Software Defined Networking (SDN) and Network Function Virtualization (Coming Soon)

Modality: On Demand

Duration:

About this course:

The course has been specifically designed to deliver concise information of SDN (Software Defined Network) structure. The course touches upon the essential protocols that are connected to SDN deployments. It is a self-paced course so you will be able to get the training at your own ease, whenever you want. The SDN provides you with the opportunity to regulate and alongside have control of network function virtualization. In addition to this, you get to control the physical network elements. In this way, the professionals are able to appropriately incorporate and regulate concise unification of elements between the physical network and the cloud atmosphere.

Apart from this, the candidates taking this course will get to know about cloud boundaries and its working. The candidates will also get to learn about the procedure of studying a virtual network within the cloud. By enabling SDN, there is a rapid change in the networking control layer. This course will teach about how this is a fabulous thing and how much powerful this feature can be.

Learning Outcomes:

The course has the following learning outcomes:

- Setting up and incorporating the most famous network functions, bridging, routing, and OpenFlow switches.
- OpenStack neutron
- Requisite protocols
- Carrying out verification testing
- Incorporating the features in a reproduced physical environment
- Neutron computing

Job roles:

This course is very much beneficial. The holders of Cisco SDN certification hold a profitable job position like that of Software Engineer. On average, a software engineer earns $150,000 per annum.

Audience:

 This course is designed in such a manner that it can be taken by number of different professionals like system engineers, network engineers, architects as well as data center architects.

Requirements:

No prior requirements

Course Outline:

Module 1: Software-Defined Networking Introduction

- Data Plane
- Control Plane
- Problems with the current distributed Control Plane design
- Problems solved by the Centralized Control Plane
- Management Plane Functions
- Management protocols and applications
- Northbound vs Southbound Interfaces
- NETCONF
- RFC 7149 SDN: A Perspective from within a Service Provider Environment
- RFC 7426 SDN Layers and Architecture Terminology

Module 2: Overlays and Underlays

- Architecture for Overlay Networks (draft-ietf-nvo3-arch-04)
- Security Requirements of NVO3 (draft-ietf-nvo3-security-requirements-06)

Module 3: Open vs. Switch

- Architecture and Components
- ovsdb-server
- Core Tables
- Linux Bridge vs. OpenvSwitch Design
- OpenvSwitch Daemon
- Ovs-ofctl, ovs-dpctl
- OVS Kernel Module
- Tunnels: FRE, VXLAN, LISP
- OpenFlow Interface
- Hidden Flows
- Tracing Flow
- Intel DPDK Effect

Module 4: Simulation and Observation

- 100% hands on labs this section

Module 5: OpenFlow

- OpenFlow Components
- Controller Overview
- OpenFlow Switches

- Basic Operations and Messages
- Controller Northbound Interfaces
- Review of OpenFlow Specification (current or 1.1.0, Wire protocol 0x02)
- Flow Tables, Pipeline processing
- Group Table, Matching, Instructors
- Encryption, Connection, Message Handling
- How to Verify the Configurations?
- Troubleshooting Steps Using OpenFlow
- Performance
- Debugging Tools
- Segment Routing

Module 6: Network Function Virtualization

- NFV Terminology
- NFV Architecture
- Relationship with SDN
- ETSI NFV Industry Specification Group Models
- Service Function Chaining Architecture (RFC 7665)
- NFV Reference Points
- Example Network Virtualization Functions Use Cases

Module 7: Securing SDN

- Securing the Controller
- Protecting the Controller
- Trust Establishment
- Robust Policy Framework
- Conducting Forensics
- Remediation Techniques and Implementation

Module 8: NFV Practical Application

- NFV Networking Requirements
- How to Specify Hardware that Supports NFV
- Differences between NFV (Network Functions Virtualization) and Cloud Implementations
- The differences between NFV and Traditional Network Design Deployments
- NFV Network Challenges
- NFV Example Use Cases
- Business Processes and SDN
- Change Management in SDN
- Six Sigma
- DevOps consideration
- Scrum & Agile in the age of SDN

Module 9: Introduction to OpenDaylight

- Setup
- Fundamentals for OpenDaylight Programming
- Maven and project building
- Karaf and feature creation
- Config subsystem
- Mininet
- Introduction to OpenDaylight Architecture
- Model-driven SAL (MD-SAL)
- YANG model
- Instance identifiers
- Data store transactions
- Advanced YANG operations
- Northbound and Southbound plugins
- Basic steps to writing an OpenDayLight Application
- Define data model
- Activation
- Event handlers and other call backs
- Sample Applications
- Tap application
- Learning Switch
- Other Prewritten Applications
- NETCONF protocol support
- ARP handler, host tracking
- Link Discovery
- API data model documentation (apidocs)

Module 10: OpenDaylight Southbound API

- OpenFlow
- NETCONF Connector

Module 11: OpenDaylight Northbound API

- RESTconf
- NETCONF

Module 12: Observing and Debugging OpenDaylight

Module 13: Writing an Application Using OpenDaylight