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CISCO
The bridge to possible

Cisco HyperFlex Express HX245c M6 and HX245c M6 All Flash Nodes

Fast path to hybrid cloud: high-capacity clusters for storage-intensive applications

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Today's applications live across a complex, multidomain world—from enterprise data centers and private and public clouds, to campus, branch, and edge locations. Cisco HyperFlex systems with AMD EPYC processors make it easy to modernize and simplify deployment and operation. Engineered with Cisco Unified Computing System (Cisco UCS) technology, and managed through the Cisco Intersight cloud-operations platform, Cisco HyperFlex systems deliver flexible scale-out infrastructure that can rapidly adapt to changing business demands.

We have created Cisco HyperFlex Express to simplify the onboarding process, especially for new customers, to get products on site quickly. Cisco HyperFlex Express delivers "high-velocity transactions" with simplified ordering and fast delivery. With HyperFlex Express, we have taken our most popular Cisco HyperFlex node configurations, added a few simple and important options, priced them attractively to deliver optimal value, and reduced transaction times to help keep your plans on track.

Cisco HyperFlex: Simplicity you can build on

With hybrid Small-Form-Factor (SFF) and Large-Form-Factor (LFF), or all-flash-memory storage configurations and cloud-based management, Cisco HyperFlex Express HX245c M6 Nodes are deployed as a preintegrated cluster with a unified pool of resources that you can quickly provision, adapt, scale, and manage to efficiently power your applications and your business (Figure 1). Based on AMD EPYC processors, these systems have world-record-setting processors with up to 128 cores per node and up to 4 TB of memory per node.
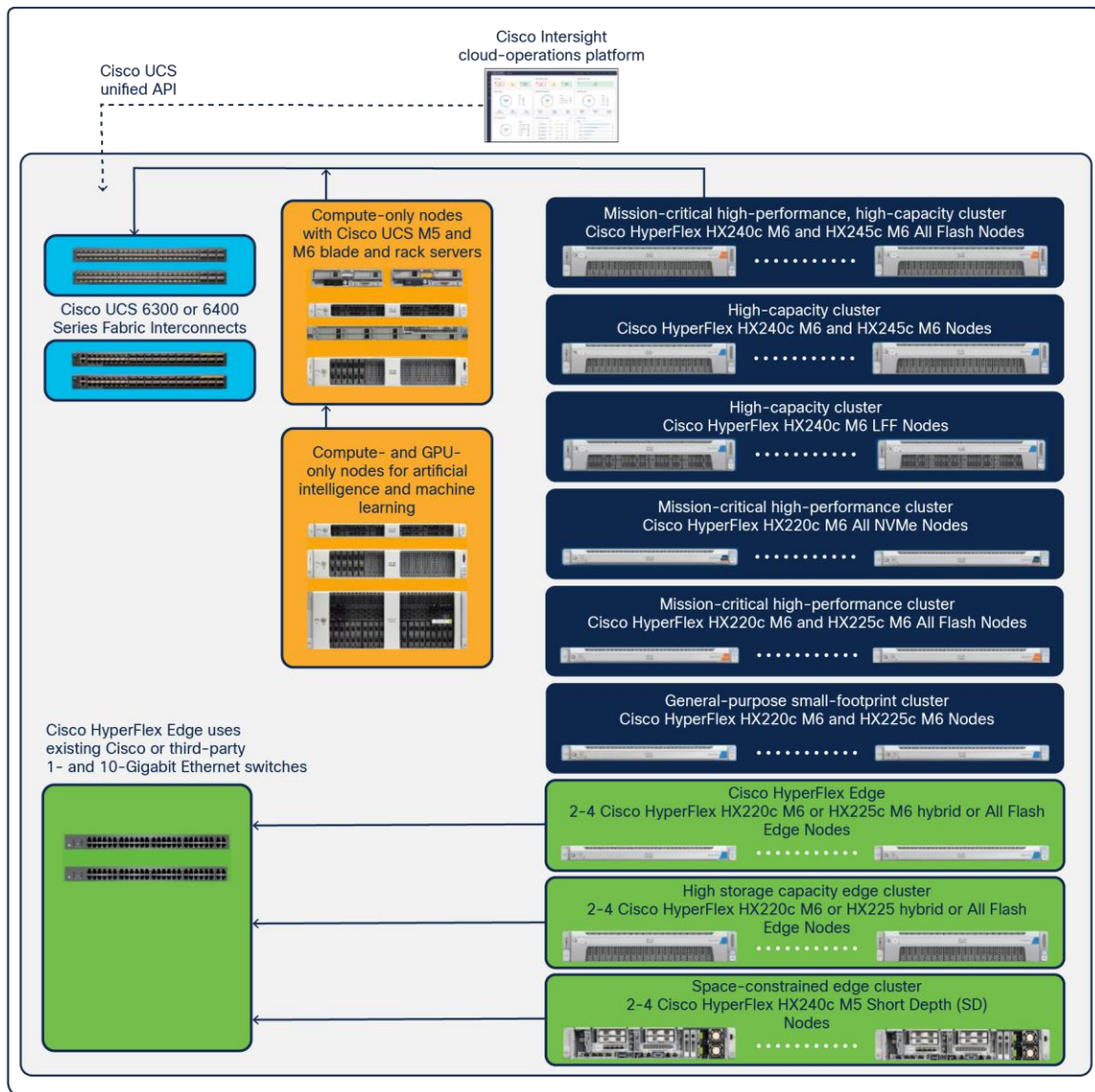
Figure 1.
Cisco HyperFlex systems product family

Cisco HyperFlex Express HX245c M6 Node family

The Cisco HyperFlex Express HX245c M6 Node family delivers high disk capacity (up to 28 drives) in a 2-socket, 2RU package ideal for storage-intensive applications. Physically, the system is delivered as a cluster of three or more Cisco HyperFlex Express HX245c M6 Nodes or Cisco HyperFlex Express HX245c M6 All Flash Nodes. The nodes are integrated into a single system by a pair of Cisco UCS 6300 or 6400 Series Fabric Interconnects, creating clusters that deliver the performance and storage capacity needed by workloads or can be deployed in Data Center No Fabric Interconnect mode.

Features and benefits

Table 1.   Summary of features and benefits of Cisco HyperFlex Express HX245c M6

Feature	Benefit	
Chassis	● Two-rack-unit (2RU) chassis	
Memory	● 32 DIMM slots (16 DIMMs per CPU socket), 3200 MHZ DDR4 for up to 4 TB of capacity	
AMD EPYC processors	● One or two 3rd Gen AMD EPYC CPUs	
Network	● Easy deployment in existing edge locations ● Use of existing top-of-rack 1 Gigabit Ethernet or 10/25 Gigabit Ethernet switching networks for cluster communication ● Support for single and dual switch configurations	
Expansion	The C245 M6 SFF server has: ● Up to 24 front SFF SAS/SATA HDDs or SSDs (Optionally, up to four of the drives can be NVMes.) ● An I/O-centric option that provides up to eight PCIe slots using three rear risers, or ● A storage-centric option that provides three rear risers with a total of up to four NVMe SFF drives and three PCIe slots The server provides internal slots for: ● Two Cisco 12G SAS HBAs to control SAS/SATA drives The HX245c Express M6 Node has a single 1-GE management port. A modular, LAN-on-motherboard slot can be extended to an OCP 3.0 slot and provides up to two 100-GE ports. A connector on the front of the chassis provides KVM functionality.	
Cloud-based management	● Cisco Intersight simplifies operations across on-premises data centers, edge sites, and public clouds. ● Use a software-as-a-service platform that bridges applications with infrastructure ● Gain instant access to clusters regardless of where they are deployed ● Correlate visibility and management across bare-metal servers, hypervisors, Kubernetes, and serverless and application components ● Transform operations with artificial intelligence to reach needed scale and velocity ● Collaborate and work smarter and faster by automating lifecycle workflows ● Support compliance and governance with extensible, open capabilities that natively integrate with third-party platforms and tools ● Proactively respond to impending issues with a recommendation engine that determines when capacity needs to be scaled	Additional management capabilities include: ● Optional Installation wizard for automated configuration ● Support for the VMware vSphere plug-in ● Support for the Cisco HyperFlex Connect interface with an HTML 5 presentation layer accessible on desktop and laptop computers and mobile devices
Storage	● Up to 24 front SFF SAS/SATA HDDs or SSDs (Optionally, up to four of the drives can be NVMes.) ● An I/O-centric option that provides up to eight PCIe slots using three rear risers, or ● A storage-centric option that provides three rear risers with a total of up to four NVMe SFF drives and three PCIe slots	

Feature	Benefit
Enterprise data protection	• Pointer-based snapshot capabilities • Native snapshots for iSCSI LUNs, including a consistency group for snapshot operations, instantaneous snapshot creation, and RESTful APIs for snapshot creation and third-party backup use • Snapshot integration with MEDITECH-BridgeHead for electronic health records and databases • Near-instant cloning • Inline deduplication and compression • Native replication for disaster recovery • N:1 replication for data center clusters with fabric interconnects and more than 4 nodes, as well as a flexible retention policy for local and remote point-in-time copies • Data-at-rest encryption using self-encrypting drives and enterprise key management integration
Security	• Locking bezel option to protect against unauthorized access to disk drives
Software	• Cisco HyperFlex HX Data Platform Software (software subscription, Data Center license)

Product specifications

Table 2.   Common specifications for Cisco HyperFlex HX245c M6 Node and Cisco HyperFlex HX245c All Flash Nodes

Capability / feature	Description
Chassis	Two-rack-unit (2RU) chassis
CPU	One or two 3rd Gen AMD EPYC CPUs
Memory	• 32 DIMM slots (16 DIMMs per CPU socket), 3200 MHZ DDR4 for up to 4 TB of capacity
Multi-bit error protection	This server supports multi-bit error protection.
Video	The Cisco Integrated Management Controller (Cisco IMC) provides video using the Matrox- G200e video/graphics controller: • Integrated 2D graphics core with hardware acceleration • Embedded DDR memory interface supports up to 512 MB of addressable memory (8 MB is allocated by default to video memory) • Supports display resolutions up to 1920 x 1200 16 bpp @ 60 Hz • High-speed, integrated 24-bit RAMDAC • Single-lane PCI-Express host interface running at Gen 1 speed
Power subsystem	Up to two of the following hot-swappable power supplies: • 1050 W (AC) • 1050 W (DC) • 1600 W (AC) • 2300 W (AC) One power supply is mandatory; one more can be added for 1 + 1 redundancy.
Front panel	A front-panel controller provides status indications and control buttons.
ACPI	This server supports the Advanced Configuration and Power Interface (ACPI) 4.0 standard.

Capability / feature	Description
Fans	Six hot-swappable fans for front-to-rear cooling
InfiniBand	The InfiniBand architecture is supported by the PCIe slots.
Expansion slots	• Riser 1A (3 PCIe slots) • Riser 1B (2 drive bays) • Riser 2A (3 PCIe slots) • Riser 3A (2 PCIe slots) • Riser 3B (2 drive bays) • Riser 3C (1 PCIe slot)
Interfaces	Rear panel: • One 1GBASE-T RJ-45 management port • One RS-232 serial port (RJ45 connector) • One DB15 VGA connector • Two USB 3.0 port connectors • One flexible modular LAN-on-motherboard (mLOM)/OCP 3.0 slot that can accommodate various interface cards Front panel: • One KVM console connector (supplies two USB 2.0 connectors, one VGA DB15 video connector, and one serial port (RS232) RJ45 connector) • Up to 24 front SFF SAS/SATA Hard Drives (HDDs) or SAS/SATA Solid State Drives (SSDs) • Optionally, up to four front SFF NVMe PCIe SSDs These drives must be placed in front drive bays 1, 2, 3, and 4 only and are connected to CPU 2. The rest of the bays (5-24) can be populated with SAS/SATA SSDs or HDDs. • Optionally, up to four SFF rear-facing NVMe drives

Internal storage devices	Other storage:
	• A mini-storage module connector on the motherboard supports a boot-optimized RAID controller carrier that holds two SATA M.2 SSDs. Mixing different capacity SATA M.2 SSDs is not supported.
	  ◦ Cisco HX245c Express M6 All Flash Node (HXAF245C-M6SX-EXP)
	    ◦ Data drives: 3 to 26 SATA SSDs
	    ◦ Cache drive: 1 NVMe/SAS SSD
	    ◦ Logging drive: 1 SATA SSD
	  ◦ Cisco HX245c Express M6 (hybrid) Node (HX245C-M6SX-EXP)
	    ◦ Data drives: 3 to 26 SAS HDD
	    ◦ Cache drive: 1 SAS SSD
	    ◦ Logging drive: 1 SATA SSD

Integrated management controller	A Baseboard Management Controller (BMC) runs Cisco Integrated Management Controller (Cisco IMC) firmware. Depending on your settings, the controller can be accessed through the 1-GE dedicated management port or a Cisco Virtual Interface Card (VIC). Cisco IMC manages certain components within the server, such as the Cisco 12G SAS HBA.

Capability / feature	Description
Storage controllers	One Cisco M6 12G SAS RAID controller or up to two Cisco 12G SAS HBAs plug into a dedicated slot. Cisco 12G SAS HBA: • No RAID support • JBOD/passthrough mode support • Supports up to 16 SAS/SATA internal drives • Plugs into a dedicated slot
Modular LAN-on-motherboard (mLOM) / Open Compute Project (OCP) 3.0 slot	The dedicated mLOM/OCP 3.0 slot on the motherboard can flexibly accommodate the following cards: • Cisco Virtual Interface Cards (VICs) • OCP 3.0 network interface card (UCSC-O-ID10GC)
Cisco Intersight	Cisco Intersight provides server management capabilities
Cisco Integrated Management Controller	Requires Release 4.2(1) or later
Operating temperature	Minimum 10°C to 35°C (50°F to 95°F) with no direct sunlight (if any A10, A100, or rear HDDs are installed, the 35°C (50°F) restriction changes to 30°C (86F) Maximum allowable operating temperature derated 1C/300 m (1F/547 ft) above 950 m (3117 ft)
Extended operating temperature	5°C to 40°C (41°F to 104°F) with no direct sunlight Maximum allowable operating temperature derated 1C/175 m (1F/319 ft) above 950 m (3117 ft) 5°C to 4°5C (41°F to 113°F) with no direct sunlight Maximum allowable operating temperature derated 1C/125 m (1F/228 ft) above 950 m (3117 ft) System performance may be impacted when operating in the extended operating temperature range. Operation above 40°C is limited to less than 1% of annual operating hours. Hardware configuration limits apply to the extended operating temperature range.
Non-operating temperature	Below –40°C or above 65°C (below –40°F or above 149°F) Maximum rate of change (operating and non-operating) 20°C/hr (36°F/hr)
Operating relative humidity	8% to 90% and 24°C (75°F) maximum dew-point temperature, non-condensing environment
Non-operating relative humidity	5% to 95% and 33°C (91°F) maximum dew-point temperature, non-condensing environment
Operating altitude	0 m to 3050 m {10,000 ft)
Non-operating altitude	Below 0 m or above 12,000 m (39,370 ft)

Ordering information

For a complete list of part numbers, refer to the all-flash and hybrid server node and the Cisco HyperFlex HX245c M6 LFF Server Node specification sheets.

Cisco Unified Computing Services

Cisco and our industry-leading partners deliver services that accelerate your transition to Cisco HyperFlex systems. Cisco Unified Computing Services can help you create an agile infrastructure, accelerate time-to-value, reduce costs and risks, and maintain availability during deployment and migration. After you have deployed your system, our services can help you improve performance, availability, and resiliency as your business needs evolve and help you further mitigate risk.

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Reference links to information about key environmental sustainability topics (mentioned in the "Environment Sustainability" section of the CSR Report) are provided in the following table:

Sustainability topic	Reference
Information on product material content laws and regulations	Materials
Information on electronic waste laws and regulations, including products, batteries, and packaging	WEEE compliance

Cisco makes the packaging data available for informational purposes only. It may not reflect the most current legal developments, and Cisco does not represent, warrant, or guarantee that it is complete, accurate, or up to date. This information is subject to change without notice.

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