Cisco IOS XR Software Release 6.0 Operational Enhancements

Product Overview

Cisco helps service providers capture the digitization opportunity with cloud-scale software and hardware innovations that deliver unprecedented automation, visibility, control, and software modularity.

In Cisco IOS® XR Software Release 6.0, we are evolving the networking operating system specifically to help customers move and innovate faster. While retaining its breadth of protocol spectrum and feature set, Cisco IOS XR Software has now evolved to meet next-generation operational requirements.

As customer organizations have grown over the past decade, they've sought a flexible operating system that can keep up. The new innovations in Cisco IOS XR Software Release 6.0 enable incremental builds, agile workflow, and modular delivery of software, while also offering the capability to host third-party applications on Cisco® routers.

Features and Benefits

Table 1 lists the main features and benefits of the new software release.

Table 1.   Cisco IOS XR Software Release 6.0 Main Features and Benefits

Benefit	Feature
Fully automated initial installation	• Bootable ISO: To simplify installation, Cisco IOS XR 6.0 images are in the form of a bootable ISO that's installed on the system. The software also supports iPXE, which allows the administrator to boot from TFTP, HTTP, or FTP. • Autoprovisioning: Autoprovisioning starts at the end of the software's container boot process and serves two functions: static configuration application and script execution. It allows administrators to customize settings easily and automatically, without wasting time on manual configuration.
Visibility for smarter control, simpler monitoring, and faster troubleshooting	• Streaming telemetry: Users can take advantage of streaming telemetry to direct data to a configured receiver. Data can be pushed out at intervals determined by the administrator, at a cadence as low as 30 seconds. Using sophisticated algorithms, a back-end server can then analyze data received from Cisco IOS XR 6.0. The data can be encoded in JavaScript Object Notation (JSON) or Google Protocol Buffers (GPB). This analysis enables back-end management systems to measure and even predict control-plane and data-plane trends. • Machine-to-machine (M2M) interfaces: Prior to Release 6.0, administrators relied on Simple Network Management Protocol (SNMP) and syslog—techniques that are neither scalable nor easily automated. With this latest release of Cisco IOS XR, administrators can more easily work together using the internal system database (SysDB). SysDB is not a database in a strict sense, but rather a tree-like file system that can provide a common mechanism for management clients to modify or access system information. SysDB stores a variety of types of data, including integers of different sizes, character strings, and externally managed data items.
Flexible design for agile maintenance and updates	• Application hosting: The Cisco IOS XR 6.0 architecture supports third-party off-the-shelf applications built with Linux tool chains. Users can run custom applications built with the software development kit (SDK) that Cisco provides. Application hosting gives administrators a platform for experimenting with their own tools and utilities. • Flexible packaging and provisioning: The Release 6.0 architecture facilitates modular software delivery of individual components, which increases operational agility and efficiency. Modular delivery of software also eases difficulties during routine upgrades and maintenance fixes, promoting flexible, asynchronous upgrades.
Open architecture	• Linux-based OS: Release 6.0 opens up the architecture of Cisco IOS XR using a 64-bit Linux-based operating system. (It uses the Wind River 7 distribution, which is compatible with Yocto 1.5 and approved by the Yocto project.) In contrast to the traditional 32-bit QNX OS, Release 6.0 can easily integrate applications, configuration-management tools, and autoprovisioning. These attributes make it highly automatable and transparent to monitoring and management tools.

Benefit	Feature
High performance	• Lightweight containers: Release 6.0 uses Linux Containers (LXC) instead of a hypervisor. Unlike with traditional virtualization methods, containers reach near-native performance, because instead of emulating hardware, they take advantage of kernel name spaces to provide an isolated view of the system. Boot-up time is also greatly reduced, because a container can be activated in fractions of a second, whereas boot-up of a virtual machine takes considerably longer. The end result is very similar to a virtual machine but without the overhead of a hypervisor.

Supported Platforms

The following Cisco platforms support containerized 64-bit Cisco IOS XR Software Release 6.0:

- Cisco Network Convergence System (NCS) 5508
- Cisco NCS 5001
- Cisco NCS 5002
- Cisco NCS 1002

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