

# Advanced Junos Platform Automation and DevOps

## COURSE OVERVIEW

This four-day course introduces students to popular open-source applications that are used to manage Junos OS devices in DevOps environments. Through demonstrations and hands-on labs, students will gain experience managing Junos OS devices using Ansible, AWX, Jenkins, Robot Framework, and NITA. This course combines these popular open-source tools with DevOps principles and practices to demonstrate the automation capabilities of Junos OS devices. This course is based on Junos OS Release 22.1R1.10.

### COURSE LEVEL

Advanced

### AUDIENCE

- Individuals who want to use DevOps practices and principles to manage network devices
- Network engineers and operators who are responsible for managing Junos OS devices
- Network engineers and operators who are looking for open-source methods to deploy services
- Developers who support network operations
- Network integrators

### PREREQUISITES

- Basic understanding of the Junos OS
- General understanding of network concepts and devices
- Basic understanding of scripting and automation

### RELEVANT JUNIPER PRODUCT

- Juniper Apstra
- QFX Series

### OBJECTIVES

- Explain DevOps principles.
- Describe Infrastructure as Code.
- Describe the benefits of container applications.
- Create container images.
- Configure Docker networking.
- Deploy multi-container applications using Docker Compose.
- Describe Git.
- Create and manage a local Git repository.
- Create connections to remote repositories.
- Create and merge repository branches.
- Describe Ansible fundamentals.
- Create an Ansible DevOps environment.
- Use JSNAPy modules to verify the Junos OS device state.
- Create Ansible playbooks and roles for a Junos OS NOOB environment.
- Use NAPALM modules to manage Junos OS devices.
- Use Ansible to deploy Junos OS configuration.
- Navigate the AWX UI.
- Create AWX projects, inventory, and templates.
- Create an AWX workflow template.
- Use the AWX REST API.
- Describe the Robot Framework.
- Describe the Robot Framework project components.
- Create a Robot Framework test case for Junos OS devices.
- Create a custom Robot Framework library.
- Navigate the Jenkins user interface.
- Create Jenkins projects that integrate the Robot Framework plugin.
- Create Jenkins projects that integrate the Ansible plugin.
- Create Jenkins projects that integrate the Ansible Tower plugin.
- Create Jenkins pipelines using a Jenkinsfile.
- Explain NITA components.
- Perform NITA operations.
- Explain NITA customer use cases.
- Explain the benefits of CI/CD.
- Create a CI/CD environment.

## CONTACT YOUR REGIONAL EDUCATION SERVICES TEAM:

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## COURSE CONTENTS

### DAY 1

1	<b>Course Introduction</b>
2	<b>Introduction to DevOps</b> <ul style="list-style-type: none"> <li>Explain DevOps principles</li> <li>Describe infrastructure as code</li> </ul>
3	<b>Using Docker for DevOps</b> <ul style="list-style-type: none"> <li>Describe the benefits of container applications</li> <li>Create container images</li> <li>Configure Docker networking</li> <li>Deploy multi-container applications using Docker Compose</li> </ul> <b>Lab 1: Using Docker for DevOps</b>

### DAY 2

4	<b>Using Git</b> <ul style="list-style-type: none"> <li>Describe Git</li> <li>Create and manage a local Git repository</li> <li>Create connections to remote repositories</li> <li>Create and merge repository branches</li> </ul> <b>Lab 2: Using Git</b>
5	<b>Ansible Fundamentals</b> <ul style="list-style-type: none"> <li>Describe Ansible fundamentals</li> <li>Create an Ansible DevOps environment</li> </ul> <b>Lab 3: Ansible Fundamentals</b>
6	<b>Automating Junos OS Devices Using Ansible</b> <ul style="list-style-type: none"> <li>Use JSNAPy modules to verify the Junos OS device state</li> <li>Create Ansible playbooks and roles for a Junos OS NOOB environment</li> <li>Use NAPALM modules to manage Junos OS devices</li> <li>Use Ansible to deploy Junos OS configuration</li> </ul> <b>Lab 4: Automating Junos OS Devices Using Ansible</b>

### DAY 3

7	<b>Automating Junos OS Devices Using AWX</b> <ul style="list-style-type: none"> <li>Navigate the AWX UI</li> <li>Create AWX projects, inventory, and templates</li> <li>Create an AWX workflow template</li> <li>Use the AWX REST API</li> </ul> <b>Lab 5: Automating Junos OS Devices Using AWX</b>
8	<b>Testing Junos OS Devices Using the Robot Framework</b> <ul style="list-style-type: none"> <li>Describe the Robot Framework</li> <li>Describe the Robot Framework project components</li> <li>Create a Robot Framework test case for Junos OS devices</li> <li>Create a custom Robot Framework library</li> </ul> <b>Lab 6: Testing Junos OS Devices Using the Robot Framework</b>
9	<b>Automating Junos OS Devices Using Jenkins</b> <ul style="list-style-type: none"> <li>Navigate the Jenkins user interface</li> <li>Create Jenkins projects that integrate the Robot Framework plugin</li> <li>Create Jenkins projects that integrate the Ansible plugin</li> <li>Create Jenkins projects that integrate the Ansible Tower plugin</li> <li>Create Jenkins pipelines using a Jenkinsfile</li> </ul> <b>Lab 7: Automating Junos OS Devices Using Jenkins</b>

### DAY 4

10	<b>Automating Junos OS Devices Using NITA</b> <ul style="list-style-type: none"> <li>Explain NITA components</li> <li>Perform NITA operations</li> <li>Explain NITA customer use cases</li> </ul> <b>Lab 8: Automating Junos OS Devices Using NITA</b>
11	<b>Continuous Integration and Continuous Delivery</b> <ul style="list-style-type: none"> <li>Explain the benefits of CI/CD</li> <li>Create a CI/CD environment</li> </ul> <b>Lab 9: Continuous Integration and Continuous Delivery</b>
A	<b>Appendix: Kubernetes Overview</b> <ul style="list-style-type: none"> <li>Describe Kubernetes fundamentals</li> <li>Describe the Kubernetes Objects</li> <li>Describe Kubernetes networking</li> <li>Explore connecting applications with services</li> </ul>

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