Red Hat OpenStack Administration I: Core Operations for Domain Operators (CL110) Training

Duration: **5 Day**

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Learn to manage Red Hat OpenStack Platform private cloud environments, configure secure resources and deploy scalable cloud applications, networks and storage services.

Red Hat OpenStack Administration I: Core Operations for Domain Operators (CL110) provides the essential knowledge and practical skills required to operate and manage production **Red Hat OpenStack Platform (RHOSP)** private cloud environments.

The course focuses on managing a **single-site OpenStack overcloud**, creating secure project environments and provisioning the resources cloud users need to deploy applications. Participants learn how to manage **user permissions**, **network configurations**, **storage services** and **scalable application deployments** within an OpenStack infrastructure.

The training also introduces **OpenShift integration**, **load balancing**, **identity management**, **monitoring**, **proxy services** and **storage solutions**. Participants further develop their ability to troubleshoot cloud infrastructure issues and perform essential **Day 2 operational tasks**.

This course is based on **Red Hat OpenStack Platform 16.1**.

Course Content Summary

The **CL110 training programme** covers the routine and specialised operational tasks involved in managing a production OpenStack overcloud domain. Participants work with both the **web-based management interface** and **command-line tools (CLI)** to configure and administer cloud resources.

Key skills covered during the course include:

- Launching **virtual machine instances** for different application scenarios.
- Managing **domains, projects, users, roles and quotas** in multitenant cloud environments.
- Configuring and administering **networks, subnets, routers and floating IP addresses**.
- Securing instances through **security group rules and access keys**.
- Creating and managing **block storage, object storage and shared storage** resources.
- Customising instance deployment processes using **cloud-init**.
- Deploying **scalable cloud applications through stack templates**.

Impact on the Organisation

The **Red Hat OpenStack Administration I (CL110)** course develops the technical capabilities needed to operate and manage private cloud infrastructure effectively as part of daily business operations.

Private cloud environments can help organisations reduce costs through more precise resource

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control, simplify regulatory compliance and support integration with existing legacy systems.

Using the skills gained during this training, cloud users and operators can create and manage **project resources consisting of networks, services and template-based applications**. These flexible configurations can significantly reduce the need to deploy new physical infrastructure for individual projects.

The **Red Hat OpenStack Platform 16.1** release includes important improvements such as **service containerisation**, new installation and management tools, a redesigned application load balancing component and expanded functionality supported by the **OpenStack CLI**.

In addition, **PackStack** is among the installation tools that have been fully deprecated in this platform release.

The operational and business benefits of the training may vary depending on each organisation's infrastructure, technical requirements and implementation environment.

Recommended Next Courses

Participants who wish to continue developing their OpenStack administration and cloud storage expertise may consider the following courses:

- **Red Hat OpenStack Administration II: Day 2 Operations for Cloud Operators (CL210)**
- **Cloud Storage with Red Hat Ceph Storage (CL260)**

Prerequisites

Participants should meet one of the following requirements:

- Hold the **Red Hat Certified System Administrator (RHCSA)** certification.
- Demonstrate **system administration knowledge and experience equivalent to RHCSA level**.

Participants who do not hold the RHCSA certification may use the **Red Hat skills assessment** to evaluate their current knowledge.

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Who Should Attend

This training is intended for professionals responsible for deploying, operating or maintaining applications within **private and hybrid OpenStack cloud environments**.

The course is particularly relevant to:

- **Cloud users** who deploy application instances and application stacks.
- **Domain operators** responsible for managing cloud resources and security permissions.
- **Cloud operations personnel** who maintain applications running on private or hybrid OpenStack infrastructures.
- **Technology evaluation teams** seeking to understand Red Hat OpenStack Platform operations and application deployment methods.

What You Will Learn

By completing this course, participants will gain an understanding of**private and hybrid OpenStack cloud architectures** and develop the skills required to create, manage and troubleshoot**software-defined networks, cloud resources, servers and applications** in dynamically scalable business environments.

By the end of the training, learners will be able to:

- Design and implement **on-demand projects, software-defined networks and virtual machine instances**.
- Deploy an **OpenStack proof-of-concept (PoC) environment** for practice, development, demonstrations and testing within their own computing infrastructure.
- Manage OpenStack resources such as **subnets, routers, floating IP addresses, images, flavors, security groups and security rules**.
- Configure and administer **block storage and object storage** services.
- Create and customise **advanced virtual machine instances**, including deployment-time configuration.
- Build **scalable application stacks** consisting of multiple virtual machine applications.
- Perform essential **operational management and troubleshooting tasks** within an OpenStack environment.

Training Outline

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1. Introduction to Red Hat OpenStack Platform

Explore the **OpenStack architecture and its core components**, understand the different user and operator roles, and learn how to launch a virtual machine instance.

- **OpenStack personas and operational roles**
- **OpenStack components and architecture**
- **Launching virtual machine instances**

2. Manage Application Projects in a Multitenant Cloud

Create and configure **secure cloud projects** with appropriate user permissions and sufficient resources to support application deployment requirements.

- **Project creation and configuration**
- **User access and security permissions**
- **Project resource management**

3. Manage OpenStack Networking

Understand how IP networks are implemented within OpenStack, including**fundamental TCP/IP behaviour**, **software-defined networking (SDN)** components and the network types available to self-service cloud users.

- **OpenStack IP networking**
- **TCP/IP fundamentals**
- **Software-defined networking components**
- **Self-service network types**

4. Configure Resources to Launch a Non-Public Instance

Prepare and configure the resources needed to launch a virtual machine instance that operates within a tenant network without public access.

- **Virtual CPU (vCPU) and memory resources**
- **System disk images**
- **Launching instances within tenant networks**
- **Deploying application components without public access**

5. Configure Virtual Machine System Disks

Examine the available options for configuring, storing and selecting**block-based virtual machine**

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system disks according to application requirements.

- **Block-based VM system disks**
- **Ephemeral disks**
- **Persistent disks**
- **Selecting appropriate disk configurations for specific use cases**

6. Provide Additional Storage Strategies

Explore alternative storage methods available in OpenStack and identify suitable approaches for different cloud application requirements.

- **Object-based storage**
- **Network file sharing**
- **Storage volumes sourced from file sharing services**
- **Evaluating cloud storage options**

7. Configure Resources to Launch an Instance with Public Access

Identify and configure the additional networking and security resources required to deploy instances that need public connectivity.

- **Networking configuration for public access**
- **Access security components**
- **Launching publicly accessible instances**

8. Automate Customised Cloud Application Launches

Configure and deploy **multi-tier cloud application stacks** using architectural templates that define scalable virtual machine instances and their deployment customisations.

- **Multi-tier application stacks**
- **Template-based application deployment**
- **Instance launch customisation**
- **Scalable application configurations**

9. Manage Cloud Application Placement

Explore **advanced overcloud architectures** beyond a single-site environment and understand the resources used to control where virtual machine instances are deployed.

- **Advanced and multisite overcloud layouts**

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- **Cells and Availability Zones**
- **Instance placement controls**
- **Compute node resource requirements**
- **Managing placement attributes**

Note: The course outline may be updated to reflect technological developments and changing operational requirements.