Data Center Fabric with EVPN and VXLAN

COURSE OVERVIEW

This five-day course is designed to provide in-depth instruction on IP fabric and Ethernet VPN–Virtual Extensible LAN (EVPN–VXLAN) data center design and configuration. Additionally, the course will cover other data center concepts, including basic and advanced data center design options including 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 vQFXs running Junos OS Release 21.R1.9.

COURSE LEVEL

Advanced

AUDIENCE

- Data center implementation engineers
- Data center design engineers

PREREQUISITES

- Understanding of the OSI model
- Advanced routing knowledge – the *Advanced Junos Enterprise Routing* (AJER) course or equivalent knowledge strongly recommended
- Intermediate switching knowledge – the *Junos Enterprise Switching* (JEX) or equivalent knowledge
- Intermediate to advanced Junos CLI experience

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OBJECTIVES

- 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 filter-based forwarding.
- Describe and configure seamless EVPN VXLAN stitching.
- Describe basic and advanced data center design concepts.
- Describe and configure DCI.
- Describe enhancements to multicast functionality in an EVPN-VXLAN.

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COURSE CONTENTS

DAY 1

1 Course Introduction

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

3 IP Fabric Underlay Routing
- Describe IP fabric
- Explain routing in an IP fabric

4 IP Fabric Underlay Scaling
- Explain how to properly scale an IP fabric

5 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

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

DAY 2

7 Controller-Less VXLAN Overlay
- Describe the control plane and data plane of VXLAN in a controller-less overlay

8 VXLAN Gateways
- Describe the purpose and function of VXLAN gateways

9 EVPN Overview
- Describe EVPN functionality.
- Describe EVPN control in a VXLAN deployment.

10 EVPN Protocol
- Describe EVPN routing and bridging.

11 Configuring EVPN VXLAN
- Discuss how to configure EVPN controlled VXLAN

Lab 2: Configuring EVPN–VXLAN

DAY 3

12 Enhanced Loop Protection
- Describe the loop potential
- Describe and configure loop-detect protocol

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

14 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 3: Configure VLAN-Based MAC VRF

15 Basic Data Center Architectures
- Describe basic architectures and deployment scenarios

16 Configuring Central–Routed Bridging
- Describe central routing and bridging
- Configure central routing and bridging

Lab 4: Central Routing and Bridging

17 Configuring Edge–Routed Bridging
- Describe EVPN-VXLAN reference architectures
- Explain how to configure ERB
- Explain how to verify ERB operations

Lab 5: Configuring ERB

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COURSE CONTENTS (continued)

DAY 4

18 Configuring a Collapsed Spine

- Describe a collapsed spine architecture
- Implement a collapsed spine configuration

19 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 6: Implementing Filter-Based Forwarding

20 Super Spine Configuration

- Describe a super spine architecture
- Configure a super spine

21 EVPN Multicast Extensions

- Describe the multicast extensions to EVPN

22 EVPN Multicast Configuration

- Explain how to configure EVPN multicast

23 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

DAY 5

24 DCI Overview

- Describe the purpose of DCI

25 DCI EVPN–VXLAN

- Describe DCI with EVPN–VXLAN

26 Configuring DCI

- Discuss how to configure DCI on spine devices
- Discuss how to configure DCI on leaf devices
- Explain how to verify DCI operations

Lab 7: Data Center Interconnect

27 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

28 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.

A Appendix: Virtual Chassis Fabric

- Describe key concepts and components of a VCF
- Describe the control plane and forwarding plane of a VCF

B Appendix: Virtual Chassis Fabric Management

- Describe managing a VCF using the CLI
- Describe dynamically provisioning a VCF
- Explain pre-provisioning and auto provisioning a VCF
- Explain software requirements and upgrades

C Appendix: Zero-Touch Provisioning

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

D Appendix: Troubleshooting Basics

- Describe troubleshooting tools
- Explain a basic troubleshooting approach

E Appendix: Data Center Devices

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