Cloud Automation Using Contrail (CAC)

Engineering Simplicity

COURSE LEVEL

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 or equivalent knowledge
- Completion of the *Data Center Fabric with EVPN and VXLAN* (ADCX) course or equivalent knowledge
- Basic knowledge of object-oriented programming and Python scripting is recommended

ASSOCIATED CERTIFICATION

JNCIS-Cloud

RELEVANT JUNIPER PRODUCT

- Automation
- SDN
- Software
- Contrail

RECOMMENDED NEXT COURSE

Network Automation in the Enterprise Cloud (NAEC)

CONTACT INFORMATION

[Contact Juniper Education Services](#)

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 Contrail Command user interface, Contrail Networking, Contrail's fabric management and administration features, and Contrail Security, as well as AppFormix analytics features. 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 and AppFormix. This course is based on Contrail Release 1912 and AppFormix 2.19.10.

OBJECTIVES

- Explain the role of Contrail SDN Controller.
- List available Contrail solutions.
- Describe the purpose of an orchestrator.
- Describe the basics of Kubernetes.
- Identify the function of each of the main OpenStack Projects.
- Describe the purpose of Contrail.
- Explain how the versions of Contrail differ.
- Discuss Contrail related solutions.
- Describe the functions of the Contrail vRouter and Contrail Controller.
- Explain the role of the control, configuration, and analytic nodes.
- Configure and deploy virtual DNS and IPAMs.
- Create virtual networks.
- Create policies to control the flow of traffic.
- Explain the routing behavior of an IP Fabric.
- Describe the steps to onboard a Brownfield IP Fabric.
- Describe the steps to onboard a Greenfield IP Fabric.
- Describe the various commands to troubleshoot the onboarding of an IP Fabric.
- Explain the benefits of VXLAN in the data center.
- Describe EVPN signaling for VXLAN.
- Describe how CEM can bridge between a VM and a BMS.
- Implement bridging between VMs and BMSs using VXLAN and EVPN signaling.
- Describe EVPN signaling for VXLAN routing in the Spine.
- Describe how to enable central routing using CEM.
- Describe EVPN signaling for DCI.
- Describe how to enable DCI using CEM.
- Create physical gateways.
- Describe architecture and capabilities of Contrail Security.
- Configure main Contrail Security features.
- Explain the benefits of AppFormix.
- Explain the operation and use of AppFormix.
- Explain how to setup and install AppFormix in different environments.
- Explain the purpose and use of the different AppFormix features.
- Understand the purpose of the Clusters feature.

OBJECTIVES (contd.)

- Describe dashboard use to examine the state of the network.
- Understand the purpose and use of the Charts feature.
- Explain the benefits of capacity planning.
- Explain how to setup the chargeback functionality.
- Explain how to use AppFormix charts.
- Explain how to use AppFormix heat maps.
- Describe the benefits of reports and service monitoring functionalities.
- Explain the purpose and use of AppFormix alarms.
- Explain the purpose and use of AppFormix Composite Alarms.
- Explain the purpose of JTI.
- Discuss native sensors.
- Explain OpenConfig and gRPC sensors.
- Describe best practices for JTI.
- Explain how to use JTI with AppFormix.

COURSE CONTENT

Day 1

1	**Course Introduction**

2	**SDN and Contrail** • Review of SDN • Contrail Basics • Contrail Advantages, Capabilities, and Features • Contrail Products and Solutions • Contrail Use Cases • Contrail Command **Lab 1: Contrail Command Walkthrough**

3	**Orchestration Fundamentals** • Orchestrator Overview • Kubernetes Orchestrator • OpenStack Orchestrator **Lab 2: Instantiating Virtual Workloads**

Day 2

4	**Contrail Architecture Fundamentals** • Contrail Architecture Overview • Contrail Management and Analytics • Contrail Control Plane Communications • Contrail Data Plane Communications • Basic Contrail Troubleshooting **Lab 3: Exploring and Troubleshooting the Contrail vRouter and SDN Controller**

5	**Contrail Configuration** • Contrail Configuration Methods • Configuring DNS and IPAM • Configuring the Metadata Service • Configuring Virtual Networks • Configuring Network Policies and Security Groups • Contrail Configuration API **Lab 4: Configuring Virtual Networks and Policies**

6	**IP Fabric Automation** • IP Fabric Review • Greenfield Fabric Automation • Brownfield Fabric Automation • Troubleshooting Fabric Automation **Lab 5: IP Fabric Automation**

Course content subject to change. See www.juniper.net/courses for the latest details.

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COURSE CONTENT (contd.)

Day 3

7   **VM to BMS Bridging**

- VXLAN Review
- EVPN Signaling for BMS to BMS VXLAN Forwarding
- Contrail VM to BMS Bridging
- Server/Instance Example
- Virtual Port Groups

Lab 6: VM to BMS Bridging

8   **VXLAN Routing**

- EVPN Signaling for Central Routing
- Central Routing Example
- EVPN Signaling for Edge Routing
- Edge Routing Example

Lab 7: VXLAN Routing

9   **Data Center Interconnect**

- DCI Overview
- DCI Options for a VXLAN Overlay using Contrail Automation
- DCI Example using Contrail Automation

Lab 8: Data Center Interconnect

Day 4

10   **Interacting with External Networks**

- DC Gateway Use Case
- Implementing a DC Gateway

Lab 9: DC Gateway

11   **Fabric Administration**

- Generic Device Operations
- Hitless Fabric Upgrade

Lab 10: Fabric Administration

12   **Contrail Security**

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

Lab 11: Contrail Security

Day 5

13   **AppFormix Overview**

- AppFormix Overview
- AppFormix UI and General Settings
- AppFormix Features Overview — Clusters, Dashboard, Charts, Heat Map, Plan, Reports, Chargeback

14   **Alarms and Composite Alarms**

- Alarms
- Alarms Case Study
- Composite Alarms

Lab 13: Implementing AppFormix Features

15   **Junos Telemetry Interface**

- JTI Overview
- Native Sensors for JTI
- OpenConfig and gRPC Sensors for JTI

Lab 12: Implementing JTI with AppFormix

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