Centre for Development of Advanced Computing (C-DAC), Chennai

(A Scientific Society under Ministry of Electronics and Information Technology, Government of India.)

OpenStack Certification from The OpenStack Foundation authorized Training partner, Consultant and Integrator

Ref : https://www.openstack.org/marketplace/training/centre-for-development-of-advanced-computing%20/256

Course Name	**Certified OpenStack Administrator**	**OpenStack Integrator**	**OpenStack Solution Architect**
Program Overview	Provides expertise on • Deployment • Operation and management of OpenStack cloud	Provides expertise on • Deployment • Operation and management of OpenStack cloud • Enhancement and customization of cloud	Provides expertise on • Deployment • Operation and Management • Customization of OpenStack cloud • Components around Cloud ecosystem
Course Description	Refer Annexure A	Refer Annexure B	Refer Annexure C
Course Level	***Beginner***	***Intermediate***	***Advanced***
Training Location	Centre for Development of Advanced Computing (C-DAC), Tidel Park, 8th Floor, 'D' Block (North & South), No.4 Rajiv Gandhi Salai, Taramani, Chennai-600113, India. Phone: +91-44-22542226. Mail : cloud-chn@cdac.in		
	Client location (based on client requirements with mutually agreed terms and conditions)		
Course duration in Days / Hours	20 Hours (6 hours theory + 14 hours lab)	32 Hours (10 hours theory + 22 hours lab)	66 Hours (22 hours theory + 44 hours lab)
Mode of training	Online / Classroom	Online / Classroom	Online / Classroom
Proposed course charges / Participant	Contact : cloud-chn@cdac.in		

- The charges mentioned are course fees only. Certification and examination charges are additional.

C-DAC collaboration with The OpenStack Foundation

- C-DAC - the only Indian entity listed as official partner for Training and Consultation/ Integration for Asia-Pacific Region.
- C-DAC Chennai offers Cloud consulting, Operation and support, Cloud strategy services and development of OpenStack, System Integration / Deployment with Meghdoot Cloud suite, as the foundation authorized consultant and integrator.

Annexure – A

CERTIFIED OPENSTACK ADMINISTRATOR

Course description

The course intends to provide the participants expertise on operation and management of OpenStack Cloud environment (based on Certified OpenStack Administrator certification program).

Course duration

The duration of the program is 20 Hours (6 hours lecture + 14 hours Hands-on laboratory) + 3 hours (1 hour theory and 2 hours laboratory) mock examination.

Prerequisites

The participants should posses

- Basics of data centre environment – Servers and storage
- Working Knowledge of Linux
- Concepts of Computer networks

Course Syllabus

- **Lecture Sessions**
  - Introduction to Cloud and Fundamentals to Cloud
    - Introduction to Cloud, types, services, Architecture, Data Centre Fundamentals - Servers, Storage, Network, OS concepts.
  - Virtualization
    - Virtualization techniques, Types, Hypervisors
  - Overview of OpenStack
    - Architecture of OpenStack, project, services, mode of deployment, workflow.
  - Cloud Storage
    - Object storage and Block storage
  - Cloud Network
    - SDN with OpenStack, Architecture, Protocols, NFV
  - Cloud Management
    - Monitoring, Management, Maintenance, Troubleshooting, Backup, Recovery, SLA
  - Cloud Security
    - OpenStack security - RBAC, Identity service, Application security, data security
  - Containers and Edge Computing
    - Containers and Edge Computing with OpenStack
  - Cloud enablement and deployment of applications
    - HA Awareness, P2V conversion, migration, portability
  - Cloud considerations and advancements
    - Standards, Interoperability and Portability, DevOps, Orchestration, Regulatory Compliance

- **Laboratory experiments**
  - Deployment of virtualization environment
    - Installation, configuration and working on KVM
  - Deployment of Cloud
    - Installation and configuration of OpenStack
  - OpenStack APIs
    - Usage of OpenStack Horizon Dashboard, OpenStack CLI client
  - Identity management
    - Manage and create domains, projects, users, and roles, understand the differences between the member and admin roles, create roles for the environment, create and manage policy files and user access rules, create and manage RC files to authenticate with Keystone for command line use.
  - Compute
    - Create and manage flavors, create and manage compute instances, generate and manage SSH keys for use when connecting to instances, access an instance using an SSH key, configure an instance with a floating IP address, create instances with security groups, manage Nova host consoles, manage instance snapshots, manage instance quotas
  - Storage (Object and Block)
    - Use the command line client to upload and manage files to Swift containers, manage permissions on a container in object storage, create and manage volumes, attach volumes to instances, create new Block Storage volume and mount it to a Nova instance, manage volume quotas, backup and restore volumes, manage volume snapshots.
  - Networking
    - Manage network resources, create external/public networks, create project networks, create project routers, attach routers to public and project networks, manage network services for a virtual environment, manage network quotas, manage network interfaces on compute instances, create and manage project security groups and rules, assign security group to instance, create and manage floating IP addresses, assign floating IP address to instance, detach floating IP address from instance
  - Image management
    - Upload a new image to an OpenStack image repository, manage images, image metadata, image types, Bundling, exporting, migration and porting of images
  - Cloud Management
    - Installation and configuration of monitoring tools
  - Operation & Maintenance
    - Troubleshooting, log analysis
  - Containers
    - Deployment of Docker
  - Cloud enablement of applications and deployment
    - Deployment of sample applications

Learning outcome

- At the end of the program, the participants will be able to administer, manage, maintain, operate and support an OpenStack based cloud environment as *cloud administrator*.

Note

- Participation certificate will be provided by C-DAC for participants will full attendance.
- The certification fee for COA is to be paid by the candidate to OpenStack foundation fulfilling the terms and conditions of OpenStack foundation.
- For certification and examination, refer : https://www.OpenStack.org/coa/

Annexure – B

OPENSTACK INTEGRATOR

Course description

The course intends to provide the participants expertise on establishing a cloud environment by installation, configuration, operation and management of OpenStack.

Course structure

The duration of the program is 32 Hours (11 hours lecture + 21 hours Hands-on laboratory) + 6 hours (2 hours theory and 4 hours laboratory) mock examination.

Prerequisites

The participants should posses

- Basics of data centre environment – Servers and storage
- Working Knowledge of Linux
- Concepts of Computer networks

Course Syllabus

Lecture Sessions

- Introduction to Cloud and Fundamentals to Cloud
  - Introduction to Cloud, types, services, Architecture, Data Centre Fundamentals - Servers, Storage, Network, OS concepts.
- Virtualization
  - Virtualization techniques, Types, Hypervisors
- Overview of OpenStack
  - Architecture of OpenStack, project, services, mode of deployment, workflow.
- Cloud Storage
  - Object storage and Block storage
- Cloud Network
  - SDN with OpenStack, Architecture, Protocols, NFV
- Cloud Management
  - Monitoring, Management, Maintenance, Troubleshooting, Backup, Recovery, SLA
- Cloud Security
  - OpenStack security - RBAC, Identity service, Application security, data security
- Containers and Edge Computing
  - Containers and Edge Computing with OpenStack
- Cloud considerations
  - Standards, Interoperability and Portability, Regulatory Compliance
- Cloud orchestration
  - Configuration of high availability for controllers, replication
- Automation services

    - Application and Infra automation, DevOps
  - 3 Tier Deployment
    - DC, NLDC, DR
  - Cloud enablement of applications
    - HA awareness, P2V conversion
  - Application deployment in Cloud
    - Migration and portability of application workload into cloud

- **Laboratory experiments**
  - Deployment of virtualization environment
    - Installation, configuration and working on KVM
  - Deployment of Cloud
    - Installation and configuration of OpenStack
  - OpenStack APIs
    - Usage of OpenStack Horizon Dashboard, OpenStack CLI client
  - Compute
    - Create and manage flavors, create and manage compute instances, generate and manage SSH keys for use when connecting to instances, access an instance using an SSH key, configure an instance with a floating IP address, create instances with security groups, manage Nova host consoles, manage instance snapshots, manage instance quotas
  - Identity management
    - Manage and create domains, projects, users, and roles, understand the differences between the member and admin roles, create roles for the environment, create and manage policy files and user access rules, create and manage RC files to authenticate with Keystone for command line use.
  - Storage (Object and Block)
    - Use the command line client to upload and manage files to Swift containers, manage permissions on a container in object storage, create and manage volumes, attach volumes to instances, create new Block Storage volume and mount it to a Nova instance, manage volume quotas, backup and restore volumes, manage volume snapshots.
  - Networking
    - Manage network resources, create external/public networks, create project networks, create project routers, attach routers to public and project networks, manage network services for a virtual environment, manage network quotas, manage network interfaces on compute instances, create and manage project security groups and rules, assign security group to instance, create and manage floating IP addresses, assign floating IP address to instance, detach floating IP address from instance
  - Image management
    - Upload a new image to an OpenStack image repository, manage images, image metadata, image types, Bundling, exporting, migration and porting of images
  - Cloud Management
    - Installation and configuration of monitoring tools and backup, HA
  - Containers and Edge

- Deployment of Docker and edge tools
- SDN
  - Installation and configuration of Mininet / OpenVswitch
- Cloud Security
  - Installation and configuration of security tools
- Operation & Maintenance
  - Troubleshooting, log analysis
- Cloud enablement of applications
  - Cloud enabling sample applications
- Application deployment in Cloud
  - Migration and portability of application workload into cloud

Learning outcome

- At the end of the program, the participants will be able to establish cloud with installation and configuration, administer, manage, maintain, operate and support an OpenStack based cloud environment as *cloud integrator.*

Note:

- Participation certificate will be provided by C-DAC for participants will full attendance.
- The certification fee for is to be paid by the candidate to CDAC fulfilling the terms and conditions for certification.
- Contact the course coordinator (Mail : cloud-chn@cdac.in) for details on examination and certification.

Annexure - C

OPENSTACK SOLUTION ARCHITECT

Course description

The course intends to provide the participants expertise on establishing a cloud environment by installation, configuration, operation and management of OpenStack, software defined networking, containers.

Course structure

The duration of the program is 66 Hours (22 hours lecture + 44 hours Hands-on laboratory) + 16 hours (4 hours theory and 12 hours laboratory) mock examination.

Prerequisites

The participants should posses

- Basics of data centre environment – Servers and storage
- Working Knowledge of Linux
- Concepts of Computer networks

Course Syllabus

Lecture Sessions

- Introduction to Cloud and Fundamentals to Cloud
  - Introduction to Cloud, types, services, Architecture, Data Centre Fundamentals - Servers, Storage, Network, OS concepts.
- Virtualization
  - Virtualization techniques, Types, Hypervisors
- Overview of OpenStack
  - Architecture of OpenStack, project, services, mode of deployment, workflow.
- Cloud Storage
  - Object storage and Block storage
- Cloud Network
  - SDN with OpenStack, Architecture, Protocols, NFV
- Cloud Management
  - Monitoring, Management, Maintenance, Troubleshooting, Backup, Recovery, SLA
- Cloud Security
  - OpenStack security - RBAC, Identity service, Application security, data security
- Containers and Edge Computing
  - Containers and Edge Computing with OpenStack
- Cloud considerations
  - Standards, Interoperability and Portability, Regulatory Compliance
- Cloud orchestration
  - Configuration of high availability for controllers, replication

- Automation services
  - Application and Infra automation, DevOps
- 3 Tier Deployment
  - DC, NLDC, DR
- Cloud enablement of applications
  - HA awareness, P2V conversion
- Application deployment in Cloud
  - Migration and portability of application workload into cloud
- Cloud testing
  - Testing of Cloud workload and infrastructure
- Cloud design
  - DC, NLDC, DR architecture
- Applicability of Cloud
  - BDA, IoT, AI, ML

- **Laboratory experiments**
  - Deployment of virtualization environment
    - Installation, configuration and working on KVM
  - Deployment of Cloud
    - Installation and configuration of OpenStack
  - OpenStack APIs
    - Usage of OpenStack Horizon Dashboard, OpenStack CLI client
  - Compute
    - Create and manage flavors, create and manage compute instances, generate and manage SSH keys for use when connecting to instances, access an instance using an SSH key, configure an instance with a floating IP address, create instances with security groups, manage Nova host consoles, manage instance snapshots, manage instance quotas
  - Identity management
    - Manage and create domains, projects, users, and roles, understand the differences between the member and admin roles, create roles for the environment, create and manage policy files and user access rules, create and manage RC files to authenticate with Keystone for command line use.
  - Storage (Object and Block)
    - Use the command line client to upload and manage files to Swift containers, manage permissions on a container in object storage, create and manage volumes, attach volumes to instances, create new Block Storage volume and mount it to a Nova instance, manage volume quotas, backup and restore volumes, manage volume snapshots.
  - Networking
    - Manage network resources, create external/public networks, create project networks, create project routers, attach routers to public and project networks, manage network services for a virtual environment, manage network quotas, manage network interfaces on compute instances, create and manage project security groups and rules, assign security group to instance, create and manage

floating IP addresses, assign floating IP address to instance, detach floating IP address from instance

- Image management
  - Upload a new image to an OpenStack image repository, manage images, image metadata, image types, Bundling, exporting, migration and porting of images
- Cloud Management
  - Installation and configuration of monitoring tools and backup, HA
- Containers and Edge
  - Deployment of Docker and edge tools
- SDN
  - Installation and configuration of Mininet / OpenVswitch
- Cloud Security
  - Installation and configuration of security tools
- Operation & Maintenance
  - Troubleshooting, log analysis
- Cloud enablement of applications
  - Cloud enabling sample applications
- Application deployment in Cloud
  - Migration and portability of application workload into cloud
- Cloud testing
  - Testing of Cloud workload and infrastructure
- Cloud design
  - DC, NLDC, DR architecture
- Infra Automation
  - Ansible

Learning outcome

- At the end of the program, the participants will be able to design the cloud as *cloud architect*, establish cloud with installation and configuration, administer, manage, maintain, operate and support an OpenStack based cloud environment.

Note:

- Participation certificate will be provided by C-DAC for participants will full attendance.
- The certification fee for is to be paid by the candidate to CDAC fulfilling the terms and conditions for certification.
- Contact the course coordinator (Mail : cloud-chn@cdac.in) for details on examination and certification.