

# Implementing Cisco Crosswork Network Controller (SPCNCI) v1.0

## What you'll learn in this course

The **Implementing Cisco Crosswork Network Controller (SPCNCI) v1.0** course introduces you to the Cisco® Crosswork Network Controller (CNC) and its installation. Through a series of lectures and labs you will learn to use Cisco CNC to streamline, manage, and automate service lifecycle functions spanning across service provisioning, visualization, monitoring, and optimization. You will also get an overview of Cisco CNC as an IP transport network controller platform, of its components, and of its utility in various use-cases such as boosting operational agility, improving intent-based service delivery, and reducing the cost of operations.

This course will also teach you about creating custom service definitions, tactical traffic engineering policies, automated provisioning of services, and real-time traffic optimization. Additionally, you will learn about implementing closed loop automation workflows for remediation, optimization, and maintenance. Finally, this course will teach you to understand APIs to help interface with other systems, as well as best practices, including sizing guidelines across components of the CNC meant to meet scalability and high-availability requirements.

## Course duration

- Instructor-led classroom: 4 days in the classroom with hands-on lab practice
- E-learning: Equivalent of 4 days of instruction and hands-on lab practice

## How you'll benefit

This course will help you:

- Deploy the CNC with associated component and applications
- Describe the advantages of CNC for service lifecycle functions
- Prepare to enable CNC to interface with other systems
- Understand the Cisco CNC as an IP transport network controller platform

## Who should enroll

- Network administrators
- Network operators
- Network architects
- System installers
- System integrators
- System administrators

## How to Enroll

### Instructor-led training

- Find a class at the [Cisco Learning Locator](#).
- Arrange training at your location through [Cisco Private Group Training](#).

### E-learning

- To buy a single e-learning license, visit the [Cisco Learning Network Store](#).
- For more than one license, or a learning library subscription, contact us at [learning-bdm@cisco.com](mailto:learning-bdm@cisco.com).

## Technology areas

- Networking
- Cisco CNC
- Network Automation

## Course details

### Objectives

After taking this course, you should be able to:

- Explain the advantages of CNC for service lifecycle functions
- Describe the architecture of the Cisco Crosswork Network Controller and its components
- Describe the main operations features and capabilities of CNC
- Perform the installation and initial configuration of the Cisco Crosswork Network Controller
- Onboard network devices in CNC
- Enable data collection in CNC using Crosswork Data Gateway
- Provision traffic engineering policies to be used by network services
- Explore network topology and inventory details by using the available visualizing tools
- Optimize a network service instance for bandwidth utilization during the lifetime of service instances
- Bind newly provisioned Layer 2 and Layer 3 VPN service instances to traffic engineering policies
- Develop custom Layer 2 and Layer 3 Multiprotocol Label Switching (MPLS) VPN service definitions
- Configure Key Performance Indicators (KPIs) to monitor the health of devices
- Develop plays and playbooks for closed loop automation
- Automate network operations and maintenance tasks
- Explore closed loop workflows
- Use northbound application programming interfaces to integrate other systems with CNC
- Send alerts to northbound systems
- Configure the collection and exporting of data to external endpoints
- Manage the Crosswork cluster
- Deploy CNC for optimal availability, scalability, and performance
- Troubleshoot CNC issues

## Prerequisites

To fully benefit from this course, you should have the following knowledge and skills:

- Basic management of network components (routers, switches, etc.)
- Knowledge of segment routing and MPLS
- Working knowledge of traffic engineering
- Basic knowledge of the Cisco Command-Line Interface (CLI)
- Basic knowledge of programming (Python or any scripting language)
- Basic knowledge of the NETCONF communication protocol and Yet Another Next Generation (YANG) data modeling
- Basic knowledge of XML, YAML, or JavaScript Object Notation (JSON) data structures and schemas

These are the recommended Cisco offerings that may help you meet these prerequisites:

- **Implementing and Administering Cisco Solutions (CCNA®)**
- **Implementing and Operating Cisco Service Provider Network Core Technologies (SPCOR)**
- **Implementing Cisco Service Provider VPN Services (SPVI)**
- **Implementing Automation for Cisco Service Provider Solutions (SPAUI)**
- **Implementing Cisco Service Provider Advanced Routing Solutions (SPRI)**

## Outline

- Introducing Cisco CNC
- Exploring Cisco CNC Architecture
- Describing Cisco CNC Unified Functions
- Installing and Configuring Cisco CNC
- Onboarding Network Devices
- Setting Up Data Collection
- Provisioning Traffic Engineering Policies
- Visualizing and Exploring Network Topology and Inventory Details
- Optimizing Networks Using Closed-Loop Automation
- Orchestrating VPN Services
- Developing Custom L2VPN and L3VPN Service Definitions
- Configuring KPIs to Monitor Device Health
- Automating Maintenance and Closed Loop Remediation
- Automating Network Maintenance Tasks
- Exploring Closed Loop Workflows
- Exploring Northbound APIs for External System Integration
- Managing System Alerts
- Collecting and Exporting Data to External Endpoints
- Operating a Cisco Crosswork Cluster
- Implementing CNC for High Availability, Scalability, and Performance
- Troubleshooting Cisco CNC

## Lab Outline

- Install Cisco CNC
- Use Device Life Cycle Manager to Onboard Devices
- Provision Data Gateways
- Provision Segment Routing for Traffic Engineering (SR-TE) Policies
- Customize View
- Enable Local Congestion Mitigation
- Provision VPN Services
- Extend an Existing VPN Service
- Create New KPI Profiles with Custom Alerting Logic and Forward Alerts via Northbound Interface (NBI)
- Develop Custom Plays and Playbooks
- Implement a Closed Loop Workflow
- Use Postman with Cisco CNC API
- Export Alerts to an External System
- Troubleshoot System Health Issues


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