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Advanced Administration :

1. LINUX KERNEL & DEVICES

1. Hardware Discovery Tools
2. Configuring New Hardware with hwinfo
3. Kernel Hardware Info – /sys/
4. /sys/ Structure
5. udev
6. Managing Linux Device Files
7. List Block Devices
8. SCSI Devices
9. USB Devices
10. USB Architecture
11. Kernel Modules
12. Configuring Kernel Components and Modules
13. Handling Module Dependencies
14. Configuring the Kernel via /proc/
15. Console
16. Virtual Terminals
17. Keyboard & locale configuration
18. Serial Ports
19. Random Numbers and /dev/random

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20. Adjusting Kernel Options
21. Linux Kernel Driver Compilation
22. Introduction to Troubleshooting Labs
23. Troubleshooting Practice: Kernel Modules

2. SYSTEMD OVERVIEW

1. System Boot Method Overview
2. systemd System and Service Manager
3. Modifying systemd services
4. Systemd Service Sandboxing Features
5. systemd Targets
6. Using systemd
7. Linux Runlevels Aliases
8. Legacy Support for SysV init

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9. Managing Services With Systemd's systemctl

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10. Creating a systemd unit file

3. GRUB2/SYSTEMD BOOT PROCESS

1. Booting Linux on PCs
2. GRUB 2
3. GRUB 2 Configuration
4. GRUB 2 Security
5. Boot Parameters
6. Initial RAM Filesystem
7. init
8. Systemd local-fs.target and sysinit.target
9. Systemd basic.target and multi-user.target
10. Legacy local bootup script support
11. System Configuration Files
12. RHEL7 Configuration Utilities
13. SLES12 Configuration Utilities
14. Shutdown and Reboot

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15. Boot Process
16. Booting directly to a bash shell
17. GRUB Command Line
18. Basic GRUB Security
19. Troubleshooting Practice: Boot Process

4. SOFTWARE MAINTENANCE

1. Managing Software
2. RPM Features
3. RPM Architecture
4. RPM Package Files
5. Working With RPMs
6. Querying and Verifying with RPM
7. Updating the Kernel RPM
8. Dealing With RPM & Yum Digest Changes
9. Yum Plugins & RHN Subscription Manager
10. YUM Repositories
11. YUM Repository Groups
12. Compiling/Installing from Source
13. Manually Installed Shared Libraries
14. Rebuilding Source RPM Packages

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15. Managing Software with RPM

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16. Creating a Custom RPM Repository
17. Querying the RPM Database
18. Installing Software via RPM & Source and Rebuilding SRPMs
19. Troubleshooting Practice: Package Management

5. LOCAL STORAGE ADMINISTRATION

1. Partitioning Disks with fdisk & gdisk
2. Resizing a GPT Partition with gdisk
3. Partitioning Disks with parted
4. Non-Interactive Disk Partitioning with sfdisk
5. Filesystem Creation
6. Persistent Block Devices
7. Mounting Filesystems
8. Resizing Filesystems
9. Filesystem Maintenance
10. Managing an XFS Filesystem
11. Swap
12. Filesystem Structures
13. Determining Disk Usage With df and du
14. Configuring Disk Quotas
15. Setting Quotas
16. Viewing and Monitoring Quotas
17. Filesystem Attributes

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18. Creating and Managing Filesystems
19. Hot Adding Swap
20. Setting User Quotas

6. LVM & RAID

1. Logical Volume Management
2. Implementing LVM
3. Creating Logical Volumes
4. Activating LVM VGs
5. Exporting and Importing a VG
6. Examining LVM Components
7. Changing LVM Components
8. Advanced LVM Overview
9. Advanced LVM: Components & Object Tags
10. Advanced LVM: Automated Storage Tiering
11. Advanced LVM: Thin Provisioning
12. Advanced LVM: Striping & Mirroring

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13. Advanced LVM: RAID Volumes
14. SLES Graphical Disk Tool
15. RAID Concepts
16. Array Creation with mdadm
17. Software RAID Monitoring
18. Software RAID Control and Display

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19. Creating and Managing LVM Volumes
20. Creating LVM Thin Volumes
21. Troubleshooting Practice: LVM
22. Creating and Managing a RAID-5 Array

7. REMOTE STORAGE ADMINISTRATION

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2. Remote Filesystem Protocols
3. Remote Block Device Protocols
4. File Sharing via NFS
5. NFSv4+
6. NFS Clients
7. NFS Server Configuration
8. YaST NFS Server Administration
9. Implementing NFSv4
10. AutoFS
11. AutoFS Configuration
12. Accessing Windows/Samba Shares from Linux
13. SAN Multipathing
14. Multipath Configuration
15. Multipathing Best Practices
16. iSCSI Architecture
17. Open-iSCSI Initiator Implementation
18. iSCSI Initiator Discovery
19. iSCSI Initiator Node Administration
20. Mounting iSCSI Targets at Boot
21. iSCSI Multipathing Considerations

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22. Using autofs
23. NFS Server Configuration
24. iSCSI Initiator Configuration
25. Multipathing with iSCSI

8. USER/GROUP ADMINISTRATION

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1. Approaches to Storing User Accounts
2. User and Group Concepts
3. User Administration
4. Modifying Accounts
5. Group Administration
6. Password Aging
7. Default User Files
8. Controlling Login Sessions
9. RHEL DS Client Configuration
10. System Security Services Daemon (SSSD)

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11. User and Group Administration

9. PLUGGABLE AUTHENTICATION MODULES (PAM)

1. PAM Overview
2. PAM Module Types
3. PAM Order of Processing
4. PAM Control Statements
5. PAM Modules
6. pam_unix
7. pam_nologin.so
8. pam_limits.so
9. pam_wheel.so
10. pam_xauth.so

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11. Restricting superuser access to wheel group membership
12. Using pam_nologin to Restrict Logins
13. Setting Limits with the pam_limits Modules
14. Using pam_limits to Restrict Simultaneous Logins

10. SECURITY ADMINISTRATION

1. Security Concepts
2. Tightening Default Security
3. Fine Grained Authorizations with Polkit
4. File Access Control Lists
5. Manipulating FACLs
6. Viewing FACLs
7. Backing Up FACLs
8. File Creation Permissions with umask
9. User Private Group Scheme

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10. Alternatives to UPG
11. SELinux Security Framework
12. SELinux Modes
13. SELinux Commands
14. Choosing an SELinux Policy
15. SELinux Booleans
16. Permissive Domains
17. SELinux Policy Tools
18. FirewallD

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19. User Private Groups
20. Using Filesystem ACLs
21. Exploring SELinux Modes
22. SELinux File Contexts
23. SELinux Contexts in Action

11. BASIC NETWORKING

1. IPv4 Fundamentals
2. TCP/UDP Fundamentals
3. Linux Network Interfaces
4. Ethernet Hardware Tools
5. Network Configuration with ip Command
6. Configuring Routing Tables
7. IP to MAC Address Mapping with ARP
8. Starting and Stopping Interfaces
9. NetworkManager
10. DNS Clients
11. DHCP Clients
12. Network Diagnostics
13. Information from ss and netstat
14. Hardware and System Clock
15. Managing Network-Wide Time
16. Continual Time Sync with NTP
17. Configuring NTP Clients
18. Useful NTP Commands

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19. Network Discovery
20. Basic Client Networking
21. NTP Client Configuration

12. ADVANCED NETWORKING

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1. Multiple IP Addresses
2. Configuring a DHCP server
3. IPv6
4. Interface Aggregation
5. Interface Bonding
6. Network Teaming
7. Interface Bridging

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8. Multiple IP Addresses Per Network Interface
9. Configuring IPv6
10. Troubleshooting Practice: Networking

13. LOG FILE ADMINISTRATION

1. System Logging
2. systemd Journal
3. systemd Journal's journalctl
4. Secure Logging with Journal's Log Sealing
5. gnome-system-log
6. Rsyslog
7. /etc/rsyslog.conf
8. Log Management
9. Log Anomaly Detector
10. Sending logs from the shell

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11. Using the systemd Journal
12. Setting up a Full Debug Logfile
13. Remote Syslog Configuration
14. Remote Rsyslog TLS Configuration

14. MONITORING & TROUBLESHOOTING

1. System Status – Memory
2. System Status – I/O
3. System Status – CPU
4. Performance Trending with sar
5. Determining Service to Process Mapping
6. Real-time Monitoring of Resources — Cgroups
7. Troubleshooting Basics: The Process
8. Troubleshooting Basics: The Tools
9. strace and ltrace
10. Common Problems

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11. Troubleshooting Incorrect File Permissions
12. Inability to Boot
13. Typos in Configuration Files
14. Corrupt Filesystems
15. RHEL7 Rescue Environment

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16. System Activity Reporter
17. Cgroup for Processes

15. SECURING SERVICES

1. Xinetd
2. Xinetd Connection Limiting and Access Control
3. Xinetd: Resource limits, redirection, logging
4. TCP Wrappers
5. The /etc/hosts.allow & /etc/hosts.deny Files
6. /etc/hosts.{allow,deny} Shortcuts
7. Advanced TCP Wrappers
8. FirewallD
9. Netfilter: Stateful Packet Filter Firewall
10. Netfilter Concepts
11. Using the iptables Command
12. Netfilter Rule Syntax
13. Connection Tracking

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14. Securing xinetd Services
15. Securing Services with TCP Wrappers
16. Securing Services with Netfilter
17. FirewallD

16. DNS CONCEPTS

1. Naming Services
2. DNS – A Better Way
3. The Domain Name Space
4. Delegation and Zones

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5. Server Roles
6. Resolving Names
7. Resolving IP Addresses
8. Basic BIND Administration
9. Configuring the Resolver
10. Testing Resolution

17. CONFIGURING BIND

1. BIND Configuration Files
2. named.conf Syntax
3. named.conf Options Block
4. Creating a Site-Wide Cache
5. rndc Key Configuration
6. Zones In named.conf
7. Zone Database File Syntax
8. SOA – Start of Authority
9. A, AAAA, & PTR – Address & Pointer Records
10. NS – Name Server
11. TXT, CNAME, & MX – Text, Alias, & Mail Host
12. SRV – SRV Service Records

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13. Configuring BIND Zone Files

18. USING APACHE

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2. Apache Architecture
3. Dynamic Shared Objects
4. Adding Modules to Apache
5. Apache Configuration Files
6. httpd.conf – Server Settings
7. httpd.conf – Main Configuration
8. HTTP Virtual Servers
9. Virtual Hosting DNS Implications
10. httpd.conf – VirtualHost Configuration
11. Port and IP based Virtual Hosts
12. Name-based Virtual Host

13. Apache Logging
14. Log Analysis
15. The Webalizer

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16. Apache Architecture
17. Apache Content
18. Configuring Virtual Hosts

19. APACHE SECURITY

1. Virtual Hosting Security Implications
2. Delegating Administration
3. Directory Protection
4. Directory Protection with AllowOverride
5. Common Uses for .htaccess
6. Symmetric Encryption Algorithms
7. Asymmetric Encryption Algorithms
8. Digital Certificates
9. TLS Using mod_ssl.so

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10. Using .htaccess Files
11. Using TLS Certificates with Apache
12. Use SNI and TLS with Virtual Hosts

20. APACHE SERVER-SIDE SCRIPTING ADMINISTRATION

1. Dynamic HTTP Content
2. Installing PHP
3. Apache's Tomcat
4. Installing Java SDK
5. Installing Tomcat Manually
6. Using Tomcat with Apache

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7. CGI Scripts in Apache
8. Apache's Tomcat
9. Using Tomcat with Apache
10. Installing Applications with Apache and Tomcat

21. IMPLEMENTING AN FTP SERVER

1. The FTP Protocol

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2. Active Mode FTP
3. Passive Mode FTP
4. ProFTPD
5. Pure-FTPd
6. vsftpd
7. Configuring vsftpd
8. Anonymous FTP with vsftpd

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9. Configuring vsftpd

22. THE SQUID PROXY SERVER

1. Squid Overview
2. Squid File Layout
3. Squid Access Control Lists
4. Applying Squid ACLs
5. Tuning Squid & Configuring Cache Hierarchies
6. Bandwidth Metering
7. Monitoring Squid
8. Proxy Client Configuration

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9. Installing and Configuring Squid
10. Squid Cache Manager CGI
11. Proxy Auto Configuration
12. Configure a Squid Proxy Cluster

23. SQL FUNDAMENTALS AND MARIADB

1. Popular SQL Databases
2. SELECT Statements
3. INSERT Statements
4. UPDATE Statements
5. DELETE Statements
6. JOIN Clauses
7. MariaDB
8. MariaDB Installation and Security
9. MariaDB User Account Management
10. MariaDB Replication

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11. SQL with Sqlite3

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12. Installing and Securing MariaDB
13. Creating a Database in MariaDB
14. Create a Database Backed Application

24. LDAP CONCEPTS AND CLIENTS

1. LDAP: History and Uses
2. LDAP: Data Model Basics
3. LDAP: Protocol Basics
4. LDAP: Applications
5. LDAP: Search Filters
6. LDIF: LDAP Data Interchange Format
7. OpenLDAP Client Tools
8. Alternative LDAP Tools

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9. Querying LDAP

25. OPENLDAP SERVERS

1. Popular LDAP Server Implementations
2. OpenLDAP: Server Architecture
3. OpenLDAP: Backends
4. OpenLDAP: Replication
5. Managing slapd
6. OpenLDAP: Configuration Options
7. OpenLDAP: Configuration Sections
8. OpenLDAP: Global Parameters
9. OpenLDAP: Database Parameters
10. OpenLDAP Server Tools
11. Native LDAP Authentication and Migration
12. Enabling LDAP-based Login
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14. Building An OpenLDAP Server
15. Enabling TLS For An OpenLDAP Server
16. Enabling LDAP-based Logins

26. SAMBA CONCEPTS AND CONFIGURATION

1. Introducing Samba
2. NetBIOS and NetBEUI
3. Samba Daemons
4. Accessing Windows/Samba Shares from Linux

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5. Samba Utilities
6. Samba Configuration Files
7. The smb.conf File
8. Mapping Permissions and ACLs
9. Mapping Linux Concepts
10. Mapping Users
11. Sharing Home Directories
12. Sharing Printers
13. Share Authentication
14. Share-Level Access
15. User-Level Access
16. Samba Account Database
17. User Share Restrictions

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18. Samba Share-Level Access
19. Samba User-Level Access
20. Samba Group Shares
21. Handling Symbolic Links with Samba
22. Samba Home Directory Shares