

Exploring Software-Defined Networking (SDN) for Network Operators

Instructor Led | Duration: 2 Days | Course Number: NWV_704c



Software Defined Networking (SDN) has recently gained traction in the telecom industry. Standards and implementations of SDN are still evolving as the industry grapples with this potentially significant technology transformation. SDN proposes to take the traditional implementation of the networking and dis-assemble it. SDN is a collection of technologies that split the data, control and management planes of the network. By doing this, the expectation is that it will improve network flexibility, manageability and allow the network administrator to customize the operations and services of the network on a large scale. Recent developments and the use of virtualization and Cloud Computing are some of the key enablers of this transformation.

Intended Audience

This is a technical overview for network operators. It is intended for a technical audience that has knowledge of packet networking and an interest in understanding key concepts in Software Defined Networking (SDN).

Learning Objectives

After completing this course, the student will be able to:

- Describe Software-Defined Networking
- List the motivations for SDN
- List the competing standards for SDN
- Sketch the SDN architecture
- Discuss the Southbound Protocols
- List the operational difference between the Southbound Protocols
- Discuss the role of OpenStack in SDN
- Identify SDN Use Cases applicable to a network operator
- Sketch an end-to-end SDN architecture in service provider's network

Suggested Prerequisites

- Technology Primer: Cloud and Virtualization (Instructor Led)
- Technology Primer: NFV (Instructor Led)
- Technology Primer: Software Defined Networking (Instructor Led)

Course Outline

1. SDN Architecture

- 1.1. SDN architecture overview
- 1.2. SDN Deployment Flavors
 - 1.2.1. Data Center vs WAN
- 1.3. SDN Principles

2. SDN Interfaces

- 2.1. Northbound and Southbound interfaces
- 2.2. OpenFlow and alternatives
- 2.3. SDN controller examples

3. SDN Operations

- 3.1. Separation of Control and Data Plane
- 3.2. Intent-based Networking
- 3.3. SDN Management protocols
- 3.4. Service Chaining

4. YANG for Data modeling

- 4.1. Role of YANG in Data modeling
- 4.2. YANG model overview
- 4.3. Public YANG Models

5. NETCONF Operations

- 5.1. NETCONF Overview
- 5.2. Configuration and state data
- 5.3. NETCONF Operations

6. SDN in Data Center

- 6.1. Configuration of NFVI
 - 6.1.1. OpenFlow
- 6.2. Networking for the VM
- 6.3. SDN and VIM Interworking

7. SDN and Inter-Data Center Connectivity

- 7.1. Overlay vs Underlay
- 7.2. Overlay-Underlay coordination

8. SDN in the WAN

- 8.1. Multi-layer requirements
- 8.2. SDN for Packet SDN
 - 8.2.1. SDN and MPLS
 - 8.2.2. Segment Routing
- 8.3. SDN for Optical networks

9. Service Orchestration

- 9.1. SDN hierarchy
- 9.2. Service Chaining using orchestrator
- 9.3. NFV, SDN and Orchestration