Implementing Data Center Fabric with EVPN and VXLAN, Revision 26A

COURSE OVERVIEW

This five-day advanced level course provides in-depth instruction 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 superspine 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 virtual Juniper Networks® EX9214 Switch devices running Junos OS Release 25.2R1.8.
Note: This course does not cover Juniper Apstra. For Juniper Apstra coverage, see ***Data Center Automation Using Juniper Apstra.***

COURSE LEVEL

Implementing Data Center Fabric with EVPN and VXLAN is an advanced-level course.

AUDIENCE

The primary audience 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*** course or equivalent knowledge.
- Intermediate to advanced Junos CLI experience.
- Recommended courses but not required:
  - ***Introduction to Juniper Data Center Networking*** course
  - ***Introduction to Session Smart Routing On-Demand*** course or equivalent knowledge and experience
  - ***Juniper Security*** course or equivalent knowledge and experience.

RELATED JUNIPER PRODUCTS

Juniper virtual EX Series devices, Juniper virtual SRX Series devices, Junos OS

RELATED CERTIFICATION

JNCIP-DC

RECOMMENDED NEXT COURSE

Data Center Automation Using Juniper Apstra. and ***Advanced Data Center Automation using Juniper Apstra***

OBJECTIVES

- Describe basic and advanced data center design concepts.
- Describe and configure an EBGP IP fabric.
- Describe and configure an EVPN-signaled network.
- Describe and configure a VXLAN overlay network.
- Describe and configure enhanced loop protection.
- Describe and configure a collapsed spine.
- Describe and configure a super spine network.
- Describe and configure centrally routed bridging (CRB) EVPN-VXLAN.
- Describe and configure edge-routed bridging (ERB) EVPN-VXLAN.
- Describe and configure MAC-VRF routing instances.
- Describe and configure symmetric EVPN Type 2 routing.
- Describe and configure data center interconnects.
- Describe and configure seamless EVPN-VXLAN stitching.
- Describe and configure filter-based forwarding.
- Describe enhancements to multicast functionality in an EVPN-VXLAN network.

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COURSE CONTENTS

DAY 1

Module 01: Modern Architectures

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

Module 02: IP Fabric Underlay Routing

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

Module 03: IP Fabric Underlay Scaling

- Explain how to properly scale an IP fabric

Module 04: 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 01: IP Fabric

Module 05: VXLAN Overview

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

Module 06: VXLAN Gateways

- Describe the purpose and function of VXLAN gateways

Module 07: EVPN Overview

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

DAY 2

Module 08: EVPN Protocol

- Describe EVPN routing and bridging

Module 09: Implementing BGP-EVPN Signaling for VXLAN Overlay Networks

- Discuss CLI configurations for both IBGP and EBGP signaling
- Configure an IBGP-based EVPN-signaling for a VXLAN-Overlay
- Configure an EBGP-based EVPN-signaling for a VXLAN overlay
- Verify that the correct sessions are established

Module 10: Configuring EVPN-VXLAN Networks

- Verify that correct BGP sessions are established
- Configure EVPN-VXLAN
- Verify EVPN-VXLAN
- Configure ESI for multihomed devices

Lab 02: Configuring EVPN-VXLAN Networks

Module 11: Enhanced Ethernet Segment Loop Protection

- Describe the Ethernet segment loop potential
- Describe and configure the Ethernet segment loop-detect protocol

DAY 3

Module 12: Basic Data Center Architectures

- Describe basic architectures and deployment scenarios

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Module 13: Configuring a Collapsed Spine

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

Module 14: Superspine Configuration

- Describe a superspine architecture
- Configure a superspine

Module 15: Configuring Centrally Routed Bridging

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

Lab 03: Configuring CRB

Module 16: Configuring Edge-Routed Bridging

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

Lab 04: Configuring ERB

Module 17: 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 18: 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 05: MAC-VRF Configuration

Module 19: Symmetric Routing Using Type 2 EVPN

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

Lab 06: Implementing Symmetric Routing

DAY 4

Module 20: DCI with EVPN-VXLAN Network

- Discuss DCI with EVPN-VXLAN network

Module 21: Configuring DCI

- Discuss how to configure DCI in the data center

Lab 07: Data Center Interconnect

Module 22: Seamless EVPN-VXLAN Stitching

- Explain the purpose of seamless EVPN-VXLAN stitching
- Discuss seamless EVPN-VXLAN design options

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- Describe a packet walkthrough for seamless EVPN-VXLAN stitching

Module 23: Configuring Seamless EVPN-VXLAN Stitching

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

Lab 08: Configuring Seamless EVPN-VXLAN Stitching

DAY 5

Module 24: 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 09: Implementing Filter-Based Forwarding

Module 25: EVPN Multicast Extensions

- Describe the multicast extensions to EVPN

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 common troubleshooting tools
- Explain a basic troubleshooting approach

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