



Introduction to OpenStack H6C68AAE

HPE course number	H6C68AAE
Course length	8 hours
Delivery mode	WBT
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This training focuses on the operation and architecture of the various OpenStack components, which are called Projects. It provides an introduction to the tools, processes, and resources developers will need to get started to work on OpenStack. This course has been updated for the Icehouse release of OpenStack.

This course offers flexible navigation and can be completed from start to finish or alternatively, only selected portions viewed according to individual needs.

Optional self-study lab exercises are included for those that choose to explore the material via hands-on activities.

Why HPE Education Services?

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- Simplified purchase option with HPE Training Credits

Audience

- This course is for developers new to OpenStack, including engineers who will develop code using OpenStack APIs and those who will submit code to OpenStack
- Architects, Solution Designers, Technical Consultants, and equivalent technical roles may also benefit from this course

System requirements

Minimum system requirements

- System font set to small or normal
- Microsoft Internet Explorer 7 or Mozilla Firefox 3, JavaScript enabled
- Adobe® Flash®, 10 or higher
- Adobe Acrobat® Reader, 10 or higher
- About 300MB of free disk space

Prerequisites

Students should have the following prerequisite knowledge: Required:

- Linux system management—must be comfortable with administration tasks and commands

Recommended:

- Linux networking—experience with networking on Linux server will be helpful
- Shell scripting experience is helpful
- qemu and KVM virtualization—helpful to understand the virtualization layer, but not required
- Storage concepts—basic understanding of how servers connect to storage

Course objectives

After completing this course, you should be able to:

- Describe the purpose and features of OpenStack
- List the major components of OpenStack

- Identify the interfaces for engaging OpenStack services
- Describe the OpenStack architecture
- Provide an overview of OpenStack code development and testing methods
- Identify the steps to submit code to an OpenStack project

Length

- Approximately 8 hours (Off line optional labs are an additional 8 hours)

Detailed course outline

Module 1: OpenStack Overview

OpenStack Overview

- Cloud service types
- What is OpenStack?
- OpenStack features
- OpenStack release history

HPE and the Cloud

- HPE OpenStack leadership
- HPE Helion
- HPE Helion OpenStack Community edition
- HPE Helion and OpenStack
- HPE Helion Public Cloud portfolio
- HPE CloudSystem

OpenStack Architecture

- OpenStack high-level architecture
- Icehouse release: conceptual architecture

Accessing OpenStack services

- OpenStack API interfaces
- Displaying service endpoint information
- OpenStack Horizon UI (dashboard)
- OpenStack CLI client
- Representational State Transfer (ReST) Client
- Firefox ReSTClient plug-in
- Firefox ReSTClient plug-in: demonstration
- Using cURL for OpenStack API requests
- Using Python to invoke the OpenStack API
- OpenStack Introduction learning check
- OpenStack Introduction optional lab exercises

Module 2: OpenStack Projects: Part 1

Keystone architecture

- Keystone functionality
- OpenStack user, tenant and role
- Keystone user and service management
- Keystone terminology
- Internal components of Keystone
- Example Keystone authentication/authorization process
- Keystone demonstration
- Keystone learning check
- Keystone optional lab exercises

Nova overview

- Nova functionality
- Nova supported hypervisors and bare metal
- Nova terminology
- Nova architecture
- Instance creation process: before/after
- Instance creation process
- Bare metal provisioning
- Bare metal driver terminology
- Tracing instance requests
- Nova demonstration
- Nova learning check
- Nova optional lab exercises

Glance overview

- Glance functionality
- Glance architecture
- Glance features
- Glance supported Image disk formats
- Glance supported container formats
- Glance-supported back-end stores
- Glance demonstration
- Glance learning check
- Glance optional lab exercises

Neutron overview

- Neutron overview
 - Nova networking functions versus Neutron
 - Neutron plug-ins
 - Neutron API
 - Fixed IPs and floating IPs
 - Role of a network manager
 - Neutron Architecture
 - Neutron components
 - Example configuration
 - Neutron deployment use cases
 - Compute host configuration
 - Neutron demonstration
 - Neutron learning check
 - Neutron optional lab exercises
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Module 3: OpenStack Projects—Part 2**Cinder overview**

- OpenStack storage overview
- OpenStack block storage
- Supported storage hardware
- Block storage tems
- High-level view of the Cinder Architecture
- Backups
- Snapshots
- Cinder demonstration
- Cinder learning check
- Cinder optional lab exercises

Swift overview

- Object Storage
- Object storage features
- User view: Accounts, containers, objects
- Swift architecture
- Swift learning check
- Swift optional lab exercises

Ceilometer overview

- Ceilometer overview
- Billing system processes
- Publishing workflow
- Data collection through notifications
- Data collection through polling agents
- Sample aggregation

- Metering pipeline
- Data storage
- Alarm features
- Ceilometer demonstration
- Ceilometer learning check
- Ceilometer optional lab exercises

Heat overview

- Heat functionality
- Heat terminology
- How a Heat template works
- HOT (Heat orchestration template) template
- Heat Orchestration Template components
- Example Heat template format
- Heat components
- Heat demonstration
- Heat learning check
- Heat optional lab exercises

Trove overview

- Trove overview
- Trove components
- Trove datastores
- Installing Trove
- Configuring Trove
- Trove learning check

Module 4: Developer Tools**Developer tools**

- Overview
- Liquid Prompt
- Syntastic
- Terminal emulators
- IDEs and debuggers
- Resource mall
- Developer tools optional lab exercises

Running code tests

- OpenStack coding conventions
- Testing in OpenStack
- Unit tests in OpenStack
- Where are the OpenStack unit tests?
- Test cases
- How tests generate results
- How run_tests.sh runs
- Running DevStack unit tests
- Running tests before submitting code
- Tempest configuration

- Stress testing
- Tempest resources
- Getting pre-requisite software
- Running code tests learning check
- Running code tests optional lab exercises

Setting up the development environment

- Steps to getting started
- Launchpad
- Joining OpenStack: The CLA
- OpenStack project websites
- Setting up the environment learning check
- Setting up the environment optional lab exercises

Contributing OpenStack code

- Levels of contribution
- OpenStack release cycle
- OpenStack branch model
- Contributing code learning check
- Contributing code optional lab exercises

OpenStack code review process

- Git, Gerrit and Jenkins
 - Setting the development environment proxy
 - Installing Git
 - Git review installation
 - Git workflow
 - Git workflow: creating topic branch
- Gerrit
 - Gerrit workflow
 - Gerrit architecture
 - Gerrit review examples
 - Code review process learning check
 - Code review optional lab exercises
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