Managing Cisco UCS C-Series Rack Servers as Standalone Systems

Benefits

- Simplified remote management of standalone Cisco UCS® C-Series Rack Servers and E-Series Servers
- Advanced management capabilities, such as virtual (remote) keyboard, video, and mouse (KVM) with recorder and chat features; crash and boot capture; and RAID controller configuration
- Capability to integrate with third-party operations management tools as well as with Cisco® Integrated Management Controller (IMC) Supervisor
- Unified, standards-based management of physical and logical interfaces

Cisco UCS C-Series Rack Servers

Cisco UCS® C-Series Rack Servers extend unified computing innovations to a rack-mount form factor. They are the only servers that can be used either standalone or integrated as part of the Cisco Unified Computing System™ (Cisco UCS). When used as standalone servers, these systems can be managed through the Cisco® Integrated Management Controller (IMC): integrated management software that provides network-based access to every aspect of server management, from power state and firmware revisions to remote keyboard, video, and mouse (KVM) devices. IMC includes a HTML5 WebUI, including support for virtual KVM.

The flexibility to manage rack servers as standalone systems or as part of Cisco UCS makes Cisco UCS C-Series Rack Servers the preferred choice for many organizations. Organizations may also prefer Cisco UCS C-Series Rack Servers for their high I/O bandwidth, the large memory configurations they can support, and their high-capacity internal disk space.

Flexible, Standards-Based Standalone Server Management

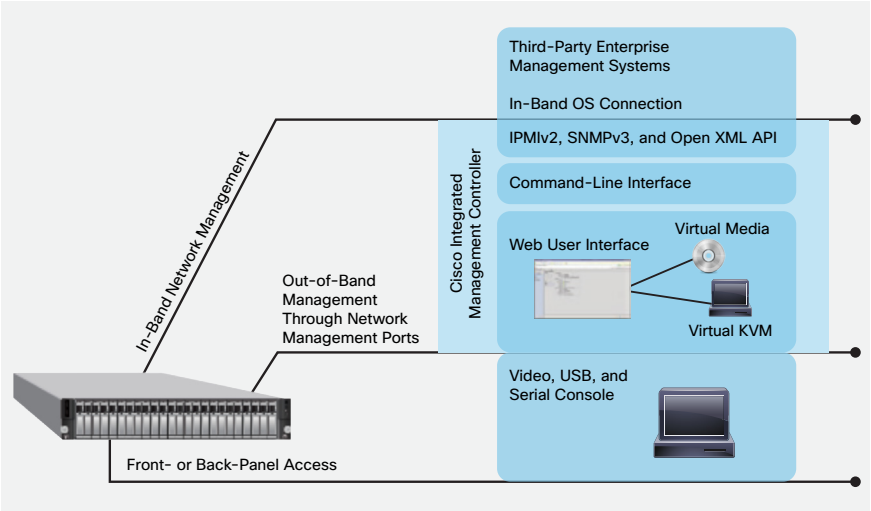
As standalone systems, Cisco UCS C-Series servers provide a flexible, standards-based set of management interfaces that enables organizations to take advantage of Cisco servers' innovative features in heterogeneous data centers. Cisco IMC provides administrators with the tools they need to control and manage servers, including remote KVM devices, power state, and firmware revisions. The IMC supports industry-standard protocols, including Redfish version 1.01, Intelligent Platform Monitoring Interface Version 2 (IPMI v2), and Simple Network Management Protocol versions 2 and 3 (SNMP v2 and v3). It also provides an open Extensible Markup Language (XML) API and a command-line interface (CLI).

Physical Management Interfaces

Cisco UCS C-Series servers provide up to three management interfaces that can be accessed by in-band or out-of-band tools and techniques (Figure 1):

- Ethernet network access to the IMC (web user interface [WebUI], CLI, and XML API)
- Agentless management with third-party tools through in-band data-plane connections
- Front- or back-panel access for video, USB (with the capability to boot from a USB CD/DVD drive), and serial console access

Figure 1. Manage Cisco UCS Rack Servers Through Physical and Logical Management Interfaces



Logical Management Interfaces

The IMC runs in the system's baseboard management controller (BMC) and can be accessed through the server network management ports. It provides out-of-band management that can be accessed through standard management protocols, CLIs, and web-based interfaces.

Redfish v1.01: Redfish is an open industry standard that specifies a representational state transfer (REST) interface based on the Open Data Protocol (OData), which uses HTTPS and JavaScript Object Notation (JSON) to transfer data. This standard was developed by the Distributed Management Task Force (DMTF) with the participation of many server vendors, including Cisco.

IPMI v2: Provides supports out-of-band management through third-party tools, including commercial enterprise management systems and open-source tools such as ipmitool. IPMI allows these tools to manage server power states and monitor operation parameters available through temperature, fan-speed, power-supply voltage, and power sensors.

SNMP v2 and v3: Supports out-of-band management with third-party tools, including network management tools that use SNMP to monitor system status variables and receive SNMP traps in the event that the status falls outside predetermined ranges.

Open XML API: The IMC supports an open XML API that enables third-party software to access all the system's features and capabilities discussed in the section "Cisco IMC Features and Capabilities" later in this document.

Command-Line Interface: The CLI can be accessed through a Secure Shell (SSH) connection to the IMC. Through this interface, administrators can perform server control and administration tasks, and they can script configuration tasks so that the tasks can be reproduced reliably on multiple servers without errors.

Web User Interface: Supports out-of-band management through a standard web browser. It includes server management, remote KVM, virtual media, and administration capabilities:

- Server management includes power management, server reset, component inventory, and event logging.
- Virtual media enables peripherals such as CD and DVD drives to appear as if they were connected directly to the server, facilitating remote OS and application software installation.
- Remote KVM capabilities give remote administrators the same level of control, including console video control, as when they are physically connected to the server.

Managing Through Enterprise Management Tools

Third-party management tools typically use a combination of in-band and out-of-band management techniques, both of which are supported by Cisco UCS C-Series servers.

- In-band management is performed through the server's data network connection. Different tools use different techniques, including interaction with the host operating system with and without the use of agents. In-band management can interact with OS-based management tools to accomplish tasks including inventory, performance management, troubleshooting, and OS and interface provisioning.
- Out-of-band management tools include the IMC Supervisor and the IMC software development kits (SDKs) for Microsoft PowerShell and Python. Third-party management tools are also supported. Nagios and Microsoft System Center use the IMC interfaces available through the network management port. These tools typically interact with servers through the XML API.

Cisco IMC Features and Capabilities

With the IMC, administrators can perform the following server management tasks with role-based access that is easily defined on a per-user basis:

- Implement virtual (Remote) KVM with recorder and chat features
- Crashes and Boot Capture
- RAID Controller configuration
- Manage server BIOS settings
- Configure the server boot order (including precision boot)
- Configure Cisco Virtual Interface Cards (VICs)
- Configure network-related settings, including network interface card (NIC) properties, IPv4, VLANs, and network security
- Configure communication services, including HTTP, SSH, and IPMI over LAN
- Create and manage local user accounts and connect to external authentication and authorization systems, including Lightweight Directory Access Protocol (LDAP) and Microsoft Active Directory
- Power on, power off, power cycle, reset, and shut down the server
- Toggle the locator LED
- View server properties and sensors
- Manage certificates
- Update system firmware
- Configure and send email fault notifications
- Monitor faults, alarms, and server status

For More Information

Please visit Cisco UCS C-Series Rack Servers and Cisco IMC Supervisor.

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