Fundamentals of OpenStack Technology

Cursusduur: 3 Dagen   Cursuscode: H6C68S   Trainingsmethode: Maatwerk

Beschrijving:

This course teaches administrators and users to configure, manage and use the OpenStack® cloud services platform. An architectural overview ensures understanding of various OpenStack projects and their functions. Hands-on labs provide configuration and operations experience with major aspects of the OpenStack environment. Course content and labs are based on the OpenStack Ussuri release.

Doelgroep:

System administrators, engineers and consultants who plan and manage OpenStack-based environments

Doelstelling:

- After completing this course, students should to be able to:
- Describe the purpose and features of OpenStack
- Describe its high level architecture and list its major components
- Describe methods of access to OpenStack services

- Manage identities in an OpenStack cloud
- Launch and manage instances
- Create and manage images, volumes, networks and store objects
- Create, launch and monitor simple autoscaling stacks

Vereiste kennis en vaardigheden:

HPE recommends that students attain the following credentials or levels of experience before taking this course:

- Completion of HPE Linux Fundamentals (HJ7M0S)
- Completion of Linux for Unix Administrators (GL615) (U2794S)

Examens en certificering

- Certified OpenStack Administrator (COA)
- EXIN Foundation Certificate in OpenStack Software
Additional study and preparation may be required to pass the exams.

Cursusinhoud:

Module 1: OpenStack Technology Overview

- What is a cloud; what is OpenStack
- OpenStack architecture
- Your lab system

Module 2: Accessing OpenStack

- OpenStack API, endpoints and WSGI
- Authentication and tokens
- The OpenStack command line and dashboard

Module 3: Keystone (Identity)

- Keystone concepts
- Keystone API versions
- Keystone command line
- Authentication, authorization and policies

Module 4: Nova (Servers)

- Nova concepts
- How a user sees Nova instances
- Instances, keypairs, console, IP addresses, security groups, instance-specific data
- Launch instances and make them available on the network
- Customize an instance with user data
- Nova implementation
- Nova microversions
- Nova architecture
- What happens when an instance is launched
- Nova scheduler and placement service
- Managing compute nodes: regions, cells, aggregates, availability zones
- Nova troubleshooting

Module 5: Glance (Images)

- Glance concepts
- Where to get images
- Disk and container formats
- Uploading images
- Where images are stored

Module 6: Neutron (Networks)

- Neutron resource abstractions
- Networks, subnets, ports, routers
- Provider networks, external networks, tenant networks
- Floating IPs and address translation
- Network implementation
- Network separation and access
- Routing
- Plugins and agents
- The ML2 plugin
- Command examples

Module 7: Cinder (Block Storage – LUNs)

Module 8: Swift (Object Storage)

- Swift concepts
- Why object storage
- Accounts, containers, objects, replication
- Using Swift
- Uploading and downloading objects
- Access control with ACLs
- TempURL
- Large objects
- Swift architecture

Module 9: Ceilometer (Metering) and Heat (Orchestration)

- Ceilometer and the telemetry family
- Telemetry architecture and dataflow
- Ceilometer sampling and publishing to Gnocchi
- Alarms
- Heat: orchestrating a cloud application
- Heat architecture, templates and stacks
- Example template
- Heat and autoscaling
- Launching and viewing a stack

Detailed lab outline

Lab 1: OpenStack Overview

- Lab 1a: Accessing and setting up your lab environment
- Lab 1b: Obtaining OpenStack documentation

Lab 2: Accessing OpenStack

- Lab 2a: The dashboard
- Lab 2b: Discovery
- Lab 2c: The command line
- Task 1: Command line completion
- Task 2: A few CLI commands
- Lab 2d: The OpenStack shell

Lab 3: Keystone

- Lab 3a: Keystone configuration
- Lab 3b: Keystone access using the command line
- Task 1: Explore Keystone endpoints and API versions
- Task 2: List identity resources and explore their details
- Task 3: Create domains and projects
- Task 4: Explore roles and associated privilege
- Task 5: Use the GUI's RC file to set your identity
- Task 6: Explore the system scope
- Lab 3c: Using Horizon for identity administration

Lab 5: Glance

- Lab 5a: Discover your Glance implementation
- Lab 5b: Use Glance
- Task 1: Create a Glance image in Horizon
- Task 2: The Glance command line—classic image upload and other tasks

Lab 6: Neutron

- Lab 6a: Discover Neutron configuration settings
- Task 1: Explore configuration files
- Task 2: Explore the running system
- Lab 6b: Explore your networks
- Task 1: Explore your networks using the GUI
- Task 2: Explore your networks from the command line
- Task 3: Delete unneeded networks
- Lab 6c: Create a network and connect VMs
- Task 1: Use the CLI to create a new network and router
- Task 2: Find out why the router was not connected to the private network
- Task 3: Solve this problem with the CLI
- Task 4: Launch the second-tier instance
- Task 5: Launch the first-tier instance
- Task 6: Create a route between the instances
- Lab 6d (optional): Role-based access control
- Task 1: Share a network
- Task 2: Share a security group

Lab 7: Volume Management (Cinder)

- Lab 7a: Cinder configuration discovery
- Lab 7b: Create and attach volumes
- Task 1: Create a multi-attach volume
- Task 2: Explore how the volume is implemented
- Task 3: Attach the volume
- Task 4: Explore how volume attachment is implemented
- Task 5: Access the volume from the instances
- Task 6: Move the multi-attach volume to a third instance
- Task 7 (optional): Automatic volume deletion
- Task 8 (optional): Volume attachment tags
- Lab 7c: Launching an instance from a volume
- Task 1: Launch the instance
- Task 2 (optional): Compare an instance with ephemeral storage
- Lab 7d: Snapshots and backups
- Task 1: Recover file from snapshot
- Task 2: Backups
- Lab 7e (optional): Add a Cinder backend

- Basic concepts and commands
- OpenStack storage overview
- What cloud operators and users want from storage
- Storage drivers
- Creating, deleting, attaching, detaching, listing volumes
- Using volumes as boot disks
- Multi-attach
- Cinder implementation
- Advanced concepts
- Backends, volume types and extra specs
- Snapshots
- Backups
- HPE storage and Cinder

Lab 4: Nova

- Lab 4a: Discover the Nova implementation
- Task 1: Configuration files
- Task 2: Nova processes and services
- Lab 4b: Create an instance using the GUI
- Task 1: Enter essential instance details
- Task 2: Check networks and add a keypair
- Lab 4c: Create an instance from the command line
- Task 1: Verify Nova services
- Task 2: Gather necessary information
- Task 3: Create a key pair
- Task 4: Launch the instance
- Lab 4d: Access instances through their consoles
- Task 1: View instance console content
- Task 2: Use two methods to open interactive instance consoles
- Task 3: Confirm that the two instances have network connectivity to each other
- Lab 4e: Enable instance access from the network
- Task 1: Add floating IP addresses to the instances
- Task 2: Explore the default security group
- Task 3: From the GUI, create a security group that permits ICMP traffic
- Task 4: From the command line, add an SSH rule to the security group
- Task 5: Test ssh access
- Lab 4f: Instance metadata
- Task 1: Simple metadata
- Task 2: Use cloud-init to personalize an instance
- Lab 4g: Other instance actions
- Task 1: Create a snapshot
- Task 2 (optional): Pause an instance
- Task 3 (optional): Suspend an instance
- Lab 4h (optional): Create an instance that can't be scheduled
- Task 1: Look into a failed instance launch
- Task 2: Explore the placement service

- Task 1: Explore the current configuration
- Task 2: Add a volume backend
- Task 3: Create a volume type for the new backend and make it the default
- Task 4: Use the new volume type
- Lab 7f (optional): Specify volume type when root filesystem is a volume

Lab 8: OpenStack Object Storage (Swift)

- Lab 8a: Using the OpenStack Object Storage service GUI
- Task 1: Where does Glance keep its images?
- Task 2: Manage objects using the GUI
- Lab 8b: Command line
- Lab 8c (optional): Object versioning
- Lab 8d (optional): TempURL
- Lab 8e (optional): Large objects

Lab 9: OpenStack Metering (Ceilometer) and Orchestration (Heat)

- Lab 9a: Ceilometer alarms
- Task 1: Ceilometer and Gnocchi configuration
- Task 2: Generate and measure load
- Task 3: Set up and process alarms
- Task 4: Measuring groups of servers
- Task 5: Alarms on a group of instances
- Lab 9b: Orchestrating stacks
- Task 1: Create a simple stack
- Task 2: Create a stack with an autoscaling group
- Task 3: Create an autoscaling stack
- Task 4: Add parameters and output to the template
- Task 5: Explore autoscaling
- Task 6: Explore the orchestration section of Horizon

Nadere informatie:

Neem voor nadere informatie of boekingen contact op met onze Customer Service Desk 030 - 60 89 444

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