- Archives with tar
- Controlling Login Sessions
- The gzip Compression Utility
- The bzip2 Compression Utility
- The XZ Compression Utility
- Comparing File Changes
- Compiling/Installing from Source
- Tape Libraries
- Backup Software
- Backup Examples

HANDS-ON ACTIVITIES

Practise What You Learn

#	MODULE	ACTIVITY
01	Capacity Planning	■ Process Management Basics ■ Nagios (Web Interface)
02	Boot Process And SysV Init	■ Boot Process ■ GRUB Command Line ■ Basic GRUB Security ■ Managing Services With Systemd's systemctl ■ Creating a systemd unit file ■ Introduction to Troubleshooting Labs ■ Troubleshooting Practice: Boot Process
03	System Recovery And Bootloaders	■ Recovery Runlevels ■ Recovering Damaged MBR ■ Recover from Deleted Critical Files ■ Using SUSE Auto Repair Mode
04	Linux Kernel: Components And Compile	■ Adjusting Kernel Options ■ Linux Kernel Driver Compilation ■ Linux Kernel Compilation
05	Filesystem Administration	■ Accessing NFS Shares ■ On-demand filesystem mounting with AutoFS ■ Hot Adding Swap ■ Creating ISO Images for Backups ■ smartd and smartctl ■ LUKS-on-disk format Encrypted Filesystem

#	MODULE	ACTIVITY
06	LVM & RAID	■ Creating and Managing a RAID-5 Array ■ Creating and Managing LVM Volumes
07	Adjusting Storage Device Access And iSCSI	iSCSI Initiator Configuration
	Client Networking	■ Basic Client Networking ■ Wireless Fundamentals ■ NMAP
08	System Maintenance	■ Command Line Messaging ■ Messaging with talkd ■ Archiving and Compression ■ Using tar for Backups ■ Using cpio for Backups ■ Using rsync and ssh for Backups

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

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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