

HPE Digital Learner OpenStack® Content Pack

HPE Content Pack number	CP001
Content Pack category	Category 1
Content Pack length	20 Hours
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Why HPE Education Services?

- IDC MarketScape leader 5 years running for IT education and training*
- Recognized by IDC for leading with global coverage, unmatched technical expertise, and targeted education consulting services*
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This 20-hour self-paced eLearning course offers a high-value, high-quality and interactive experience for students that is similar in scope and content to our traditional instructor-led training deliveries by our professional instructors. This course will provide baseline fundamentals and hands-on training across various operational roles, such as administrators, users and integrators that need to install, configure and manage the OpenStack® cloud services platform. This course includes enhanced on-demand capabilities, such as simulated labs, bookmarking and access to reference videos, blogs and other information to help students understand the critical operational elements required to stand up and operate a typical OpenStack® environment. Also covered are all relevant architectural overviews and an understanding of various OpenStack® projects and their functions. The hands-on, video demonstrations and simulations provide configuration and operation experience within major aspects of the OpenStack® environment. This course content and examples are based around the OpenStack® Pike release.

Audience

System Administrators, engineers and consultants who will plan and manage OpenStack®-based environments

Recommended learning

HPE recommends that students possess Linux and Cloud computing fundamentals knowledge prior to beginning this training.

Content Pack objectives

This course is presented in three modules:

Using OpenStack®

Use the OpenStack® software to quickly create and attach storage volumes to virtual machines. Learn how to create private networks for a multi-tier environment and launch a stack using the orchestration component of OpenStack®.

- Identify steps to deploy a server in OpenStack®
- Describe how to use OpenStack® to deploy a server that uses secure access
- List the steps to create a volume and attach it to a server
- Show the steps to create a bootable storage volume
- Describe how to create and access objects using the OpenStack® object storage service
- Show how to create networks and servers for a multitier environment
- Demonstrate how to deploy multiple servers using OpenStack® orchestration

Administering OpenStack®

This is for students who want to progress towards understanding how to administer an OpenStack® cloud. It covers the architecture and mechanisms that make it work.

- Describe the features of a cloud environment
- Identify the definition of OpenStack® and its function
- Identify primary types of cloud services
- Identify the projects that together make up OpenStack®
- Be able to set up projects, users, and security
- Monitor cloud health
- Differentiate between core OpenStack® projects, their architecture, and how to troubleshoot them

Installing DevStack

DevStack is a developers environment within which OpenStack® is installed. DevStack provides an ideal OpenStack® learning environment that can be installed on a single virtual machine. You will learn about general OpenStack® installation principals and then learn through demonstrations and a simulation how to install and configure DevStack.

- Identify considerations when planning an OpenStack® installation
- Describe various types of cloud deployments
- Describe how to deploy DevStack
- List configuration options you can apply to a DevStack environment

Detailed Content Pack outline

Module 1 : Using OpenStack®

Lesson 1: Introduction to OpenStack®	<ul style="list-style-type: none"> Welcome and objectives What is OpenStack® 	<ul style="list-style-type: none"> Tour of the OpenStack® dashboard Key takeaways
Lesson 2: Starting with OpenStack®	<ul style="list-style-type: none"> Working with images and instances Using the DevStack environment Touring the OpenStack® dashboard 	<ul style="list-style-type: none"> Signing in to OpenStack® Creating a server instance in OpenStack®
Lesson 3: Creating an instance with secure access	<ul style="list-style-type: none"> Understanding OpenStack® identity objects Securely accessing an instance Leveraging OpenStack® network resources 	<ul style="list-style-type: none"> Managing the instance lifecycle Taking a snapshot of an instance
Lesson 4: Adding a block storage volume to an instance	<ul style="list-style-type: none"> Understanding ephemeral and persistent storage Attaching and mounting a storage volume to an instance 	<ul style="list-style-type: none"> Creating a volume snapshot Creating a consistency group
Lesson 5: Creating a bootable storage volume	<ul style="list-style-type: none"> Defining ephemeral storage Defining persistent storage 	<ul style="list-style-type: none"> Launching a bootable volume Considerations for creating a bootable volume
Lesson 6: Working with storage objects	<ul style="list-style-type: none"> Summary of the object storage service 	<ul style="list-style-type: none"> Examining the project
Lesson 7: Creating a multitier environment	<ul style="list-style-type: none"> Creating a multitier environment 	<ul style="list-style-type: none"> OpenStack® network resources
Lesson 8: Creating a stack using orchestration	<ul style="list-style-type: none"> Overview of the orchestration service What you can do with orchestration 	<ul style="list-style-type: none"> How orchestration works

Module 2: Administering OpenStack®

Lesson 1: Introduction to OpenStack®	<ul style="list-style-type: none"> Cloud computing concepts Cloud services overview Features of OpenStack® Benefits of OpenStack® 	<ul style="list-style-type: none"> Evolution of OpenStack® Foundation and release history History in the open source community
Lesson 2: Exploring the OpenStack® architecture	<ul style="list-style-type: none"> Reviewing the high-level architecture Examining a typical deployment Overview of OpenStack® services & projects OpenStack® service interaction OpenStack® project pages Core projects in this training 	<ul style="list-style-type: none"> Communicating with OpenStack® projects Logical architecture REST API request format Constructing an URL for an API call Firefox RESTED plug-in Troubleshooting
Lesson 3: Managing OpenStack® health	<ul style="list-style-type: none"> Checking the status of OpenStack® services OpenStack® Telemetry service Telemetry service components Ceilometer data collection Transformation in the publishing pipeline Publishing the collected data 	<ul style="list-style-type: none"> Telemetry alarms Locating configuration files Ceilometer troubleshooting Ceilometer logging Telemetry logging in DevStack Verifying telemetry operations
Lesson 4: Managing projects, users, and security	<ul style="list-style-type: none"> Keystone identity and service management Keystone identity object relationships Keystone service components 	<ul style="list-style-type: none"> Keystone identity process OpenStack® federated identity services Keystone troubleshooting

Lesson 5: Exploring OpenStack® networking

- Neutron overview
- OpenStack® networking provided by Neutron
- Neutron service architecture
- Configuration example
- Neutron modular layer 2 plugin
- Virtual networking concepts
- Neutron network resources
- Network configuration example
- Troubleshooting Neutron
- Neutron log files
- Checking Neutron services C
- Neutron troubleshooting tips

Lesson 6: Managing images and flavors

- Glance overview
- Glance architecture
- Glance images
- Guest image introduction
- Container formats
- Create a Linux guest image
- Instance initialization with cloud-init
- Sources of metadata
- Common Glance management tasks
- Glance-related configuration files
- Managing images using the OpenStack® dashboard
- Common image-related CLI commands
- Troubleshooting the image service
- Troubleshooting overview
- Checking image information
- Checking VMDK headers

Lesson 7: Managing instances

- Nova overview
- Cloud computing fabric controller
- Nova system architecture
- Nova Cells v2
- Regions, availability zones, and host aggregates
- Nova scheduling
- Nova hypervisors
- VM instance creation begin and end states
- Nova scheduler overview
- Filter scheduler
- Common Nova management tasks
- Nova configuration files
- Managing Flavors
- Showing host usage statistics
- Gathering instance information
- Getting summary statistics
- Nova troubleshooting
- Verifying Nova installation
- Scenarios
- Nova service log files
- Tracing a request ID

Lesson 8: Managing the volume service

- Cinder overview
- OpenStack® block storage
- Block storage use cases
- OpenStack® storage overview
- Cinder architecture
- Cinder volume creation workflow
- Common Cinder management tasks
- Common management tasks
- Cinder snapshots and backups
- Creating a consistent snapshot
- Consistency groups
- Transferring Cinder volumes
- Cinder troubleshooting
- Troubleshooting Cinder
- Viewing the status of Cinder services

Lesson 9: Managing the object storage service

- Object storage service overview
- Logical organization
- Swift architecture
- Swift rings
- Swift ring partition
- Swift ring lookup
- Swift regions and zones
- Swift storage policies
- Swift consistency processes
- Common Swift management tasks
- Swift management operations
- Adding storage in a ring
- Swift CRUD operations
- Swift troubleshooting
- Diagnosing Swift issues
- Troubleshooting with Swift log files
- Hardware issues

Lesson 10: Managing the orchestration service	<ul style="list-style-type: none"> • Heat overview • Heat components • How Heat works 	<ul style="list-style-type: none"> • Heat Orchestration Template (HOT) • Heat template components Heat template components • Troubleshooting Heat
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Module 3: Installing and Configuring DevStack

Lesson 1: Understanding how OpenStack® is installed	<ul style="list-style-type: none"> • OpenStack® configuration options • Understanding cloud requirements • Primary OpenStack® installation methods 	<ul style="list-style-type: none"> • Installing OpenStack® manually • OpenStack® development environment (DevStack)
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Lesson 2: Installing DevStack	<ul style="list-style-type: none"> • Scripted DevStack installation process • Minimal local.conf file for devstack installation 	<ul style="list-style-type: none"> • Testing the installation
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Lesson 3: Configuring DevStack	<ul style="list-style-type: none"> • Restarting DevStack • Troubleshooting tools 	<ul style="list-style-type: none"> • Local.conf sections • local.conf with core projects
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