

# Oracle Linux 8: System Administration I

Infrastructure

DURATION

**5 Days**

MODULES

**1 Lectures**

COURSE CODE

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## Course Overview

The course covers the following topics: Install and complete initial setup of Oracle Linux Configure the Unbreakable Enterprise Kernel for Oracle Linux Oracle Ksplice for updates without rebooting Configure users, storage, and network interfaces on Oracle Linux Preparation of the Oracle Linux server for the installation of Oracle Database Monitor and troubleshoot Oracle Linux

## What You Will Learn

### Course Introduction

- Course Objectives
- Course Schedule
- Objectives
- Virtualization with Oracle VM Server for x86
- Oracle VM Server for x86 in the Classroom
- Working with Classroom Virtual Machines
- Summary
- Practice 1: Overview

### Introduction to Oracle Linux

- Objectives
- Linux Kernel
- The GNU Project
- GNU General Public License (GPL)
- Linux Kernel Development Model
- Continuous Mainline Kernel Development
- Linux Distributions
- Oracle Linux
- Oracle's Technical Contributions to Linux
- Compatibility with Red Hat Enterprise Linux (RHEL)
- Oracle Linux Release/Update Targets

- The Unbreakable Enterprise Kernel (UEK)
- DTrace
- Btrfs File System
- Oracle Linux Release Notes
- Quiz
- Summary
- Practice 2: Overview

## Installing Oracle Linux 8

- Objectives
- Obtaining Oracle Linux
- Oracle Software Delivery Cloud
- Anaconda Installer
- Oracle Linux Installation Menu
- Boot Options
- Welcome to Oracle Linux
- Installation Summary
- Time and Date Configuration
- NTP Configuration
- Keyboard Layout
- Language Support
- Software Installation Source
- Selecting the Software to Install
- Installation Destination
- Automatic Partitioning
- Manual Partitioning
- Summary of Partitioning
- Network and Host Name Configuration
- Network Connection Settings
- Security Policy
- KDUMP
- Setting the root Password
- Creating an Initial User
- Perform the Installation
- Initial Setup
- GUI Login Window
- Quiz
- Summary

## OpenSSH

- Objectives
- OpenSSH: Introduction
- OpenSSH Configuration Files
- OpenSSH Configuration
- Using OpenSSH Utilities

- Using the ssh Command
- Using the scp Command
- Using the sftp Command
- Using the ssh-keygen Command
- Using ssh-agent
- Quiz
- Summary
- Practice 4: Overview

## The GRUB Bootloader

- Objectives
- Oracle Linux Boot Sequence
- Boot Mode: BIOS or UEFI
- BIOS Boot with the Master Boot Record (MBR)
- Globally Unique Identifier (GUID) Partition Table: GPT
- GPT Layout
- Disk Layout and File System Differences with UEFI
- The efibootmgr Utility
- Secure Boot with UEFI
- GRUB 2 Bootloader Configuration
- The /etc/default/grub File
- Kernel Boot Parameters
- Boot Loader Specification
- GRUB 2 Configuration File
- Boot Loader Entry
- GRUB 2 Menu
- Editing a GRUB 2 Menu Option
- GRUB 2 Command Line
- Setting the Default Kernel
- The Initial RAM File System
- Adding Kernel Modules to an initramfs File
- Quiz
- Summary
- Practice 5: Overview

## Introduction to systemd

- Objectives
- systemd Introduction
- systemd Units
- systemd Target Units
- System State Commands
- Working with the Default Target
- Rescue and Emergency Mode
- systemd Service Units
- Enabling and Disabling Services

- Starting, Stopping, and Restarting Services
- Checking the Status of a Service
- Displaying the Status of Services
- The Service Unit File
- The [Unit] Section
- The [Install] Section
- The [Service] Section
- The /etc/sysconfig Directory
- Overriding Service Unit Files
- systemd Socket Units
- Quiz
- Summary
- Practice 6: Overview

## Managing Time

- Objectives
- Configuring System Date and Time During Installation
- Configuring System Date and Time from the Command Line
- Using the timedatectl Utility
- Using Network Time Protocol
- Configuring NTP by Using Chrony
- Automating System Tasks
- The cron Command Scheduler
- Configuring cron Jobs
- The crontab Utility for User Tasks
- Using anacron for Less Frequent Tasks
- Configuring anacron Jobs
- Configuring systemd Timers
- Checking Timer Status
- Quiz
- Summary
- Practice 7: Overview

## Kernel and Device Configuration

- Objectives
- Loadable Kernel Modules (LKM)
- Loading and Unloading Kernel Modules
- Kernel Module Parameters
- The proc File System
- Accessing Files in the proc File System
- Top-Level Files in /proc
- Process Directories in /proc
- Other Directories in /proc
- The /proc/sys Directory
- The sysctl Utility

- The sysfs File System
- The lshw Utility
- Creating the /dev Directory
- udev Rule Files and Directories
- Sample udev Rules
- The udevadm Utility
- Creating a Symbolic Link to a Device Node
- Quiz
- Summary
- Practice 8: Overview

## Package Management

- Objectives
- Package Management: Introduction
- Using Query Options with the rpm Utility
- Using rpm to Install, Update, or Remove Packages
- Oracle Linux Yum Server
- The dnf Configuration
- Repository Configuration Files
- Available yum Repository Configurations
- Locating Packages with the dnf Utility
- Using dnf to Install, Upgrade, or Remove Packages
- dnf Groups
- Managing dnf repositories
- DNF Modules and Application Stream
- Displaying Available Modules
- Selecting a Module
- Enabling Modules
- Installing Modules
- Removing Installed Modules
- DNF Security Options
- DNF Automatic Tool
- Unbreakable Linux Network (ULN)
- ULN Channels
- Registering Your System with ULN
- Switching A RHEL 8 System from RHN to ULN
- Quiz
- Summary
- Practice 9: Overview

## Oracle Ksplice

- Objectives
- Oracle Ksplice: Introduction
- Ksplice Addresses System Administrator Challenges
- Ksplice: Features and Benefits

- Ksplice Patching
- Ksplice for Diagnosing Issues
- Ksplice Track Record
- Ksplice Case Study
- How Ksplice Works
- Online Ksplice Implementations
- Offline Ksplice Implementations
- Implementing the Ksplice Online Standard Client
- Subscribing to the Ksplice Channel
- Ksplice Packages on ULN
- Using Ksplice Uptrack
- Ksplice Uptrack Command Summary
- Ksplice Web Interface: System Status
- Ksplice Web Interface: System Status Detail
- The Ksplice Offline Standard Client
- Modifying a Local Yum Server to Act as a Ksplice Mirror
- Updating a Local Yum Server with Ksplice Channels
- Configuring Offline Standard Client to Use the Local Mirror
- The Ksplice Enhanced Client
- Implementing the Ksplice Online Enhanced Client
- Managing the Ksplice Enhanced Client
- Configuring Offline Enhanced Client to Use a Local Mirror
- Quiz
- Summary
- Practice 10: Overview

## User and Group Administration

- Objectives
- Introduction to Users and Groups
- User and Group Configuration Files
- Adding a User Account
- Modifying or Deleting User Accounts
- Group Account Administration
- User Private Groups
- Password Configuration
- The /etc/login.defs File
- Restricting Use of the su Command
- Allowing Use of the sudo Command
- User/Group Administration in the Enterprise
- Quiz
- Summary
- Practice 11: Overview

## Partitions, File Systems, and Swap

- Objectives

- Disk Partitions
- Partition Layout: Example Using MS-DOS Partitioning
- Viewing and Refreshing the Partition Tables
- Partition Table Manipulation Utilities
- The fdisk Utility
- Using the fdisk Utility
- The cfdisk Utility
- The parted Utility
- File System Types
- Making File Systems
- Mounting File Systems
- Maintaining File Systems
- Swap Space
- The /etc/fstab File
- Quiz
- Summary
- Practice 12: Overview

## Network Configuration

- Objectives
- NetworkManager
- Connection Profiles
- Connection Profile File Names
- Network Interface File Parameters
- Additional Network Configuration Files
- The ethtool Utility
- Running Custom Network Scripts
- The nmcli Utility
- The nmcli general Object
- The nmcli networking Object
- The nmcli radio Object
- The nmcli connection Object
- The nmcli connection show Command
- nmcli connection up|down Commands
- The nmcli connection add Command
- The nmcli connection edit Command
- The nmcli connection modify Command
- nmcli connection delete | reload | load Commands
- The nmcli device Object
- The nmtui Utility
- The ip Utility
- The ip addr Object
- The ip link Object
- Address Resolution Protocol (ARP)
- The ip route Object

- NetworkManager and the Routing Table
- Quiz
- Summary
- Practice 13: Overview

## Network Security

- Objectives
- Packet-Filtering Firewalls
- Introduction to firewalld
- Zones
- firewalld Zones
- Predefined firewalld Zones
- Setting the Default firewalld Zone
- firewalld Services
- The firewall-cmd Utility
- Starting firewalld
- Configuring firewalld
- Creating Advanced Firewall Configurations
- Ruleset, Tables, and Chains
- An Example
- Getting a Handle
- Making nftables Configuration Permanent
- Quiz
- Summary
- Practice 14: Overview

## Oracle on Oracle

- Objectives
- Oracle Preinstall RPM
- Oracle Software User Accounts
- Oracle Software Group Accounts
- Oracle Automatic Storage Management (ASM) Groups
- System Resource Tuning
- Linux Shared Memory
- Semaphores
- Network Tuning
- Setting the File Handles Parameter
- Asynchronous I/O (AIO)
- Oracle-Related Shell Limits
- HugePages
- Configuring HugePages
- Oracle ASM
- ASM Library Driver (ASMLib)
- Using ASMLib Commands
- ASM Filter Driver (ASMPFD)

- Quiz
- Summary
- Practice 15: Overview

## System Monitoring and Management

- Objectives
- sosreport Utility
- iostat Utility
- mpstat Utility
- vmstat Utility
- sar Utility
- top Utility
- iotop Utility
- strace Utility
- ss Utility
- tcpdump Utility
- Capturing Packets with the tcpdump Utility
- Wireshark
- tshark
- OSWatcher (OSWbb)
- Using the RPM Version of OSWatcher
- Using the MOS Version of OSWatcher
- OSWbb Diagnostic Data Output
- OSWatcher Analyzer (OSWbba)
- Analyzing OSWbb Archive Files
- Oracle Enterprise Manager Cloud Control
- Oracle Enterprise Manager Cloud Control Components
- Oracle Enterprise Manager Cloud Control GUI Sections
- Oracle EM Cloud Control: Enterprise Summary
- Oracle EM Cloud Control: Oracle Linux Home
- Oracle Linux Manager: Overview
- Oracle Linux Manager: Features and Functionality
- Oracle Linux Manager Web Interface: Overview Page
- Using Cockpit to Manage Oracle Linux
- Activating Cockpit
- Cockpit User Interface
- Quiz
- Summary
- Practice 16: Overview

## System Logging

- Objectives
- System Logging: Introduction
- rsyslog Configuration
- rsyslog Filter Options

- Facility/Priority Selectors
- rsyslog Actions
- rsyslog Templates
- Configuring Log Rotation (logrotate)
- The logwatch Utility
- The systemd-journald Journal File
- The journalctl Utility
- Journal Metadata
- Quiz
- Summary
- Practice 17: Overview

## Troubleshooting

- Objectives
- Two-Phased Approach to Troubleshooting
- Gathering Information
- Operating System Logs
- dmesg Utility
- Troubleshooting Resources
- My Oracle Support
- Causes of Common Problems
- Troubleshooting Boot Problems
- Quiz
- Summary
- Practice 18: Overview