

Network Automation using Contrail Cloud (NACC)

Course Overview

This five-day course is designed to provide students with the knowledge required to work with the Juniper Contrail software-defined networking (SDN) solution. Students will gain in-depth knowledge of how to use the OpenStack and Contrail Web UIs, APIs and CLI to perform the required tasks. Through demonstrations and hands-on labs, students will gain experience with the features of Contrail. This course is based on Contrail Release 3.2.0.

Objectives

After successfully completing this course, you should be able to:

- Explain the need for SDN.
- Explain the main SDN concepts.
- Describe common types of SDN.
- Explain why the NFV architecture was created.
- Describe the main NFV components.
- Give examples of Virtualized Network Functions.
- Describe the purpose of OpenStack.
- Identify the function of each of the main OpenStack Projects.
- Use the OpenStack CLI.
- Describe OpenStack REST APIs and Python SDK.
- Use OpenStack Heat Orchestration Templates.
- Configure OpenStack using Horizon Web UI and Heat.
- Describe the purpose of Contrail and how Contrail fits into the NFV Architecture.
- Explain how the versions of Contrail differ.
- Describe the functions of the Contrail vRouter and Contrail Controller.
- Explain the role of the control, configuration, and analytic nodes in Contrail.
- Configure and deploy virtual DNS and IPAMs.
- Create virtual networks in Contrail Cloud.
- Create policies to control the flow of traffic in Contrail Cloud.
- Configure Floating IPs in Contrail Cloud.
- Create simple virtual gateways and physical gateways in Contrail Cloud.
- Explain Docker integration with Contrail.
- Describe additional Contrail deployment options.
- Describe the difference between service chain version 1 and version 2.
- Create in-network and transparent service chains in Contrail Cloud.
- Create service chains that include VMs, containers and physical devices.
- Troubleshoot service chain creation issues in Contrail Cloud.
- Use analytics tools to monitor Contrail.
- Configure Contrail Analytics.
- Use Contrail analytics API.
- Configure alerts in Contrail.
- Navigate the Contrail's underlay overlay mapping tools.
- Perform Contrail installation using fab scripts.
- Perform Contrail installation using Server Manager.



Course Length

5 days

Intended Audience

This course benefits individuals responsible for working with software-defined networking solutions in data center, service provider, and enterprise network Environment.

Course Level

Network Automation using Contrail Cloud (NACC) is an intermediate-level course.

Prerequisites

The prerequisites for this course are as follows:

- Basic TCP/IP skills;
- General understanding of data center virtualization;
- Basic understanding of the Junos operating system;
- Attendance of the Introduction to the Junos Operating System (IJOS) course prior to attending this class; and
- Basic knowledge of object-oriented programming and Python scripting is recommended.


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Course Contents

Day 1

Chapter 1: Course Introduction

Chapter 2: SDN Fundamentals

- The Need for SDN
- SDN Explained
- Open SDN
- SDN as an Overlay
- SDN via API
- SDN for the WAN

Chapter 3: Network Function Virtualization

- Introduction to NFV
- NFV Architecture
- Examples of VNFs

Chapter 4: OpenStack Fundamentals

- OpenStack Overview
- OpenStack Projects
- Exploring OpenStack Installation and Using CLI
- Lab 1: Exploring OpenStack with the CLI

Chapter 5: OpenStack Configuration

- OpenStack Interface Options
- Using OpenStack Heat Templates
- OpenStack Configuration
- Lab 2: Configuring OpenStack

Day 2

Chapter 6: Contrail Solution Overview

- Contrail Use Cases
- Contrail Solution Overview
- Contrail Related Solutions

Chapter 7: Contrail Architecture Fundamentals

- Contrail vRouter
- Contrail SDN Overlay Controller
- Lab 3: Exploring and Troubleshooting the Contrail vRouter and SDN Controller

Chapter 8: Contrail Virtual Networks

- IPAM and DNS
- Virtual Networks in Contrail
- Network Policies
- Contrail Heat Overview
- Lab 4: Virtual Networks and Policies

Day 3

Chapter 9: Interacting with External Networks

- Floating IPs
- Connecting to Gateway Devices using Device Manager
- Configuring Simple Virtual Gateway
- Lab 5: Creating Floating IPs and Gateways

Chapter 10: Contrail Network Service Deployment Options

- Using Docker Containers with Contrail
- BGP as a Service
- LBaaS
- DPDK vRouter Overview
- Contrail Global Controller Overview
- Lab 6: Using Docker Containers with Contrail

Day 4

Chapter 11: Contrail Service Chains

- Service Chain Modes and Versions
- In-Network Service Chains
- Transparent Service Chains
- Lab 7: Creating Contrail Service Chains

Chapter 12: Advanced Service Chaining

- Source NAT Service Chain
- Service chain With Docker Containers
- Service Chains That Include Physical Routers
- Troubleshooting Service Chains
- Lab 8: Troubleshooting Contrail Service Chains

Day 5

Chapter 13: Contrail Monitoring and Analytics

- Analytics Review
- Using Analytics to Monitor and Troubleshoot the System
- Debugging processes using the Contrail Introspect
- Configuring Contrail Analytics
- Lab 9: Using Contrail Analytics

Chapter 14: Analyzing Network State and Traffic Flows

- Contrail Analytics API
- Contrail Alerts
- Analyzing Live Traffic
- Underlay Overlay Mapping in Contrail
- Lab 10: Analyzing Traffic Flows with Contrail Analytics

Appendix A: Contrail Installation Walk-Through

- Installation using Fab Scripts
- Installation using Server Manager Lite
- Lab 11: Installing Contrail

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