

NFV Application Planning and Design Workshop

Instructor Led | Duration: 3 Days | Course Number: NWW_407



As Wireless, Wireline and Cable service providers transform their networks with the deployment of SDN and NFV, the challenge of network planning moves from an individual network function perspective to that of the Network Functions Virtualization Infrastructure (NFVI) perspective. This course is focused on the computer, networking, and storage requirements that the NFVI needs to support to operate and deploy all the VNFs. The course covers the fundamental differences in planning between PNF and VNF for capacity, availability, and reliability as well as application performance. Student team and lab-based exercises will reinforce the course material. The class is focused on student hands-on exercises. The exercises will be both workbook team-based exercises as well as interactive lab exercises. The lab exercises will focus on the role OpenStack Heat and Ceilometer play in automating the virtualized network performance and reliability activities.

Intended Audience

This session is intended for leaders in technology organizations interested in learning about the technologies and drivers for Network Virtualization at Wireless, Wireline and Cable service providers.

Learning Objectives

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

- Illustrate the difference in network planning of PNFs and VNFs
- List the resource planning models for compute, network, and storage of the NFVI
- Demonstrate the role of OpenStack Heat and Ceilometer in managing a virtualized network
- Compare and contrast the VNF deployment options on NFVI planning
- Identify the role of SDN on network resource planning
- Illustrate the impact of orchestration on NFVI planning including the resources required to run the NFV-O
- List impact of the deployment and architectural choices on NFVI resources

Suggested Prerequisites

- [NWW_405] OpenStack Workshop for SDN and NFV (Instructor Led)
- [NWW_304] SDN and NFV Architecture and Operations (Instructor Led)

Course Outline

1. NFV Planning Overview

- 1.1. Fundamental Shifts
- 1.2. Panoramic View of Planning
- 1.3. NFV Architecture
- 1.4. Overview of OpenStack

Exercise: Student Intro to Lab

2. HOT and More

- 2.1. NFV Automation
- 2.2. Heat, HOT and YAML
- 2.3. Ceilometer
- 2.4. HOT Scenarios and Deep Dive

Exercise: Exploring HEAT Template

3. Capacity and Performance

- 3.1. Performance Degradation, Recovery
- 3.2. Performance Enhancement Process
- 3.3. Workloads
- 3.4. NFV Reliability

4. VNF Planning

- 4.1. Day in the Life of a VNF
- 4.2. VNF Deep Dive
- 4.3. Impact of Aggregation

Exercise: Tools - "stress-ng" and "tload"

5. VNF Monitoring and Scaling

- 5.1. Monitoring
- 5.2. Scaling Philosophies
- 5.3. Scaling Basics
- 5.4. Scaling Pitfalls

6. Infrastructure Planning

- 6.1. NFVI Physical Infrastructure
- 6.2. Node configuration Examples
- 6.3. Forecasting Basics

7. Compute Node

- 7.1. Compute Node Architecture and Planning
- 7.2. Live migration
- 7.3. Impact of Over-Commitment
- 7.4. Sizing the Compute Node

Exercise: Auto-scaling

8. Performance, Monitoring and KPIs

- 8.1. KPIs, Performance Enhancement
 - 8.1.1. Hardware-based
 - 8.1.2. Software-based
 - 8.1.3. Scheduling
- 8.2. Hypervisor and Performance

9. Cloud Controller Node

- 9.1. Cloud Controller Node Architecture
- 9.2. OpenStack Basics and NFV
- 9.3. Cloud Control Node sizing issues

10. Network and SDN

- 10.1. Network Node Architecture
- 10.2. NFV Networks
- 10.3. SDN Overview
- 10.4. SDN Controller Alternatives
- 10.5. NFVI Network Reliability

Exercise: HA and LB Exercise