Cisco UCS C420 M3 Rack Server

Product Overview

The Cisco UCS® C420 M3 Rack Server (Figure 1) is a high-density, 4-socket, 2-rack-unit (2RU) rack server designed for computing, I/O, storage, and memory-intensive standalone applications. The Cisco UCS C420 M3 extends the capabilities of the Cisco Unified Computing System™ (Cisco UCS) using Intel Xeon processor E5-4600 Series multicore processors to deliver increased performance and efficiency.

The Cisco UCS C420 M3 is part of the Cisco UCS solution, which combines rack and blade servers with networking and storage access into a single unified system. Centrally configured through unified, model-based management, Cisco UCS simplifies and accelerates deployment of enterprise-class applications running in bare-metal, virtualized, and cloud-computing environments.

Designed for enterprise-class performance and scalability, the Cisco UCS C420 M3 combines the advantages of 4-socket computing with the cost-effective Intel Xeon processor E5-4600 product family for demanding virtualization, database, and high-end high-performance computing (HPC) workloads. The dense and expandable Cisco UCS C420 M3 is a balanced, high-performance platform that complements the Cisco UCS Rack Server portfolio. The 2RU Cisco UCS C420 M3 supports 48 DIMM slots, 16 disk drives, seven PCIe expansion slots, and four 1 Gigabit Ethernet LAN-on-motherboard (LOM) ports. It uses unique Cisco UCS and virtual interface card (VIC) technology and delivers one-wire participation in Cisco UCS domains. The Cisco UCS C420 M3 interfaces with Cisco UCS using another Cisco innovation: the Cisco UCS VIC 1225. The Cisco UCS VIC 1225 is a dual-port Enhanced Small Form-Factor Pluggable (SFP+) 10 Gigabit Ethernet and Fibre Channel over Ethernet (FCoE)-capable PCI Express (PCIe) card designed exclusively for Cisco UCS C-Series Rack Servers. It incorporates Cisco's next-generation converged network adapter (CNA), providing investment protection for feature releases. The card enables a policy-based, stateless, agile server infrastructure that can present up to 256 PCIe standards-compliant interfaces to the host that can be dynamically configured as either network interface cards (NICs) or host bus adapters (HBAs). In addition, the Cisco UCS VIC 1225 supports Cisco® Data Center Virtual Machine Fabric Extender (VM-FEX) technology, which extends the Cisco UCS fabric interconnect ports to virtual machines, simplifying server virtualization deployment.

Figure 1.   Cisco UCS C420 M3 Rack Server

Applications

The Cisco UCS C420 M3 Rack Server continues Cisco's commitment to delivering uniquely differentiated value, fabric integration, and ease of management that is exceptional in the marketplace for enterprise-class, storage-intensive applications:

- Collaboration
- Databases
- Virtualization and consolidation
- Enterprise resource planning (ERP) and customer resource management (CRM)
- High-end HPC

Cisco UCS Servers Change the Economics of the Data Center

IT infrastructure matters now more than ever, as organizations seek to achieve the full potential of infrastructure as a service (IaaS), bare metal, virtualized servers, and cloud computing. Cisco continues to lead in data center innovation with the introduction of new building blocks for Cisco UCS that extend its exceptional simplicity, agility, and efficiency (Figure 2), including innovations such as the Cisco UCS C420 M3 Rack Server.

Figure 2.   Cisco UCS Components
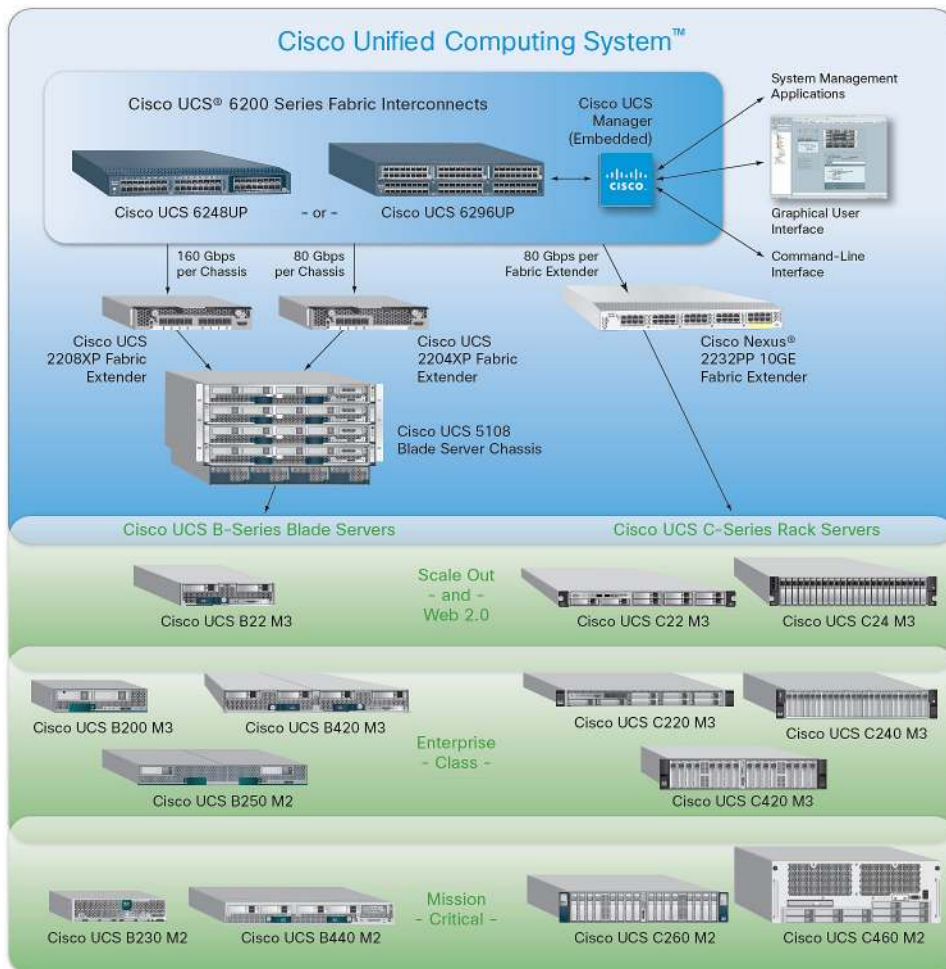
Cisco innovations, such as Cisco UCS Manager, allows administrators to create a software definition for a desired server (using Cisco service profiles and templates) and then instantiate that server and its I/O connectivity by associating a service profile with physical resources. This approach contrasts with the traditional method of configuring each system resource manually, one at a time, through individual element managers. Unlike with the products of other vendors, Cisco service profiles can be moved from rack server to rack or blade server, or between blade or rack servers in different chassis. In other words, Cisco UCS Manager and service profiles are form-factor agnostic. Other Cisco UCS building blocks include enhanced server I/O options and expanded Cisco UCS fabric interconnects that extend scalability and management simplicity for both blade and rack systems across bare-metal, virtualized, and cloud-computing environments. Cisco helps ensure that nearly all parts of Cisco UCS offer investment protection and are backward compatible. For example, fabric extenders can be upgraded using the same fabric interconnects and the same Cisco UCS VIC 1225. Fabric interconnect hardware can be upgraded independently of fabric extenders and blade chassis. Cisco continues to innovate in all these areas, helping ensure that both now and in the future, more powerful rack servers with larger, faster memory have adequate I/O bandwidth and computing power. Cisco completes this vision through continuous innovation in VIC, application-specific integrated circuit (ASIC), fabric extender, fabric interconnect, blade server, blade chassis, and rack-server technologies and in the form-factor-agnostic Cisco UCS Manager software that ties all these ever-advancing hardware pieces together.

The Cisco UCS C420 M3 is also part of a large family of rack servers: the Cisco C-Series Rack Servers. Designed to operate both in standalone environments and as part of Cisco UCS, the Cisco UCS C-Series servers employ Cisco technology to help customers handle the most challenging workloads. The Cisco UCS C-Series complements a standards-based unified network fabric with Cisco Data Center VM-FEX virtualization support, Cisco UCS Manager Software, Cisco fabric extender and fabric interconnect architectures, and Cisco Extended Memory Technology. Again, Cisco is innovating across all these technologies. With Cisco UCS architectural advantages, software advances, continuous innovation, and unique blade server and chassis designs, Cisco UCS is the first truly unified data center platform. In addition, Cisco UCS can transform IT departments through policy-based automation and deep integration with familiar systems management and orchestration tools.

Features and Benefits

The Cisco UCS C420 M3 has a built-in entry point to unified computing. Table 1 summarizes the features and benefits of the Cisco UCS C420 M3 Rack Server.

Table 1.   Features and Benefits

Feature	Benefit
10-Gbps unified network fabric	• Low-latency, lossless, 10-Gbps Ethernet and industry-standard FCoE and native Fibre Channel fabric • Wire-once deployment model in which changing I/O configurations no longer means installing adapters and recabling racks and switches • Fewer interface cards, cables, and upstream network ports to purchase, power, configure, and maintain
Virtualization optimization	• Cisco Data Center VM-FEX and Adapter FEX technologies, I/O virtualization, and Intel Xeon processor E5-4600 product family features, extending the network directly to virtual machines • Consistent and scalable operation model • Increased security and efficiency with reduced complexity
Unified management (when integrated into Cisco UCS)	• Entire solution managed as a single entity with Cisco UCS Manager, improving operation efficiency and flexibility • Service profiles and templates that implement role- and policy-based management, enabling more effective use of skilled server, network, and storage administrators • Automated provisioning and increased business agility, allowing data center managers to provision applications in minutes rather than days • Capability to move virtual machines and their security features and policies from rack to rack or rack to blade or blade to blade

Feature	Benefit
Intel Xeon processor E5-4600 product family	• Automated energy efficiency reduces energy costs by automatically putting the processor and memory in the lowest available power state while still delivering the performance required and flexible virtualization technology that optimizes performance for virtualized environments, including processor support for migration and direct I/O • Up to twice the performance for floating-point operations is offered through Intel Advanced Vector Extensions (AVX), which provides new instructions that can significantly improve performance for applications that rely on floating-point or vector computations • Cisco C-Series servers keep pace with Intel Xeon processor innovation by offering the latest processors, with increased processor frequency and improved security and availability features. With the increased performance provided by the Intel Xeon processor E5-4600 product family, Cisco UCS C-Series servers offer an improved price-to-performance ratio, making Cisco UCS servers among the best values in the industry • Advanced reliability features, including Machine Check Architecture Recovery, automatically monitor, report, and recover from hardware errors to maintain data integrity and keep mission-critical services online • Intel provides hardened protection for virtual and cloud environments. You can establish trusted pools of virtual resources with Intel Trusted Execution Technology (TXT). Intel TXT helps ensure that physical servers and hypervisors boot only into cryptographically verified known good states. It safeguards your business more effectively by protecting your platform from the insertion of malware during or prior to launch

High-capacity, flexible internal storage	• Up to 16 front-accessible, hot-swappable, SFF SAS, SATA, or SSD drives for local storage, providing redundancy options and ease of serviceability
	• Balanced performance and capacity to meet application needs:
	  ◦ SATA SSDs
	  ◦ 15,000-rpm SAS drives for highest performance
	  ◦ 10,000-rpm SAS drives for high performance and value
	  ◦ 7200-rpm SATA drives for high capacity and value

RAID 0, 1, 5, 6, 10, 50, and 60 support	A choice of RAID controllers to provide data protection for up to 16 SAS, SATA, or SSD drives in PCIe and mezzanine card form factors
Cisco UCS C-Series Integrated Management Controller (IMC)	• Web user interface for server management; remote keyboard, video, and mouse (KVM); virtual media; and administration • Virtual media support for remote CD and DVD drives as if local • Intelligent Platform Management Interface (IPMI) 2.0 support for out-of-band management through third-party enterprise management systems • Command-line interface (CLI) for server management
Fast-memory support	48 DIMM slots supporting up to 1600 MHz of memory for optimal performance
Redundant fans and power supplies	• Dual-redundant fans and power supplies for enterprise-class reliability and uptime • Power efficiency through Cisco Common Form-Factor Platinum Power Supplies (1200 watts [W])
7 PCIe 3.0 slots	• Flexibility, increased performance, and compatibility with industry standards • PCIe 3.0 slots, which are estimated to substantially increase the bandwidth over the previous generation of PCIe and offer more flexibility while maintaining compatibility with PCIe 2.0 • 2 full-height, half-length, x16 horizontal slots on riser cards • 5 half-height, half-length, x8 slots on the motherboard For more information, refer to the Cisco UCS C420 M3 Rack Server specifications sheet: http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html
Integrated quad-port Gigabit Ethernet	• Outstanding network I/O performance and increased network efficiency and flexibility • Increased network availability when configured in failover configurations
Trusted Platform Module (TPM)	• TPM is a chip (microcontroller) that can securely store artifacts used to authenticate the platform (server) • These artifacts can include passwords, certificates, and encryption keys • TPM can also be used to store platform measurements that help ensure that the platform remains trustworthy, helping ensure authentication and authorization
Tool-free access	Enhanced serviceability through tool-free access to all serviceable items, and color-coded indicators to guide users to hot-pluggable and serviceable items
Cisco Flexible Flash (FlexFlash)	• The server supports 1 internal Cisco FlexFlash drive (secure digital [SD] card) • The SD card is preloaded with 4 virtual drives, which contain the Cisco Server Configuration Utility, the Cisco Host Upgrade Utility, the Cisco C-Series server drivers, and a blank virtual drive on which you can install an OS or a hypervisor

Product Specifications

Table 2 lists the specifications for the Cisco UCS C420 M3 server.

Table 2.   Product Specifications

Item	Specification
Processors	• 2 or 4 Intel Xeon processor E5-4600 series processors • Processor choices listed in the Cisco UCS C420 M3 Rack Server specifications sheet: http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html
Memory	48 slots for registered DIMMs (RDIMM) and load-reduced DIMMs (LRDDIMMs)
Chipset	Intel Patsburg-A platform controller hub (PCH) chipset
PCIe expansion slots	7 PCIe expansion slots: • 2 full-height, half-length, x16 horizontal slots on riser cards • 5 half-height, half-length, x8 slots on the motherboard For more information, refer to the Cisco UCS C420 M3 Rack Server specifications sheet: http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html
RAID cards	Plug-in PCIe cards: • LSI MegaRAID 9271CV-8i with supercap for on-board 1-GB flash-backed write cache backup, supporting up to 16 internal drives and RAID levels 0, 1, 5, 6, 10, 50, and 60 • LSI MegaRAID 9286CV-8e with supercap for on-board 1-GB flash-backed write cache backup, supporting up to 8 external drives and RAID levels 0, 1, 5, 6, 10, 50, and 60
Internal storage devices	Disk drives • Drives are installed in configurable (1 or 2) drive bay modules that provide hot-pluggable front-panel access • Each drive bay module can hold up to eight 2.5 x 0.55 in. (63.5 x 14 mm) SAS or SATA hard disk drives (HDDs) or solid state drives (SSDs), for a total of 16 drives USB flash drive • An optional 4- or 8-GB USB drive is available • A 16-GB SD drive is available
Hard drives	Up to 16 front-accessible, hot-swappable, 2.5-inch SAS, SATA, or SSD drives
Hard disk options	2.5-inch SAS, SATA, or SSD drive options; drive choices are listed in the Cisco UCS C420 M3 Rack Server specifications sheet: http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html
Cisco FlexFlash	The server supports 1 internal 16-GB Cisco FlexFlash drive (SD card). The SD card is preloaded with 4 virtual drives. The 4 virtual drives contain, respectively, the Cisco Server Configuration Utility, the Cisco Host Upgrade Utility, the Cisco C-Series server drivers set, and a blank virtual drive on which you can install an OS or a hypervisor
Internal USB	The server supports 1 internal USB flash drive
Cisco UCS C-Series IMC	• Integrated Emulex Pilot-3 Baseboard Management Controller (BMC) • IPMI 2.0 compliant for management and control • One 10/100/1000 Ethernet out-of-band management interface • CLI and WebGUI management tool for automated, lights-out management • KVM
Front-panel connector	1 KVM console connector (supplies 2 USB, 1 VGA, and 1 serial connector)
Front-panel locator LED	Indicator to help direct administrators to specific servers in large data center environments
Additional rear connectors	Additional interfaces including a VGA video port, 3 USB 2.0 ports, 1 Gigabit Ethernet dedicated management port, quad 1 Gigabit Ethernet ports, and an RS-232 serial connector (on an I/O riser card) serial port
Physical dimensions (H x W x D)	2RU: 3.4 x 18.9 x 31.5 in. (8.9 x 48.1 x 80 cm)
Temperature: Operating	32 to 95°F (0 to 35°C) (at sea level; no fan fail and no CPU throttling)
Temperature: Nonoperating	-40 to 158°F (-40 to 70°C)
Humidity: Operating	10 to 90% noncondensing
Humidity Nonoperating	5 to 93% noncondensing
Altitude: Operating	0 to 10,000 ft (0 to 3000m); maximum ambient temperature decreases by 33.8°F per 984.252 ft (1°C per 300m)
Altitude: Nonoperating	40,000 ft (12,000m)

Regulatory Standards

Table 3 lists regulatory standards compliance information.

Table 3. Regulatory Standards Compliance: Safety and EMC

Safety	• UL 60950-1 No. 21CFR1040 Second Edition • CAN/CSA-C22.2 No. 60950-1 Second Edition • IEC 60950-1 Second Edition • EN 60950-1 Second Edition • IEC 60950-1 Second Edition • AS/NZS 60950-1 • GB4943 2001
EMC: Emissions	• 47CFR Part 15 (CFR 47) Class A • AS/NZS CISPR22 Class A • CISPR2 2 Class A • EN55022 Class A • ICES003 Class A • VCCI Class A • EN61000-3-2 • EN61000-3-3 • KN22 Class A • CNS13438 Class A
EMC: Immunity	• EN55024 • CISPR24 • EN300386 • KN24

Ordering Information

For a complete list of part numbers, please refer to the corresponding specifications sheet:
http://www.cisco.com/en/US/products/ps10493/products_data_sheets_list.html.

Cisco Unified Computing Services

Using a unified view of data center resources, Cisco and our industry-leading partners deliver services that accelerate your transition to a Cisco UCS C-Series Rack Server solution. Cisco Unified Computing Services helps you quickly deploy the servers, optimize ongoing operations to better meet your business needs, and migrate to Cisco's unified computing architecture. For more information, refer to http://www.cisco.com/go/unifiedcomputingservices.

For More Information

Please visit http://www.cisco.com/go/unifiedcomputing.