

Exploring Software-Defined Networking (SDN) for Network Operators

Instructor Led | Duration: 2 Days | Course Number: NWW_704c



Software Defined Networking (SDN) is a relatively new concept within the industry and has recently gained traction. 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
- Discuss some applications for SDN
- Discuss the requirements on the Northbound API
- Identify SDN Use Cases applicable to a network operator

Suggested Prerequisites

- [IPC_103] Welcome to IP Networking (eLearning) or equivalent prior knowledge

Course Outline

1. SDN in Network Transformation

- 1.1. SDN , NFV, Cloud

2. SDN Overview

- 2.1. What is SDN?
- 2.2. SDN benefits and challenges
- 2.3. Supporting standards
- 2.4. SDN in DC and WAN

3. SDN Architecture

- 3.1. SDN architecture and framework
- 3.2. SDN deployment options
- 3.3. SDN principles
- 3.4. SDN interfaces (No; So; East; West)
- 3.5. OpenFlow alternatives
- 3.6. Use case - Mobile traffic management

4. SDN Operation

- 4.1. Separation of control plane and data plane
- 4.2. Network Virtualization layer (FlowVisor)
- 4.3. Key SDN protocols
- 4.4. SDN traffic flow
- 4.5. Services and services chaining
- 4.6. Migration to SDN
- 4.7. Use Case - Increasing WAN utilization

5. SDN Programmability

- 5.1. Traditional programmability
- 5.2. Modern (SDN) programmability
 - 5.2.1. Characteristics
 - 5.2.2. Pub-sub (loose coupling)
 - 5.2.3. Example: Traffic steering
 - 5.2.4. OpenStack and SDN
 - 5.2.5. I2RS and PCEP
 - 5.2.6. Service chaining
- 5.3. Use Case - Inter-cell interference management
- 5.4. Use case CellSDN architecture

6. SDN Configuration vs. Control

- 6.1. Benefits of centralized control
- 6.2. Configuration protocols
- 6.3. Control protocols
- 6.4. Configuration and control together
- 6.5. Switch statistics vs. configuration vs. control
- 6.6. Information feedback to OAM
- 6.7. Demonstration - YANG and NETCONF