Implementing Data Center Fabric with EVPN and VXLAN

COURSE OVERVIEW

This five-day, advanced-level course provides in-depth instructions on IP fabric and Ethernet VPN–Virtual Extensible LAN (EVPN-VXLAN) data center design and configuration. The course covers other data center concepts, including basic and advanced data center design options that include collapsed spine and super spine architectures, Data Center Interconnect (DCI), EVPN multicast enhancements, and seamless EVPN-VXLAN stitching. Through demonstrations and hands-on labs, students will gain experience with these features.
This content is based on vEX9214s running Junos OS Release 23.4R1.10.
Note: This course does not cover Juniper Apstra. For Juniper Apstra coverage, see *Data Center Automation Using Juniper Apstra*

COURSE LEVEL

Advanced

AUDIENCE

Individuals responsible for this course includes data center implementation engineers and data center design engineers.

PREREQUISITES

- Understanding of the OSI model
- Advanced routing knowledge—the *Advanced Junos Enterprise Routing* course or equivalent knowledge strongly recommended
- Intermediate switching knowledge—the *Junos Enterprise Switching Using Enhanced Layer 2 Software* or equivalent knowledge
- Intermediate to advanced Junos CLI experience

RELATED CERTIFICATION

JNCIP-DC Certification | Juniper Networks US

RELATED JUNIPER PRODUCTS

ACX Series ,EX Series, Juniper Apstra, Junos OS, MX Series, Network Design, PTX Series, QFX Series, SRX Series

OBJECTIVES

- Describe basic and advanced data center design concepts.
- Describe and configure an IP fabric.
- Describe and configure an EVPN-VXLAN data center.
- Describe and configure enhanced loop protection.
- Describe and configure centrally routed bridging (CRB) EVPN-VXLAN.
- Describe and configure edge-routed bridging (ERB) EVPN-VXLAN.
- Describe and configure symmetric EVPN Type 2 routing.
- Describe and configure DCI.
- Describe and configure seamless EVPN-VXLAN stitching.
- Describe and configure filter-based forwarding.
- Describe enhancements to multicast functionality in an EVPN-VXLAN.

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Course Outline

COURSE CONTENTS

DAY 1

Module 1: Modern Architectures

- Describe traditional multitier architecture challenges
- Explain next-generation data center architectures

Module 2: IP Fabric Underlay Routing

- Describe what an IP fabric is
- Explain routing in an IP fabric

Module 3: IP Fabric Underlay Scaling

- Explain how to properly scale an IP fabric

Module 4: IP Fabric Underlay Configuration

- Explain how to configure an OSPF-based IP fabric underlay network
- Describe how to configure an EBGP-based IP fabric underlay network

Lab 1: IP Fabric

Module 5: VXLAN Overview

- Explain Layer 2 connectivity over a Layer 3 network
- Describe VXLAN Fundamentals

Module 6: VXLAN Gateways

- Describe the purpose and function of VXLAN gateways

Module 7: EVPN Overview

- Describe EVPN functionality
- Describe EVPN control in a VXLAN deployment

DAY 2

Module 8: EVPN Protocol

- Describe EVPN routing and bridging

Module 9: Configuring EVPN-VXLAN Networks

- Discuss how to configure EVPN-controlled VXLAN

Lab 2: Configuring EVPN-VXLAN Networks

Module 10: Enhanced Ethernet Segment Loop Protection

- Describe the loop potential
- Describe and configure the ES loop-detect protocol

Module 11: Basic Data Center Architectures

- Describe basic architectures and deployment scenarios

Module 12: Configuring a Collapsed Spine

- Describe a collapsed spine architecture
- Configure an underlay network
- Configure an overlay network
- Configure Layer 2 to Layer 3 gateways
- Verify the VXLAN communications

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Module 13: Super Spine Configuration

- Describe a super spine architecture
- Configure a super spine

DAY 3

Module 14: Configuring Centrally Routed Bridging

- Describe EVPN-VXLAN reference architectures
- Describe centrally routed and bridging
- Configure centrally routed and bridging

Lab 3: Configure Centrally Routed Bridging

Module 15: Configuring Edge-Routed Bridging

- Describe edge-routed bridging
- Explain how to configure edge-routed bridging
- Explain how to verify edge-routed bridging operations

Lab 4: Configuring Edge-Routed Bridging

Module 16: MAC-VRF Overview

- Describe the benefits of deploying MAC-VRFs
- Identify data center architectures for MAC-VRF use
- Describe the MAC-VRF design options

Module 17: MAC-VRF Configuration

- Describe the requirements of deploying MAC-VRFs
- Describe the MAC-VRF use case
- Configure common parameters
- Configure a VLAN-based MAC-VRF
- Configure a VLAN-aware MAC-VRF
- Configure a VLAN-bundle MAC-VRF

Lab 5: MAC-VRF Configuration

Module 18: Symmetric Routing Using Type 2 EVPN

- Describe asymmetric routing
- Describe symmetric routing
- Implement symmetric routing

Lab 6: Symmetric Routing Configuration

DAY 4

Module 19: DCI with EVPN–VXLAN Network

- Discuss DCI with EVPN-VXLAN Network

Module 20: Configuring DCI

- Discuss how to configure DCI in the data center

Lab 7: Data Center Interconnect

Module 21: Seamless EVPN-VXLAN Stitching

- Explain the purpose of seamless EVPN-VXLAN stitching
- Discuss seamless EVPN-VXLAN design options
- Describe a packet walkthrough for seamless EVPN-VXLAN stitching

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Module 22: Configuring Seamless EVPN-VXLAN Stitching

- Explain how to configure seamless EVPN-VXLAN stitching
- Describe how to verify EVPN-VXLAN stitching operations

Lab 8: Implementing Seamless EVPN-VXLAN Stitching

DAY 5

Module 23:Filter-Based Forwarding

- Discuss the purpose of filter-based forwarding in a data center
- Explain how to configure filter-based forwarding in a data center
- Describe how to verify filter-based forwarding in a data center

Lab 9: Implementing Filter-Based Forwarding

Module 24:EVPN Multicast Extensions

- Describe the multicast extensions to EVPN

Module 25:EVPN Multicast Configuration

- Explain how to configure EVPN multicast

Module 26:EVPN Multicast Assisted Replication

- Describe the potential problem with EVPN multicast
- Illustrate a use case
- Describe assisted replication
- Configure assisted replication
- Describe assisted replication with SMET

SELF-STUDY MODULES

Module 27:VXLAN Group-Based Policy—Introduction

- Describe an overview of VXLAN group-based policies
- Describe the benefits of VXLAN group-based policies
- Configure a VXLAN group-based policy filter

Module 28:Zero-Touch Provisioning

- Explain zero-touch provisioning
- Configure a QFX5100 Series switch using ZTP

Module 29:Troubleshooting Basics

- Describe troubleshooting tools
- Explain a basic troubleshooting approach

Module 30:Data Center Devices

- Describe fixed format platforms
- Describe modular platforms
- Describe virtual platforms

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