Hewlett Packard Enterprise

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*

- Key partnerships with industry leaders OpenStack®, VMware®, Linux®, Microsoft®, ITIL, PMI, CSA, and SUSE

- Complete continuum of training delivery options—self-paced eLearning, custom education consulting, traditional classroom, video on-demand instruction, live virtual instructor-led with hands-on lab, dedicated onsite training

- Simplified purchase option with HPE Training Credits

This 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 high value instructor-led training delivered by our professional instructors. This course will provide baseline fundamentals and hands-on training for administrators and users that need to configure and manage the OpenStack® cloud services platform. This course includes enhanced on-demand capabilities, such as demonstration videos, bookmarking and access to reference videos, blogs and other information to help students understand the critical operational elements required to manage 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 provide configuration and operation experience within major aspects of the OpenStack® environment. This course content and examples are based on the OpenStack® Rocky 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

- Identify the purpose and features of OpenStack

- Identify the OpenStack high-level architecture and list major components

- Identify methods of access to OpenStack services

- Gain basic hands on experience with OpenStack

- Identify HPE's involvement with the OpenStack platform

*Realize Technology Value with Training, IDC Infographic 2037, Sponsored by HPE, October 2017

Detailed Content Pack outline

Module 1: OpenStack Technology Overview	• This module introduces you to OpenStack - its origins and uses. This presents a short history of OpenStack and introduces you to the high-level architecture and terminology of OpenStack. OpenStack installation and use of the course lab environment are also covered.
Lesson 1: Cloud and OpenStack concepts	• This lesson covers the basic concepts and characteristics of cloud computing and OpenStack.
Lesson 2: OpenStack Architecture	• This lesson describes the high-level architecture of OpenStack to provide an understanding of the basic components of an OpenStack cloud and how the components work together.
Lesson 3: OpenStack Installation	• This lesson describes OpenStack installation including how to install your own DevStack cloud.
Lesson 4: Using the self-paced lab system	• This lesson describes the self-paced lab environment in which you will perform the labs available throughout the modules of this course.
Module 2: Accessing OpenStack	• This module provides instruction about the ways to access an OpenStack cloud, including the use of the command line interface, making API calls, and using the Horizon Dashboard.
Lesson 1: APIs, WSGI and Endpoints	• This lesson provides an overview of the OpenStack API as a foundation to understanding how users and services communicate in the cloud.
Lesson 2: OpenStack clients	• This lesson describes the different kinds of clients that can interact with an OpenStack cloud.
Module 3: Keystone (Identity)	• The authentication mechanisms built into OpenStack are covered, including Keystone concepts, users, projects, domains and role, and policies.
Lesson 1: Keystone concepts	• This lesson provides an overview of the OpenStack API as a foundation to understanding how users and services communicate in the cloud.
Lesson 2: Obtaining Keystone services	• This lesson describes the different kinds of clients that can interact with an OpenStack cloud.
Lesson 3: Authorization and policies	• This lesson describes the authentications and authorization processes.
Module 4: Nova (Servers)	• Nova is the compute management service within OpenStack. This module covers basic Nova concepts, Nova architecture, API access and versioning and scheduling. Finally you will walk through the organization of Nova compute nodes and troubleshooting.
Lesson 1: Nova concepts	• This lesson covers the core Nova features required to launch an instance
Lesson 2: Nova resources	• In this lesson, you learn that along with server instances, a number of other resources are managed by Nova. Additionally this lesson reviews how to work with the Nova resources.
Lesson 3: Nova API microversions	• This lesson describes microversioning as a method of periodically providing new features while maintaining backwards compatibility.
Lesson 4: Architecture and instance launch	• In this lesson, you explore the concept of launching instances from server images.
Lesson 5: Nova Scheduler and placement	• This lesson reviews the multiple compute nodes available to host server instances, and the OpenStack mechanism for scheduling and placing an instance on a host.
Lesson 6: Partitioning compute resources	• Compute hosts do not necessarily need to reside all in one data center. In this lesson, you will learn the various strategies that you can use to partition compute hosts across geographic regions.
Lesson 7: Services and logging	• This lesson provides an overview of how to verify the status of OpenStack services and view service log entries.

Module 5: Glance (Images)	• The Glance service maintains a catalog of cloud images for deployment to the OpenStack cloud. You will learn how images are managed by Glance and how an image store is configured. You will use the Glance commands and the Horizon dashboard to manage the cloud image catalog.
Lesson 1: Images and image stores	• OpenStack can manage and store server images using different services that are described in this lesson.
Lesson 2: Copying an image to Glance	• This lesson walks you through the process of filling an OpenStack catalog with server images.
Module 6: Neutron (Networks)	• Neutron is the networking service for OpenStack. You will learn about the network abstractions in Neutron as well as how Neutron networking works. Command examples and examples using the Horizon dashboard are demonstrated.
Lesson 1: Neutron resources	• This lesson introduces Neutron as the core networking component of OpenStack.
Lesson 2: Separating tenant networks	• Tenant networks must not overlap. This lesson describes how this is achieved in OpenStack.
Lesson 3: Plug-ins and agents	• This lesson covers the plug-in and agent mechanisms used by Neutron.
Lesson 4: Command examples	• This lesson reviews Neutron command line examples.
Module 7: Cinder (Block Storage – LUNs)	• Cinder is the volume storage management service in OpenStack. This module covers the basic concepts and architecture of Cinder, basic commands and several advanced concepts.
Lesson 1: Basic concepts	• This lesson reviews the basic concepts of the OpenStack block storage service.
Lesson 2: Basic commands	• This lesson shows how the OpenStack block storage service can be managed.
Lesson 3: Cinder implementation	• This lesson describes Cinder block storage service architecture and volume create and attach sequences.
Lesson 4: Advanced concepts	• This lesson covers the definition and configuration of volume back ends and volume types.
Lesson 5: Snapshots	• This lesson describes how to create and manage volume snapshots.
Lesson 6: Backups	• This lesson covers how volume backups are created and used.
Lesson 7: HPE Storage and Cinder	• This lesson provides an overview of the HPE storage integration with the OpenStack block storage service.

Module 8: Swift (Object Storage)	• Swift is the object storage service in OpenStack. This covers the basic concepts and architecture of Swift as well as usage for storing objects.
Lesson 1: Swift concepts	• This lesson provides an overview of object storage concepts.
Lesson 2: Using Swift	• This lesson describes using the Swift service to create and manage objects.
Lesson 3: Swift architecture	• This lesson describes the architectural components of Swift.
Module 9: Ceilometer (Metering) and Heat (Orchestration)	• This module reviews Telemetry services that generate, process and store measurement data about the OpenStack cloud infrastructure.
Lesson 1: Measuring the cloud	• This lesson covers measuring the operation and managing the performance of an OpenStack cloud.
Lesson 2: Alarms	• This lesson provides an overview of the architecture and use of alarms.
Lesson 3: Orchestrating a cloud application	• This lesson covers the basic use of the Heat orchestration engine.
Lesson 4: Alarms and autoscaling	• This lesson covers the use of alarms to trigger the autoscaling of a cluster in a Heat stack.
Lesson 5: Heat command examples	• This lesson covers how Heat stacks can be launched and managed from the command line.

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