COURSE LEVEL

Network Automation in the WAN (NA-WAN) is an advanced-level course.

INTENDED AUDIENCE

This course benefits individuals responsible for managing MPLS networks that want to add automation using the NorthStar Controller and NorthStar Planner, including individuals in professional services, sales and support organizations, and the end users.

PREREQUISITES

The following are the prerequisites for this course:

- Understanding of the OSI model;
- Junos OS configuration experience—the *Introduction to the Junos Operating System* (IJOS) course or equivalent; and
- Advanced MPLS knowledge—the *Junos MPLS Fundamentals* (JMF) course or equivalent.

COURSE NO

EDU-JUN-NA-WAN

LENGTH

4 DAYS

CONTACT INFORMATION

training@juniper.net

COURSE OVERVIEW

This four-day course is designed to introduce various Juniper NorthStar Controller and NorthStar Planner features including, but not limited to, topology discovery, Multiprotocol Label Switching (MPLS) label switched path (LSP) management, LSP optimization, LSP calendaring, maintenance scheduling, segment routing, troubleshooting, REST API, P2MP LSPs, failure simulation, reporting, network modeling, path demand placement, and hardware inventory. Students will learn to configure and monitor these features that exist on Juniper's NorthStar Controller and NorthStar Planner platforms with the help of a network built using vMX Series devices.

Through demonstrations and hands-on labs, students will gain experience configuring, monitoring, and analyzing the above features of the NorthStar Controller and Planner. This course is based on NorthStar Release 4.0.

OBJECTIVES

After successfully completing this course, you should be able to:

- Describe the various WAN domains.
- Describe the use cases for NorthStar.
- Describe the use cases for NorthStar Planner.
- Describe the usage of PCEP.
- Describe RSVP signaling using the CSPF algorithm.
- Describe the NorthStar VMs and their processes.
- Describe the post installation setup process.
- Describe the behavior of topology discovery.
- Describe the configuration of IGP topology discovery.
- Describe the configuration of BGP-LS topology discovery.
- Describe how to access the NorthStar Controller Operator and Planner user interfaces.
- Describe the basic features of the NorthStar Controller Operator user interface.
- Describe the various LSP types.
- Configure PCC controlled LSPs.
- Configure PCE delegated LSPs.
- Configure PCE initiated LSPs.
- Monitor LSPs from the NorthStar Operator user interface.
- Describe primary, secondary, and standby LSPs.
- Describe symmetric pairs of LSPs.
- Describe diversity groups.
- Describe using Junos MPLS LSP templates.
- Describe LSP calendaring.
- Describe Inter-AS LSPs.
- Describe how to provision multiple LSPs.
- Describe LSP optimization.
- Configure Segment Routing
- Manage NorthStar using the REST API
- Troubleshoot NorthStar Controller
- Create P2MP LSPs
- Explain the features, capabilities, and benefits of NorthStar Planner and how they work to optimize WAN design.
- Access NorthStar Planner and navigate and customize the NorthStar Planner administrative interface.
- Explain different methods of creating a network model.
- Manage different files that make up a network model and understand how these files are organized.
- Modify a network model by performing tasks such as adding links, nodes, and sites and save these changes to a modeled network.
- Optimize network demand paths, design diverse paths, and perform what-if scenarios to see how demands are routed.
- Simulate link and node failures and view the effects of these failures on demand routing across the WAN.
- Analyze and manage network information using the Report Manager interface.
- Perform hardware inventory using the NorthStar Planner interface.

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

1

© 2018 Juniper Networks, Inc.

COURSE CONTENT

Day 1

1	**COURSE INTRODUCTION**

2	**WAN Automation**

- The WAN Network
- Juniper Network WAN Automation Overview

3	**Northstar Controller Architecture**

- PCE Communication Protocol
- LSP Signaling and the CSPF Algorithm
- NorthStar Virtual Machines
- Initial Setup
- NorthStar Controller High Availability

LAB 1: Initial Setup

4	**Topology Discovery**

- Topology Discovery Overview
- IGP Topology Discovery
- BGP-LS Topology Discovery

LAB 2: Topology Discovery

Day 2

5	**Using the NorthStar Controller**

- Operator User Interface Overview
- User Options
- More Options
- View
- Planner User Interface Overview

LAB 3: Using the NorthStar Controller

6	**Basic LSP Management**

- LSP Control Review
- Configuring PCC Controlled LSPs
- Configuring PCE Delegated LSPs
- Configuring PCE Initiated LSPs
- Verifying LSP Status

LAB 4: Basic LSP Management

7	**Advanced LSP Management**

- Secondary and Standby LSPs
- Symmetric Pairs of LSPs
- Diversity Groups
- Junos MPLS LSP Templates
- LSP Calendaring
- Inter-AS LSPs
- Provisioning Multiple LSPs
- LSP Optimization

LAB 5: Advanced LSP Management

8	**Segment Routing**

- Segment Routing Overview
- Configuring a PCC to Support SR
- Managing SR LSPs

LAB 6: Segment Routing

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

2

© 2018 Juniper Networks, Inc.

Day 3

9

P2MP LSPs

- P2MP LSP Overview
- NorthStar P2MP Configuration and Management

10

Maintenance Scheduling and NETCONF Provisioning
- Maintenance Scheduling
- NETCONF Provisioning

Lab 7: Scheduling Maintenance and NETCONF Provisioning

11

Data Collection and Analytics

- Telemetry Architecture
- JTI Router Configuration
- LSP Routing Behavior

Lab 8: Data Collection and Analytics

12

NorthStar Controller Troubleshooting

- Process Troubleshooting
- Log File Analysis
- Network Topology Troubleshooting

Lab 9: NorthStar Controller Troubleshooting

13

REST API

- NorthStar Controller REST API Concepts
- REST API Examples

Day 4

14

NorthStar Planner

- Launching NorthStar Planner
- NorthStar Planner Interface

Lab 10: NorthStar Planner Interface

15

NorthStar Planner Path Analysis and Design

- Optimize LSP Routing
- Diverse LSP Design
- Adding Network Demands, Links, Nodes

Lab 11: NorthStar Planner Path Analysis and Design

16

Network Demand Placement and Outage Simulation
- Network Demand Placement
- Failure Simulation

Lab 12: Demand Placement and Failure Simulation

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

3

© 2018 Juniper Networks, Inc.