



## Overview

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## Audience

This guide is for experienced network users and operators who want to use Cisco Crosswork infrastructure and applications in their network. This guide assumes that you are familiar with the following:

- Deploying OVF templates using VMware vCenter
- Deploying using OVF tool
- Using a Docker container
- Deploying a virtual machine on Cisco Cloud Services Platform (CSP)

## Introduction

Cisco Crosswork Infrastructure is a microservices-based platform that brings together streaming telemetry and model-driven application programming interfaces (APIs) to redefine service provider network operations. It retrieves real-time information from the network, analyzes the data, and provides both template-driven and automated tools to apply changes to the network. It employs a cluster architecture to be extensible, scalable, and highly available.



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**Note** Henceforth, Cisco Crosswork Infrastructure is referred to as "Cisco Crosswork" in the guide.

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Cisco Crosswork uses Cisco Crosswork Data Gateway, a software package that is separated out into its own Virtual Machine (VM), to gather information from the managed devices and forwards it to the Crosswork applications for analysis and processing. You can then use Crosswork applications to manage the network or respond to changes in the network. Crosswork Data Gateway can also be configured to collect data from network devices and forward that data to non-Crosswork users and applications. The number of Crosswork

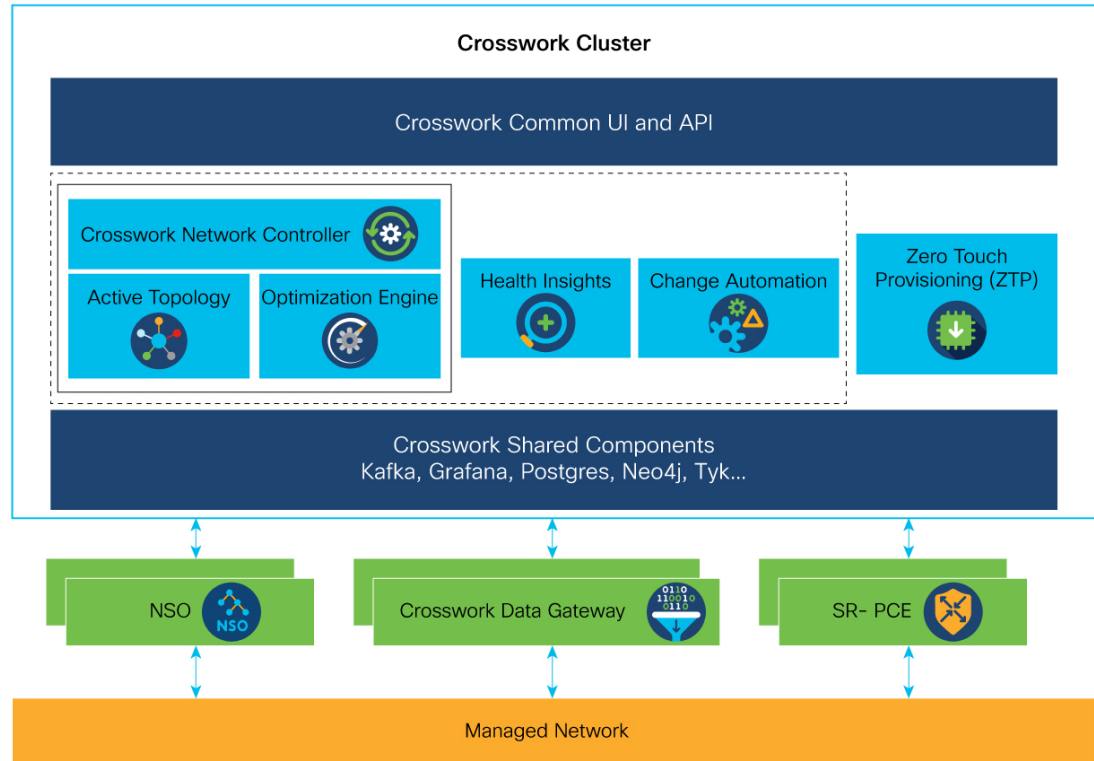
Data Gateways deployed in your network depends on the number of devices, the amount of data being collected, and the overall topology. Work with Cisco Customer Experience team to scale your deployment to best meet your needs.

This guide explains the requirements and installation process to set up the Cisco Crosswork along with the CDG(s). It also explains the requirements of other components that integrate with Cisco Crosswork such as Cisco NSO and the managed devices that make up your network. Details for installation of compatible software on other devices or applications are provided in documentation specific to those devices or applications.

Cisco Network Services Orchestrator (Cisco NSO) functions as the default provider for Crosswork to configure the devices according to their expected functions, including configuring model-driven telemetry (MDT) sensor paths, if any, for data collection. Cisco NSO is vital in supplying device management and configuration-maintenance services.

Cisco WAN Automation Engine (Cisco WAE) providers supply traffic and topology analysis to Cisco Crosswork. The foundation software is Cisco WAE Planning, which provides a cross-sectional view of traffic, topology, and equipment state.

**Figure 1: Cisco Crosswork Cluster Architecture**



Starting with the 4.0 release, the Cisco Crosswork Platform has adopted a cluster architecture, where the platform services are arranged in a unified cluster. In order to improve resource utilization and provide more resiliency, the design consists of a single cluster instance for all the infrastructure services, such as Kafka, NATS, alerting, topology etc. The Crosswork cluster for 4.0 release consists of at least 3 VMs operating in a hybrid configuration. Additional worker nodes can be added, as needed, to match the requirements of your network. A hybrid node can run infrastructure and application pods, while a worker node can only run the application pods.

# Cisco Crosswork Portfolio

Cisco Crosswork supports the following applications:

- **Cisco Crosswork Change Automation and Health Insights:** Cisco Crosswork Change Automation and Health Insights enables service providers to quickly deploy intent-driven, closed-loop operations. It provides a ready-to-use solution to automate change-impact and remediation, monitor KPIs, notify user of any anomalies, and prepare network changes triggered by KPI changes.
- **Cisco Crosswork Optimization Engine:** Cisco Crosswork Optimization Engine provides real-time network optimization allowing operators to effectively maximize network capacity utilization, as well as increase service velocity. Leveraging real-time protocols, such as BGP-LS and Path Computation Element Communication Protocol (PCEP), SR-PCE and Cisco Crosswork Optimization Engine enable closed-loop tracking of the network state, reacting quickly to changes in network conditions to support a self-healing network.
- **Cisco Crosswork Zero Touch Provisioning:** The Cisco Crosswork Zero Touch Provisioning (ZTP) application allows users to quickly and easily bring up devices using a Cisco-certified software image and a day-zero software configuration of the customer's choice. Once provisioned in this way, the new device is onboarded to the Crosswork device inventory (and, if it is configured to Cisco NSO), where it can be monitored and managed like other devices.

Cisco Crosswork supports Cisco Crosswork Network Controller, an integrated solution combining essential components such as Cisco Network Services Orchestrator, Segment Routing Path Computation Element (SR-PCE), Cisco Crosswork Active Topology, and Cisco Crosswork Optimization Engine. The solution enables you to proactively manage your end-to-end networks and provides intent-based and closed-loop automation solutions to ensure faster innovation, good user experience, and operational excellence. Cisco Crosswork Network Controller can also optionally integrate with Cisco Crosswork Change Automation and Health Insights and Cisco Crosswork Zero Touch Provisioning.

- Cisco Crosswork Active Topology (part of Cisco Crosswork Network Controller) enables visualization of topology and services on logical and geographical maps.

**Table 1: Supported Crosswork product versions**

Product	Version
Crosswork Data Gateway (CDG)	2.0
Crosswork Network Change Automation (NCA)	4.0
Crosswork Health Insights (HI)	4.0
Crosswork Optimization Engine (COE)	2.0
Crosswork Zero Touch Provisioning (ZTP)	2.0
Crosswork Network Controller (CNC)	2.0

**Table 2: Supported Cisco NSO and NED versions**

<b>Software/Driver</b>	<b>Version</b>
Cisco Network Services Orchestrator (Cisco NSO)	<ul style="list-style-type: none"><li>• 5.4.2</li></ul>
Cisco Network Element Driver (NED)	Cisco IOS XR: <ul style="list-style-type: none"><li>• CLI: 7.33, 7.33.1</li><li>• NETCONF: 6.6, 6.6.3, 7.3, 7.3.1</li></ul> Cisco IOS: <ul style="list-style-type: none"><li>• CLI: 6.67, 6.67.8</li></ul>

For more information, see [Cisco NSO and NED Requirements](#) and [Crosswork Portfolio Dependency matrix](#).