

Network Automation using the Contrail Controller (NACC)

Engineering Simplicity

COURSE LEVEL

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

AUDIENCE

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

PREREQUISITES

- Basic TCP/IP skills;
- General understanding of data center virtualization;
- Basic understanding of the Junos operating system;
- Completion of the *Junos Cloud Fundamentals (JCF)* course prior to attending this class; and
- Basic knowledge of object-oriented programming and Python scripting is recommended.

ASSOCIATED CERTIFICATION

JNCIS-Cloud

RELEVANT JUNIPER PRODUCT

- Automation
- SDN
- Software
- Contrail
- Instructor-Led Training

RECOMMENDED NEXT COURSE

Network Automation in the Enterprise Cloud (NAEC)

CONTACT INFORMATION

training@juniper.net

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, Contrail, and Contrail Command UIs. Students will also learn to use APIs and the CLI to perform the Contrail configuration tasks. Through demonstrations and hands-on labs, students will gain experience with the features of Contrail. This course is based on Contrail Release 5.1.

OBJECTIVES

- Explain the definition and main principles of SDN.
- Discuss the NFV framework.
- Explain the role of Contrail SDN Controller.
- List available Contrail solutions.
- 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 main features of Contrail.
- Discuss different Contrail use cases.
- Describe Contrail related solutions.
- Describe the functions of the Contrail vRouter.
- Describe the functions of the Contrail SDN Controller.
- Understand containerized Contrail modules.
- Explain the role of different node types in Contrail.
- Use Contrail troubleshooting tools.
- Describe available Contrail configuration methods.
- Configure Contrail Virtual DNS services.
- Create virtual networks.
- Create policies to control the flow of traffic.
- Use Contrail Configuration API.
- Explain how virtual and physical networks can be connected.
- Configure Floating IPs.
- Use physical gateway devices with Contrail.
- Configure physical devices with Device Manager.
- Use simple virtual gateway.
- Explain underlay connectivity without gateway.
- Explain Contrail integration with Kubernetes and OpenShift.
- Use BGP as a Service feature.
- Understand Graceful Restart Capabilities.
- Describe QoS support in Contrail.
- Understand Load Balancing as a Service.
- Describe vRouter support for DPDK, SR-IOV and SmartNICs.
- Understand Contrail Global Controller.
- Describe service chaining within Contrail.
- Understand service chains version 1 and version 2.
- Configure In-Network service chains.
- Configure transparent service chains.
- Configure Source NAT.
- Use Heat to automate service deployment.
- Understand details of service chain routing.
- Use routing policies.
- Troubleshoot service chains.
- Explain the use of Docker containers in service chains.
- Describe Physical Network Function integration.
- Explain routing traffic from physical network via Contrail service chain.
- Explain the functions of Contrail Analytics.
- Describe how to work with the Monitor workspace.
- Discuss how to run flow queries and examine system logs.
- Use Contrail Analytics API.

OBJECTIVES (contd.)

- Work with Contrail Alarms.
- Understand how to analyze live traffic with Contrail.
- Describe Underlay Overlay mapping.
- Explain the need for Contrail Security.
- Discuss multidimensional firewall policy configuration.
- Use tags and labels.
- Discuss traffic visualization with Contrail Security.

COURSE CONTENT

Day 1

1	COURSE INTRODUCTION
2	SDN, NFV, and Contrail <ul style="list-style-type: none"> • Review of SDN and NFV • Contrail Solution Overview
3	OpenStack Fundamentals <ul style="list-style-type: none"> • OpenStack Overview • OpenStack Projects • Exploring OpenStack Installation and Using CLI Lab 1: Exploring OpenStack with the CLI

4	OpenStack Configuration <ul style="list-style-type: none"> • OpenStack Interface Options • Using OpenStack Heat Templates • OpenStack Configuration Lab 2: Configuring OpenStack
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Day 2

5	Contrail Overview <ul style="list-style-type: none"> • Contrail Use Cases • Contrail Solution Overview • Contrail Related Solutions
6	Contrail Architecture Fundamentals <ul style="list-style-type: none"> • Contrail Architecture Overview • Contrail Management and Analytics • Contrail Control Plane • Contrail Data Plane • Basic Contrail Troubleshooting Lab 3: Exploring and Troubleshooting the Contrail vRouter and SDN Controller

7	Contrail Configuration Basics <ul style="list-style-type: none"> • Contrail Configuration Methods • vRouter Services • Configuring Virtual Networks • Configuring Network Policies and Security Groups • Contrail API Python Library Lab 4: Virtual Networks and Policies
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Day 3

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Interacting with External Networks

- Connecting Virtual and Physical Networks
- Floating IPs
- Using Device Manager
- Configuring Simple Virtual Gateway
- Underlay Connectivity without Gateway

Lab 5: Creating Floating IPs and Gateways

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Contrail Network Services

- Contrail and Container Networking
- BGP as a Service
- Graceful Restart Capabilities
- Implementing CoS
- Load Balancing as a Service Overview
- vRouter Support for DPDK and SR-IOV
- Contrail Global Controller Overview

Lab 6: Using Docker Containers with Contrail

Day 4

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Contrail Service Chains

- Service Chaining Overview
- In-Network Service Chain and Configuration
- Transparent Service Chain and Configuration
- Configuring Source NAT
- Automating Service Chaining

Lab 7: Creating Contrail Service Chains

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Advanced Service Chaining

- Advanced Operation
- Service Instance Health Checks
- Troubleshooting Service Chains
- Service Chain with Docker Containers
- Physical Network Function Integration
- NFV for ISP Case Study

Lab 8: Advanced Service Chain Operation and Troubleshooting

Day 5

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Contrail Monitoring and Analytics

- Analytics Overview
- Monitor > Infrastructure Workspace
- Monitor > Networking Workspace
- Flow Queries, Logs, and Statistics
- Configuring Contrail Analytics
- Analytics API

Lab 9: Using Contrail Analytics

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Contrail Security

- The Need for Contrail Security
- Contrail Security Configuration
- Monitoring and Visualization

- Contrail Alarms
- Analyzing Live Traffic
- Underlay Overlay Mapping

Lab 10: Analyzing Traffic Flows with Contrail Analytics