Overview

This chapter contains the following topics:

About this guide

This guide explains the requirements and processes to install or upgrade Crosswork Network Controller solution.

This document does not cover the installation of integrated components (such as Cisco NSO, Cisco SR-PCE, or Cisco WAE) that may already be installed or can be used independently. For more details about these components, please refer to their respective installation documentation.

Note While this guide includes instructions for installing or upgrading Crosswork Network Controller on Amazon EC2 platform, it is only available as a limited-release feature. Please contact your Cisco representative for assistance.

Audience

This guide is for experienced network users and operators who want to install Crosswork Network Controller solution in their network. This guide assumes that you are familiar with the following:

- Using a Docker container

- Running scripts in Python

- Deploying OVF templates using VMware vCenter

- Deploying using OVF tool

- Amazon Web Services (AWS), Amazon EC2 concepts, and creation of CloudFormation templates

Introduction

Cisco Crosswork Network Controller

Cisco Crosswork Network Controller is an integrated solution (consisting of Cisco Crosswork Infrastructure, Cisco Crosswork Data Gateway and the Crosswork applications) that enables you to proactively manage your end-to-end networks, by providing intent-based and closed-loop automation solutions to ensure faster innovation, optimal user experience, and operational excellence.

Cisco Crosswork Infrastructure

Cisco Crosswork Infrastructure is a microservices-based platform and is the foundation required for running Crosswork applications. It employs a cluster architecture to be extensible, scalable, and highly available. The Crosswork cluster consists of three VMs or nodes operating in a hybrid configuration. Additional VMs or nodes (maximum up to 2 nodes) in a Worker configuration can be added, as needed, to match the requirements of the deployed applications. A Hybrid node can run infrastructure and application pods, while a Worker node can run only application pods. The total number of Hybrid and Worker nodes varies based on the size of the network and the applications being run. Please work with the Cisco Customer Experience team to determine the number of nodes required for your network.

Note   Hereafter in this guide, Cisco Crosswork Infrastructure is referred to as "Cisco Crosswork".

Cisco Crosswork Data Gateway

Cisco Crosswork integrates with one or more Cisco Crosswork Data Gateway(s) to gather information from the managed devices and forward it to Cisco Crosswork as well as external destinations. The information is then analyzed and processed by the Crosswork applications and used to manage the network or respond to changes in the network. The number of Crosswork Data Gateways deployed in your network depends on the number of devices, the amount of data being collected, the overall topology, and your redundancy requirements. Each Crosswork Data Gateway is deployed on an individual VM. Please consult with the Cisco Customer Experience team for guidance on your deployment to best meet your needs.

Crosswork Data Gateway is an integral part of the Crosswork solution being deployed. For this reason, this document explains Crosswork Data Gateway as a foundational component that must be installed in tandem with the Crosswork Infrastructure.

Crosswork Applications

See Cisco Crosswork Network Controller Packages, on page 3 for details.

Other Integrated Components

Cisco Network Services Orchestrator functions as the provider for Cisco Crosswork to configure the devices according to their expected functions, including optionally configuring MDT sensor paths for data collection. Cisco NSO provides the important functions of device management, configuration and maintenance services.

Cisco Segment Routing Path Computation Element (SR-PCE) is an IOS-XR multi-domain stateful PCE supporting both Segment Routing Traffic Engineering (ST-TE) and Resource Reservation Protocol Traffic

Engineering (RSVP-TE). Cisco Crosswork uses the combination of telemetry and data collected from the Cisco SR-PCE to analyze and compute optimal paths for TE tunnels and/or to discover devices in the network.

Cisco Crosswork can also integrate with other providers (such as Cisco WAE, Syslog, and Alert), external servers (TACACS+, LDAP, and RADIUS), DHCP server (when using Crosswork ZTP), and external Kafka (for external data collection destinations). The details about these specific integrations are addressed in *Cisco Crosswork Network Controller 5.0 Administration Guide* or in the application guides.

Cisco Crosswork Network Controller Packages

The following table describes the Crosswork applications that can be deployed on the Crosswork Network Controller and the way they are packaged:

Note Cisco Crosswork Optimization Engine can be installed independently without any of the other Crosswork Network Controller applications. For more details, see Install Crosswork Applications.

Table 1: Cisco Crosswork Network Controller Packages

Package	Contents	Description
Essentials Package	Cisco Crosswork Optimization Engine	An application that provides closed-loop tracking of the network state and real-time network optimization in response to changes in network state, allowing operators to effectively maximize network capacity utilization, as well as increase service velocity.
	Cisco Crosswork Active Topology	A component of Crosswork Network Controller that enables visualization of topology and services on logical and geographical maps.
	Element Management Functions	A library of functions that provides deep inventory collection, alarm management and image management using Inventory, Fault, and Software Image Management (SWIM) functions.
Advantage Package	Cisco Crosswork Service Health	An application that overlays a service level view of the environment and makes it easier for operators to monitor if services (for example, L2/L3 VPN) are healthy based on the rules established by the operator.

Package	Contents	Description
Add-on Package	Cisco Crosswork Change Automation	An application that automates the process of deploying changes to the network. Orchestration is defined via an embedded Ansible Playbook and then configuration changes are pushed to Cisco Network Services Orchestrator (NSO) to be deployed to the network.
	Cisco Crosswork Health Insights	An application that performs real-time Key Performance Indicator (KPI) monitoring, alerting, and troubleshooting. Cisco Crosswork Health Insights enables programmable monitoring and analytics, and builds dynamic detection and analytics modules that allow operators to monitor and alert on network events based on user-defined logic.
	Cisco Crosswork Zero Touch Provisioning	An application that streamlines onboarding and provisioning of Day 0 configuration resulting in faster deployment of IOS-XR devices at a lower operating cost.

Security

Cisco takes great strides to ensure that all our products conform to the latest industry recommendations. We firmly believe that security is an end-to-end commitment and are here to help secure your entire environment. Please work with your Cisco account team to review the security profile of your network.

For details on how we validate our products, see Cisco Secure Products and Solutions and Cisco Security Advisories.

If you have questions or concerns regarding the security of any Cisco products, please open a case with the Cisco Customer Experience team and include details about the tool being used and any vulnerabilities it reports.