

# Advanced Data Center Switching (ADCX)

Engineering Simplicity

## COURSE LEVEL

Advanced Data Center Switching (ADCX) begins at an intermediate-level course, and finishes at an advanced level.

## AUDIENCE

This course benefits individuals responsible for configuring, monitoring, and troubleshooting data center features that exist on the Junos OS running on data center-oriented platforms such as EX Series, QFX Series, MX Series, and vMX Series devices. This includes individuals in professional services, sales and support organizations, and the end users.

## PREREQUISITES

- Understanding of the OSI model;
- Advanced routing knowledge—the Advanced Junos Enterprise Routing (AJER) course or equivalent knowledge; and
- Intermediate switching knowledge—the Junos Enterprise Switching (JEX) or equivalent.

## ASSOCIATED CERTIFICATION

[JNCIP-DC](#)

## RELEVANT JUNIPER PRODUCT

- Automation
- Data Center
- Switching
- EX Series
- Junos OS
- MX Series
- QFX Series
- Data Center track

## RECOMMENDED NEXT COURSE

## CONTACT INFORMATION

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## COURSE OVERVIEW

This five-day course provides a comprehensive focus on Juniper Networks data center switching technologies. The first three days are designed to introduce the data center features including zero touch provisioning (ZTP), unified in-service software upgrade (ISSU), multichassis link aggregation (MC-LAG), Mixed Virtual Fabric, and Virtual Chassis Fabric (VCF) and provide students with knowledge of troubleshooting some of the key data center features including MC-LAG, Virtual Chassis, and VCF deployments. The last two days of the course are designed to introduce data center features that are more advanced including IP Fabric, Virtual eXtensible Local Area Network (VXLAN) Layer 2 and Layer 3 Gateways, VXLAN with Ethernet VPN (EVPN) signaling and Data Center Interconnect (DCI) for a VXLAN overlay. Students will learn to configure and monitor these features on the Junos operating system running on the QFX5100, EX4300, and vMX Series platforms. Through demonstrations and hands-on labs, students will gain experience configuring, monitoring, troubleshooting, and analyzing the mentioned features of the Junos OS. This content is based on Junos OS Release 17.1R1.8.

## OBJECTIVES

- List the various models of QFX5100 Series switches and explain how they solve current challenges.
- List some data center architecture options.
- Explain the purpose, components, and operations of ZTP.
- Deploy a QFX5100 Series switch using ZTP.
- Explain the purpose, components, and operations of ISSU.
- Upgrade a QFX5100 Series switch using ISSU.
- Explain the purpose, components, and operations of MC-LAG.
- Implement an MC-LAG on QFX5100 Series switches.
- Describe key concepts, components, and operation of a mixed Virtual Chassis.
- Implement a mixed Virtual Chassis and verify its operations.
- Describe Virtual Chassis Fabric concepts and components.
- Describe how to provision a Virtual Chassis Fabric using different methods.
- Describe the requirements and upgrade procedure of Virtual Chassis Fabric.
- Describe how to manage a Virtual Chassis Fabric with Junos Space.
- List and use available troubleshooting tools.
- Identify and resolve potential issues with MC LAG.
- Identify and resolve potential issues with Virtual Chassis.
- Identify and resolve potential issues with VCF.
- Describe the various data center fabric architectures.
- Explain and configure routing in an IP Fabric.
- Explain, configure, and monitor VXLAN when using multicast signaling.
- Describe configure, and monitor EVPN signaling for VXLAN.
- Describe the control and data plane of an MPLS VPN.
- Describe the DCI options when using a VXLAN overlay with EVPN signaling.

## COURSE CONTENT

### Day 1

#### 1 COURSE INTRODUCTION

#### 2 System Overview

- Traditional Multitier Architecture Challenges
- Next Generation data Center Fabrics
- QFX5100 Series Switches
- Additional Features

#### 3 Zero Touch Provisioning

- Understanding Zero Touch Provisioning
- ZTP in Action: A Working Example

#### 4 In-Service Software Upgrade

- Understanding ISSU on QFX5100 Series Switches
- ISSU in Action: A Working Example

#### LAB 2: In-Service Software Upgrade

### Day 2

#### 5 MC-LAG

##### MC-LAG Overview MC-LAG Operations Deploying MC-LAGs

#### LAB 3: MC-LAG

#### 6 Troubleshooting Multichassis LAG

- MC-LAG: An Operational Review
- Connections and Communications
- Troubleshooting Example

#### LAB 4: Troubleshooting Multichassis LAG

#### 7 Mixed Virtual Chassis

- Overview of Mixed Virtual Chassis
- Provisioning a Mixed Virtual Chassis
- Software Requirements and Upgrades
- Configuring and Monitoring a mixed Virtual Chassis

#### LAB 5: Mixed Virtual Chassis

## Day 3

### 8 Virtual Chassis Fabric

- Overview of Virtual Chassis Fabric
- VCF Control and Forwarding Plane

### 9 Virtual Chassis Fabric Management

- Managing a Virtual Chassis Fabric using the CLI
- Dynamically Provisioning a Virtual Chassis Fabric
- Preprovisioning and Autoprovisioning a Virtual Chassis Fabric
- Software Requirements and Upgrades
- Managing a Virtual Chassis Fabric with Space

#### LAB 6: Virtual Chassis Fabric

### 10 Troubleshooting Virtual Chassis Technologies

- Virtual Chassis Technology Review
- Processes and Components
- Troubleshooting Case Study

#### LAB 7: Troubleshooting Virtual Chassis Technologies

## Day 4

### 11 IP Fabric

- IP Fabric Overview
- IP Fabric Routing
- IP Fabric Scaling
- Configure an IP Fabric

- **LAB 8: IP Fabric**

### 12 VXLAN

- Layer 2 Connectivity over a Layer 3 Network
- VXLAN using Multicast Control Plane
- VXLAN Configuration

#### LAB 9: VXLAN

## Day 5

### 13 EVPN

- The Benefits of EVPN
- VXLAN using EVPN Control Plane
- EVPN/VXLAN Configuration

- **Lab 10: VXLAN and EVPN Signaling**

### 14 Data Center Interconnect

- DCI Overview
- MPLS VPN Review
- DCI Options for a VXLAN Overlay

#### Lab 11: DCI