Overview

This chapter describes the system management features that you can use to monitor and manage Cisco NX-OS devices.

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Software Image

The Cisco NX-OS software consists of one NXOS software image.

Licensing Requirements

See the Cisco NX-OS Licensing Guide and Cisco NX-OS Licensing Options Guide for Cisco NX-OS licensing recommendations and instructions to obtain and apply licenses.

Cisco NX-OS Device Configuration Methods

Cisco NX-OS device configuration methods are the approaches available to configure network devices, either directly or through management services.

- Direct network configuration using CLI via SSH, Telnet, or console port.
- Configuration through Cisco DCNM client.

Available Configuration Methods and References

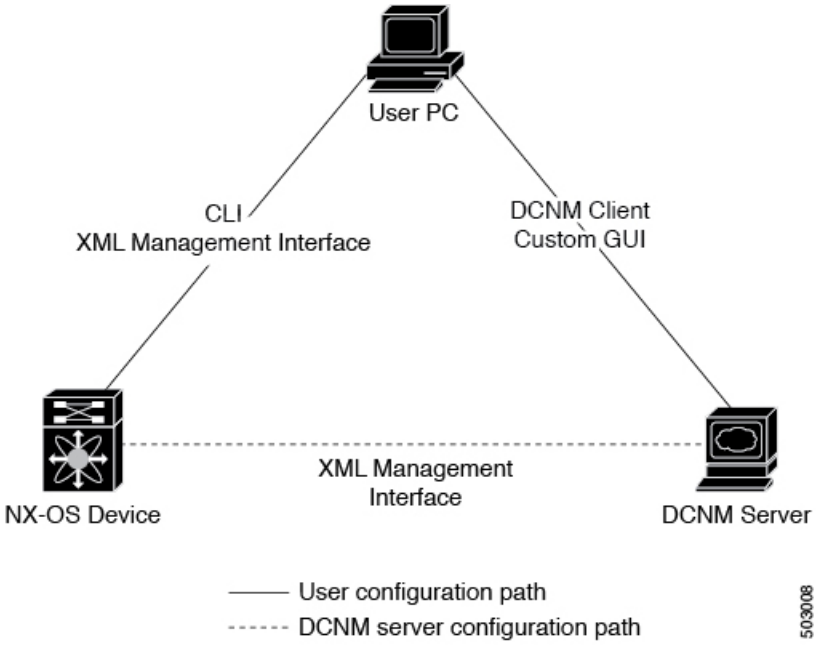
This section lists the configuration methods and the documents where you can find more information.

Table 1: Configuration Methods Book Links

Configuration Method	Document
CLI from a Secure Shell (SSH) session, a Telnet session, or the console port	Cisco Nexus 3400 Series NX-OS Fundamentals Configuration Guide
Cisco DCNM client	*Cisco DCNM Fundamentals Guide*

This figure shows the device configuration methods available to a network user.

Figure 1: Cisco NX-OS Device Configuration Methods



Configure with CLI or XML Management Interface

You can configure Cisco NX-OS devices using the command-line interface (CLI) or the XML management interface over Secure Shell (SSH) as follows:

- CLI from an SSH session, a Telnet session, or the console port—You can configure devices using the CLI from an SSH session, a Telnet session, or the console port. SSH provides a secure connection to the device. For more information, see the Cisco Nexus 9000 Series NX-OS Fundamentals Configuration Guide.
- XML management interface over SSH—You can configure devices using the XML management interface, which is a programmatic method based on the NETCONF protocol that complements the CLI functionality. For more information, see the *Cisco NX-OS XML Management Interface User Guide*.

Configure with Cisco DCNM

You can configure Cisco NX-OS devices using the Cisco DCNM client, which runs on your local PC and uses web services on the Cisco DCNM server. The Cisco DCNM server configures the device over the XML management interface. For more information about the Cisco DCNM client, see the Cisco DCNM Fundamentals Guide.

Configuring with CLI or XML Management Interface

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Configuring with Cisco DCNM

You can configure Cisco NX-OS devices using the Cisco DCNM client, which runs on your local PC and uses web services on the Cisco DCNM server. The Cisco DCNM server configures the device over the XML management interface. For more information about the Cisco DCNM client, see the Cisco DCNM Fundamentals Guide.

Network Time Protocol

The Network Time Protocol (NTP) synchronizes the time of day among a set of distributed time servers and clients so that you can correlate time-specific information, such as system logs, received from the devices in your network.

Cisco Discovery Protocol

You can use the Cisco Discovery Protocol (CDP) to discover and view information about all Cisco equipment that is directly attached to your device. CDP runs on all Cisco-manufactured equipment including routers, bridges, access and communication servers, and switches. CDP is media and protocol independent, and gathers the protocol addresses of neighboring devices, discovering the platform of those devices. CDP runs over the data link layer only. Two systems that support different Layer 3 protocols can learn about each other.

System Messages

You can use system message logging to control the destination and to filter the severity level of messages that system processes generate. You can configure logging to a terminal session, a log file, and syslog servers on remote systems.

For more information about the system message format and the messages that the device generates, see the *Cisco NX-OS System Messages Reference*.

Smart Call Home

Call Home provides an e-mail-based notification of critical system policies. Cisco NX-OS provides a range of message formats for optimal compatibility with pager services, standard e-mail, or XML-based automated parsing applications. You can use this feature to page a network support engineer, e-mail a Network Operations

Center, or use Cisco Smart Call Home services to automatically generate a case with the Technical Assistance Center.

Rollback

The rollback feature allows you to take a snapshot, or checkpoint, of the device configuration and then reapply that configuration at any point without having to reload. Rollback allows any authorized administrator to apply this checkpoint configuration without requiring expert knowledge of the features configured in the checkpoint.

Session Manager allows you to create a configuration session and apply all commands within that session atomically.

Session Manager

Session Manager allows you to create a configuration and apply it in batch mode after the configuration is reviewed and verified for accuracy and completeness.

Scheduler

The scheduler allows you to create and manage jobs such as routinely backing up data or making quality of service (QoS) policy changes. The scheduler can start a job according to your needs—only once at a specified time or at periodic intervals.

SNMP

The Simple Network Management Protocol (SNMP) is an application-layer protocol that provides a message format for communication between SNMP managers and agents. SNMP provides a standardized framework and a common language used for the monitoring and management of devices in a network.

RMON

Remote monitoring (RMON) is an Internet Engineering Task Force (IETF) standard monitoring specification that allows various network agents and console systems to exchange network monitoring data. Cisco NX-OS supports RMON alarms, events, and logs to monitor Cisco NX-OS devices.

Online Diagnostics

Cisco Generic Online Diagnostics (GOLD) define a common framework for diagnostic operations across Cisco platforms. The online diagnostic framework specifies the platform-independent fault-detection architecture for centralized and distributed systems, including the common diagnostics CLI and the platform-independent fault-detection procedures for boot-up and run-time diagnostics. The platform-specific diagnostics provide

hardware-specific fault-detection tests and allow you to take appropriate corrective action in response to diagnostic test results.

Embedded Event Manager

The Embedded Event Manager (EEM) allows you to detect and handle critical events in the system. EEM provides event detection and recovery, including monitoring of events either as they occur or as thresholds are crossed.

Onboard Failure Logging

You can configure a device to log failure data to persistent storage, which you can retrieve and display for analysis at a later time. This on-board failure logging (OBFL) feature stores failure and environmental information in nonvolatile memory on the module. This information is useful for analysis of failed modules.

SPAN

You can configure an Ethernet Switched Port Analyzer (SPAN) to monitor traffic in and out of your device. The SPAN features allow you to duplicate packets from source ports to destination ports.

ERSPAN

Encapsulated Remote Switched Port Analyzer (ERSPAN) is used to transport mirrored traffic in an IP network. ERSPAN supports source ports, source VLANs, and destinations on different switches, which provide remote monitoring of multiple switches across your network.

To configure an ERSPAN source session, you associate a set of source ports or VLANs with a destination IP address, ERSPAN ID number, and virtual routing and forwarding (VRF) name.

LLDP

Link Layer Discovery Protocol (LLDP) is a vendor-neutral, one-way device discovery protocol that allows network devices to advertise information about themselves to other devices on the network. This protocol runs over the data-link layer, which allows two systems running different network layer protocols to learn about each other. You can enable LLDP globally or per interface.

SMUs

A software maintenance upgrade (SMU) is a package file that contains fixes for a specific defect. SMUs are created to respond to immediate issues and do not include new features. SMUs are not an alternative to maintenance releases. They provide a quick resolution of immediate issues. All defects fixed by SMUs are integrated into the maintenance releases.

Virtual Device Contexts

Cisco NX-OS can segment operating system and hardware resources into virtual device contexts (VDCs) that emulate virtual devices. The Cisco Nexus 9000 Series switches currently do not support multiple VDCs. All switch resources are managed in the default VDC.

Troubleshooting Features

Cisco NX-OS provides troubleshooting tools such as ping, traceroute, Ethanalyzer, and the Blue Beacon feature.

When a service fails, the system generates information that can be used to determine the cause of the failure. The following sources of information are available:

- Every service restart generates a syslog message of level LOG_ERR.
- If the Smart Call Home service is enabled, every service restart generates a Smart Call Home event.
- If SNMP traps are enabled, the SNMP agent sends a trap when a service is restarted.
- When a service failure occurs on a local module, you can view a log of the event by entering the **show processes log** command in that module. The process logs are persistent across supervisor switchovers and resets.
- When a service fails, a system core image file is generated. You can view recent core images by entering the **show cores** command on the active supervisor. Core files are not persistent across supervisor switchovers and resets, but you can configure the system to export core files to an external server using the file transfer utility Trivial File Transfer Protocol (TFTP) by entering the **system cores** command.
- CISCO-SYSTEM-MIB contains a table for cores (cseSwCoresTable).