

Cisco UCS Virtual Interface Card 15000 Series

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Cisco Unified Computing System overview

The Cisco Unified Computing System™ (Cisco UCS®) is a next-generation data center platform that unites computing, networking, storage access, and virtualization resources into a cohesive system designed to reduce Total Cost of Ownership (TCO) and increase business agility. The system integrates a low-latency, lossless 10/25/40/50/100/200 Gigabit Ethernet network fabric with enterprise-class blade, modular, and rack x86-architecture servers. The system is an integrated, scalable, multichassis platform in which all resources participate in a unified management domain.

Portfolio overview

The Cisco UCS Virtual Interface Card (VIC) 15000 Series extends the network fabric directly to both servers and virtual machines so that a single connectivity mechanism can be used to connect both physical and virtual servers with the same level of visibility and control. Cisco® VICs provide complete programmability of the Cisco UCS I/O infrastructure, with the number and type of I/O interfaces configurable on demand with a zero-touch model.

Cisco VICs support Cisco SingleConnect technology, which provides an easy, intelligent, and efficient way to connect and manage computing in your data center. Cisco SingleConnect unifies LAN, SAN, and systems management into one simplified link for rack servers, blade servers, and virtual machines. This technology reduces the number of network adapters, cables, and switches needed and radically simplifies the network, reducing complexity. Cisco VICs can support 512 PCI Express (PCIe) virtual devices, either virtual Network Interface Cards (vNICs) or virtual Host Bus Adapters (vHBAs), with a high rate of I/O Operations Per Second (IOPS), support for lossless Ethernet, and 10/25/40/50/100/200-Gbps connection to servers. The PCIe Generation 4 x16 interface helps ensure optimal bandwidth to the host for network-intensive applications, with a redundant path to the fabric interconnect. Cisco VICs support NIC teaming with fabric failover for increased reliability and availability. In addition, it provides a policy-based, stateless, agile server infrastructure for your data center.

The VIC 15000 series is designed for Cisco UCS X-Series M6/M7/M8 Blade Servers, Cisco UCS B-Series M6 Blade Servers, and Cisco UCS C-Series M6/M7/M8 Rack Servers. The adapters are capable of supporting 10/25/40/50/100/200-Gigabit Ethernet and Fibre Channel over Ethernet (FCoE). They incorporate Cisco's next-generation Converged Network Adapter (CNA) technology and offer a comprehensive feature set, providing investment protection for future feature software releases.

Product overview

Cisco VIC 15230 and 15231

The Cisco UCS VIC 15230 and 15231 (Figure 1) are 2x100-Gbps Ethernet/FCoE-capable modular LAN on motherboard (mLOM) adapters designed exclusively for the Cisco UCS X210c and X215c Compute Nodes. The Cisco UCS VIC 15230 and 15231 adapters enable a policy-based, stateless, agile server infrastructure that can present to the host PCIe standards-compliant interfaces that can be dynamically configured as either NICs or HBAs.

The Cisco UCS VIC 15230 is functionally equivalent to the 15231, but incorporates secure boot technology.



Figure 1.
Cisco UCS VIC 15230 and 15231

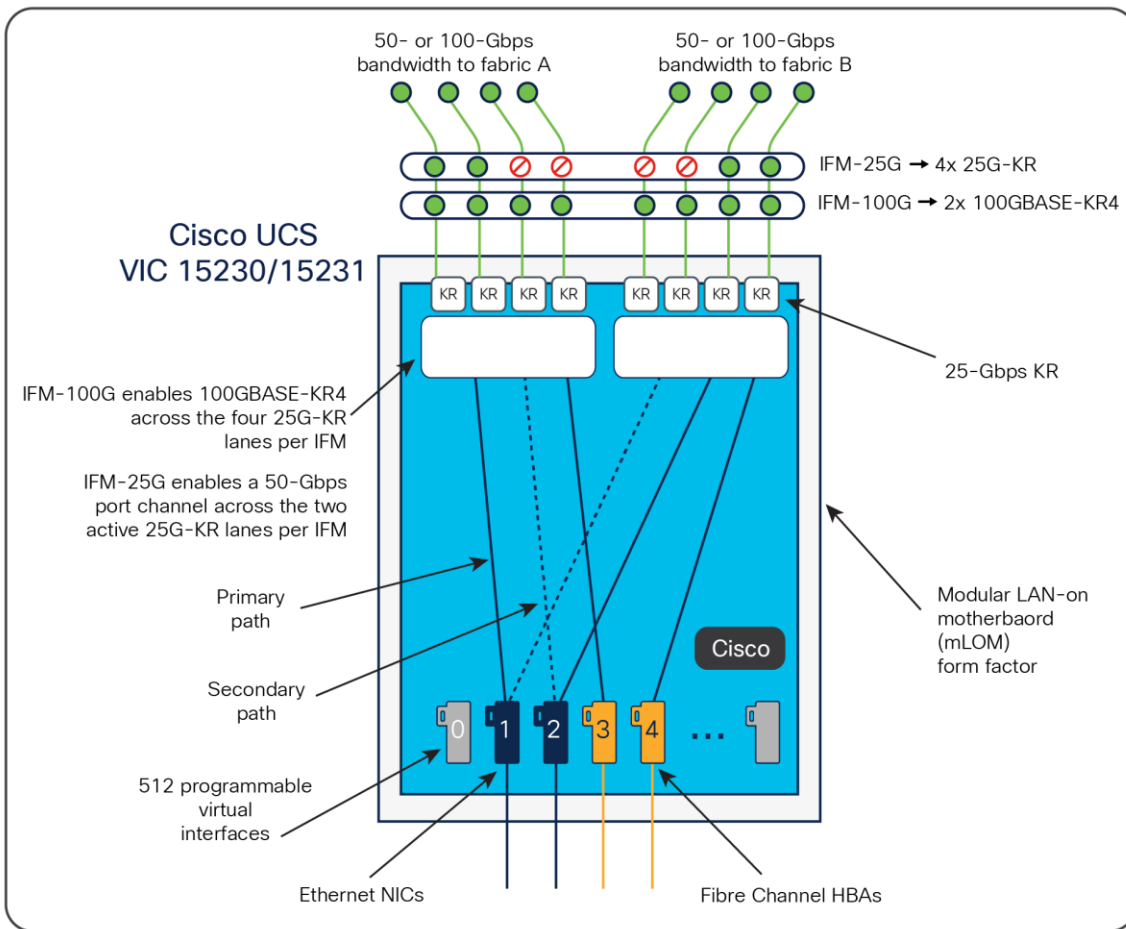


Figure 2.
Cisco UCS VIC 15230 and 15231 Infrastructure

Cisco VIC 15420

The Cisco UCS VIC 15420 (Figure 3) is a 4x25-Gbps Ethernet/FCoE capable modular LAN On Motherboard (mLOM) designed exclusively for Cisco UCS X210c M6/M7, X410c M7, and X215c M8 Compute Nodes. The Cisco UCS VIC 15420 enables a policy-based, stateless, agile server infrastructure that can present to the host PCIe standards-compliant interfaces that can be dynamically configured as either NICs or HBAs.



Figure 3.
Cisco UCS VIC 15420

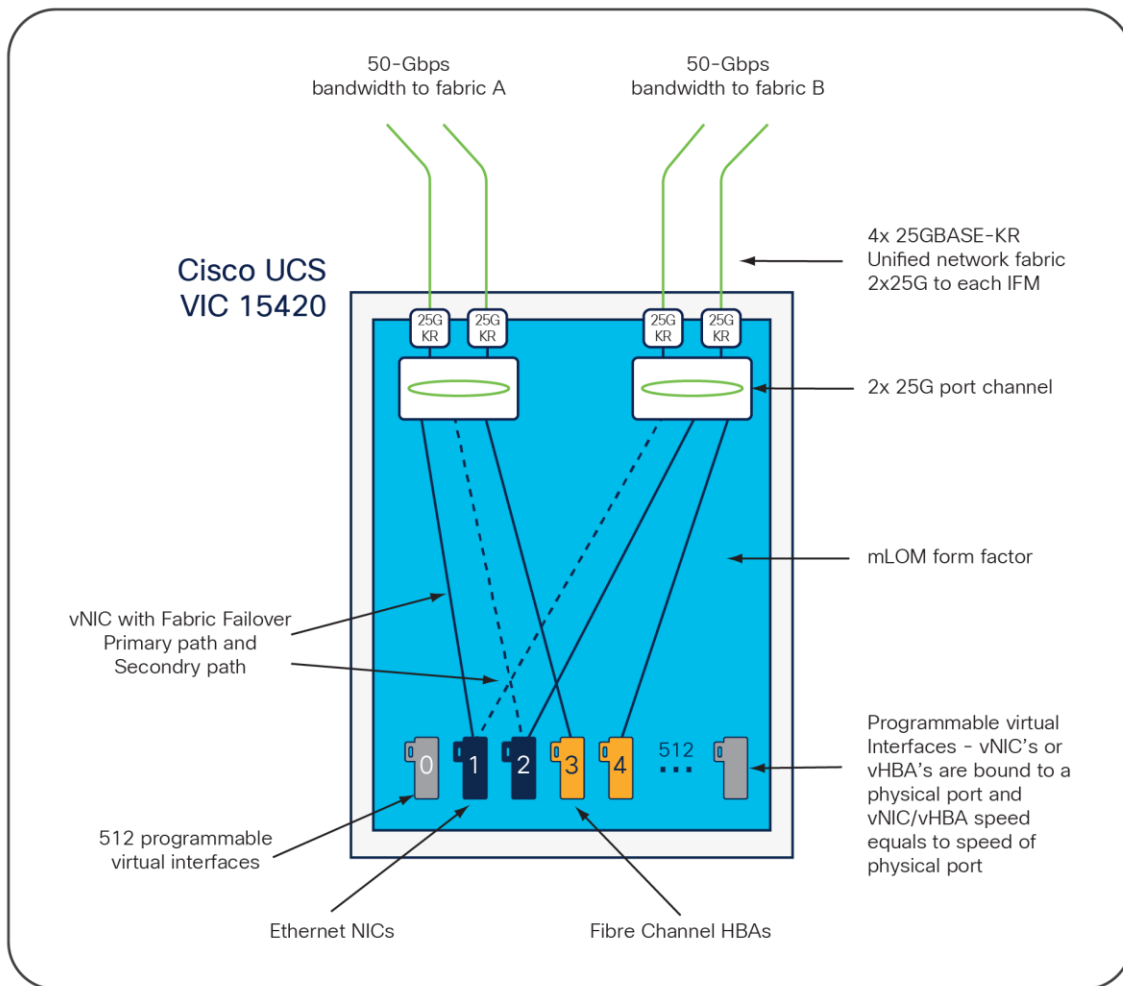


Figure 4.
Cisco UCS VIC 15420 Infrastructure

Cisco VIC 15422

The Cisco UCS VIC 15422 (Figure 5) is a 4x25-Gbps Ethernet/FCoE capable mezzanine card (mezz) designed exclusively for Cisco UCS X210c M6/M7, X410c M7, and X215c M8 compute nodes. The card enables a policy-based, stateless, agile server infrastructure that can present PCIe standards-compliant interfaces to the host that can be dynamically configured as either NICs or HBAs.

The UCS VIC 15000 bridge connector (Figure 6) is required with the mezz card to connect the UCS X-Series Blade Server to Intelligent Fabric Module (IFM) UCSX-I-9108-25G or UCSX-I-9108-100G.

In addition to Ethernet network connectivity to the IFM, the VIC 15422 also provides two PCIe x16 Gen4 links to the UCS 9416 X-fabric module for enabling Cisco UCS X440p PCIe node connectivity for the X210c, X410c, and X215c compute nodes.

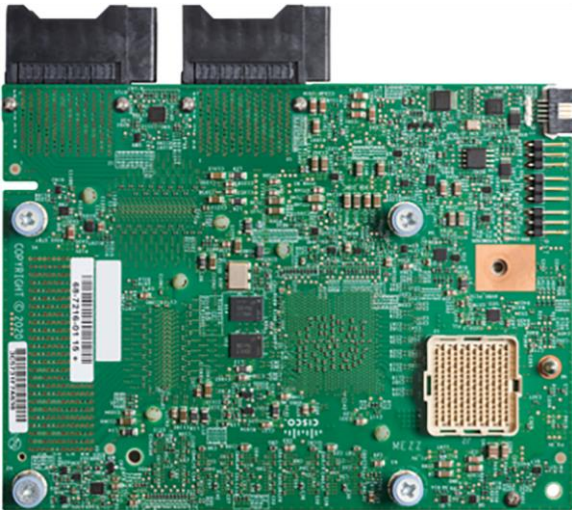


Figure 5.
Cisco UCS VIC 15422

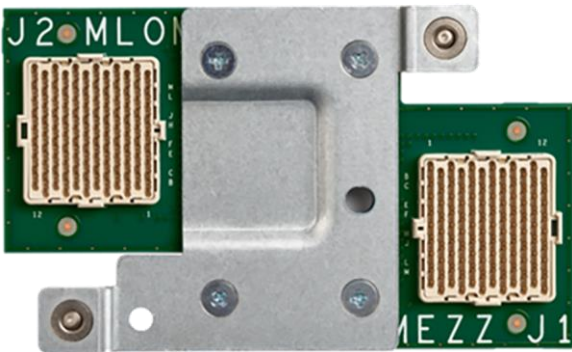


Figure 6.
Cisco UCS VIC 15000 bridge connect

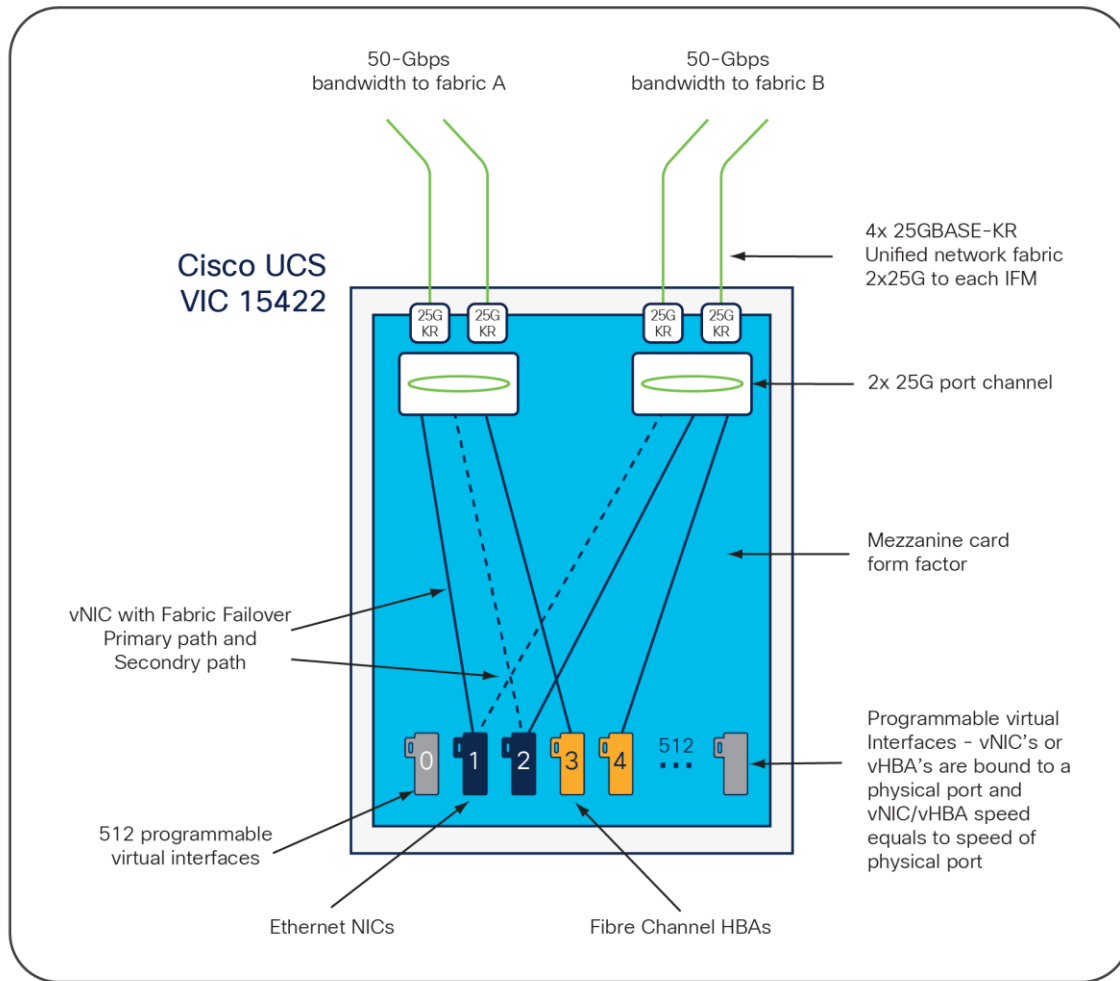


Figure 7.
Cisco UCS VIC 15422 Infrastructure

Cisco VIC 15427 and 15428

The Cisco UCS VIC 15427 and 15428 (Figure 8) are a quad-port small-form-factor pluggable (SFP+/SFP28/SFP56) mLOM card designed for Cisco UCS C-series M6/M7/M8 rack servers. The card supports 10/25/50-Gbps Ethernet or FCoE. The card can present PCIe standards-compliant interfaces to the host, and these can be dynamically configured as either NICs or HBAs.

The Cisco UCS VIC 15427 is functionally equivalent to the 15428, but incorporates secure boot technology.

When a UCS rack server with VIC 15427 or 15428 is connected to a fabric interconnect (FI-6536/6400/6300), the VIC 15428 is provisioned through Cisco Intersight™ Managed Mode (IMM) or Cisco UCS Manager (UCSM) policies. When the UCS rack server with VIC 15427 or 15428 is connected to a ToR switch such as Cisco Nexus® 9000 Series, the VIC adapter is provisioned through the Cisco Integrated Management Controller (IMC) or Intersight policies for a standalone server.



Figure 8.
Cisco UCS VIC 15427 and 15428

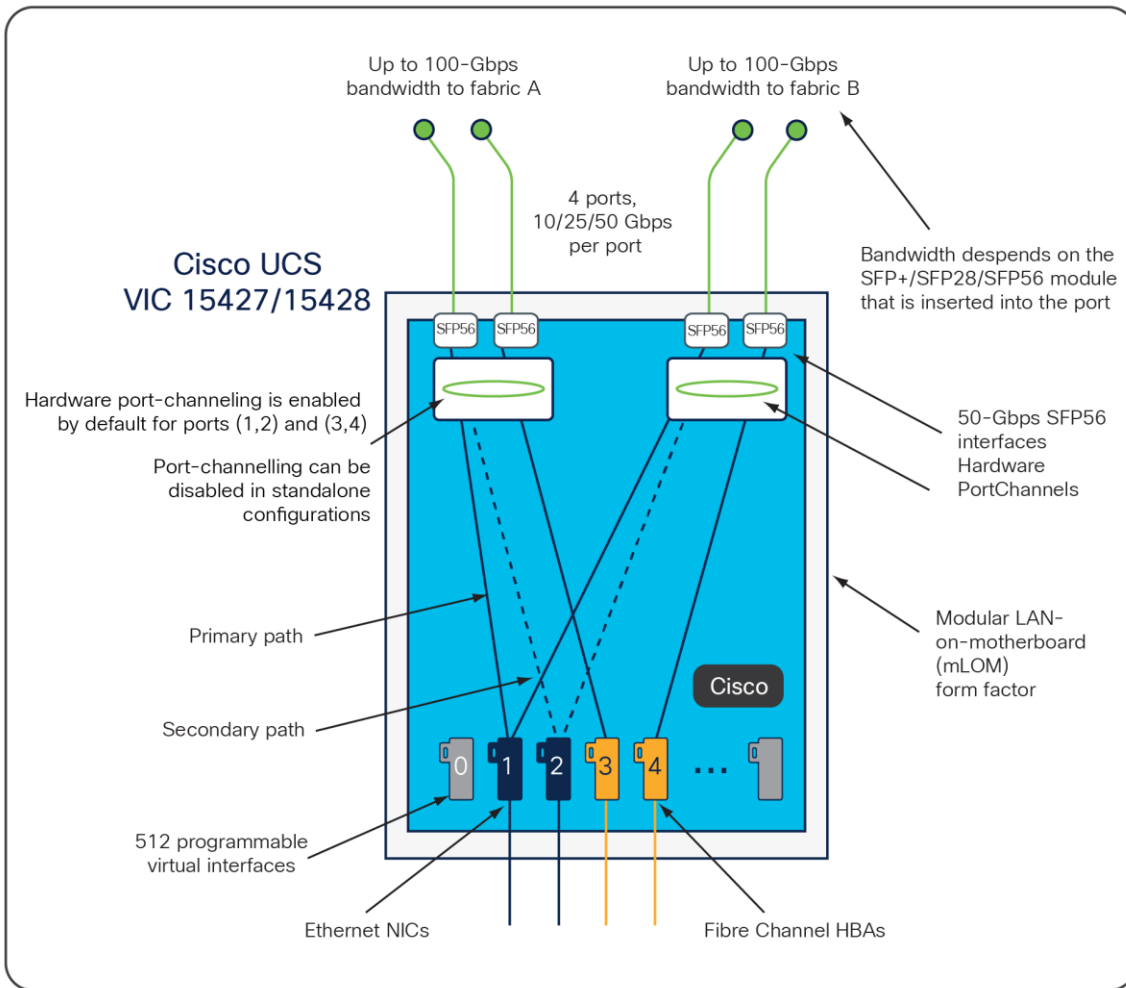


Figure 9.
Cisco UCS VIC 15427 and 15428 Infrastructure

Cisco VIC 15237 and 15238

The Cisco UCS VIC 15237 and 15238 (Figure 10) are dual-port quad small-form-factor pluggable (QSFP/QSFP28/QSFP56) mLOM cards designed for Cisco UCS C-series M6/M7/M8 rack servers. The card supports 40/100/200-Gbps Ethernet or FCoE. The card can present PCIe standards-compliant interfaces to the host, and these can be dynamically configured as either NICs or HBAs.

The Cisco UCS VIC 15237 is functionally equivalent to the 15238, but incorporates secure boot technology.

When a UCS rack server with VIC 15237 or 15238 is connected to a fabric interconnect (FI-6536/6300), the VIC adapter is provisioned through Cisco Intersight Managed Mode (IMM) or Cisco UCS Manager (UCSM) policies. When the UCS rack server with VIC 15237 or 15238 is connected to a ToR switch such as Cisco Nexus 9000 Series, the VIC adapter is provisioned through the Cisco IMC or Intersight policies for a UCS standalone server.



Figure 10.
Cisco UCS VIC 15237 and 15238

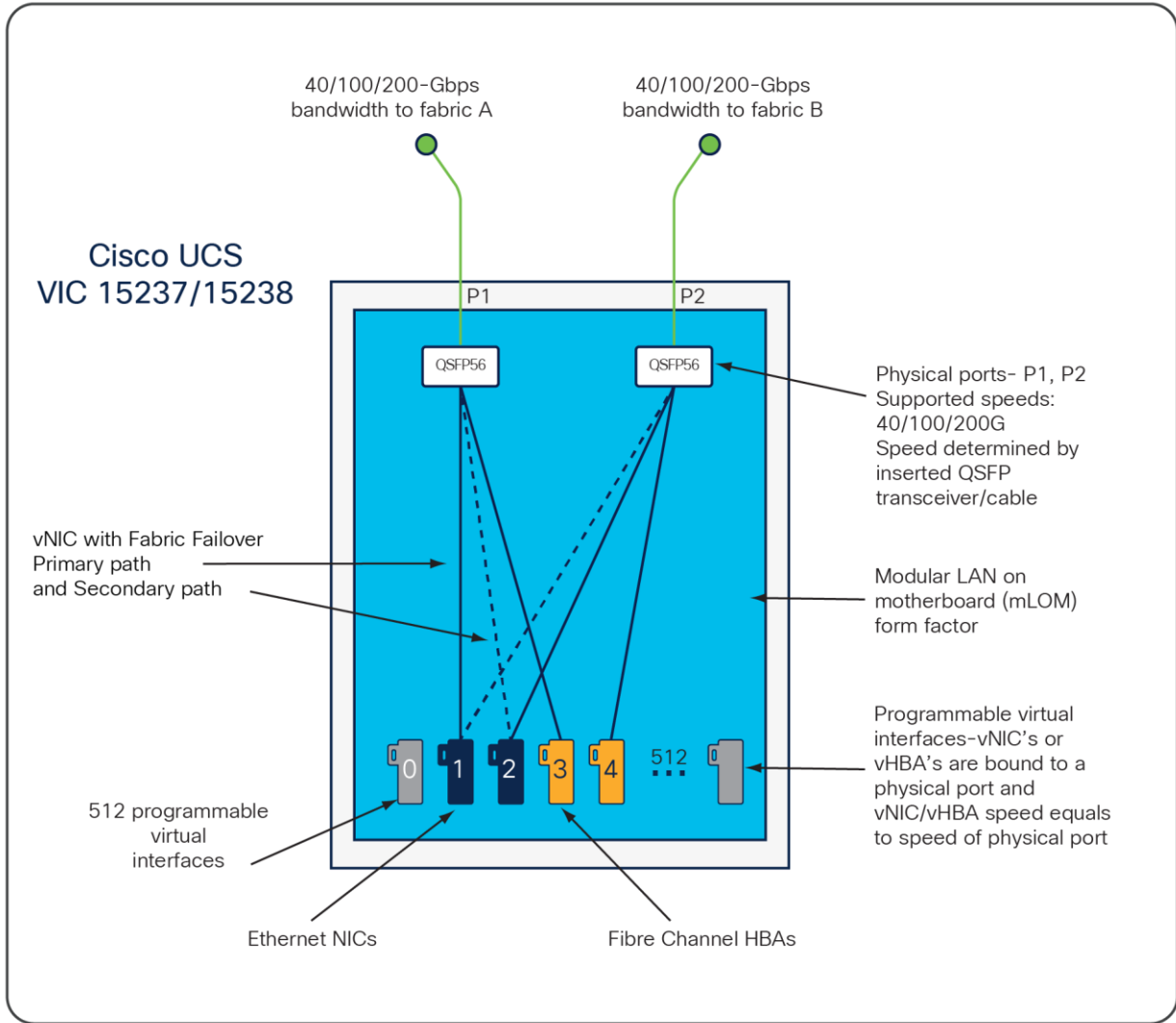


Figure 11.
Cisco UCS VIC 15237 and 15238 infrastructure

Cisco VIC 15411

The Cisco UCS VIC 15411 (Figure 12) is a dual-port 40-Gbps or 4x10-Gbps Ethernet/FCoE-capable modular LAN on motherboard (mLOM) designed for Cisco UCS B-Series M6 Blade Servers. When used in combination with an optional port expander, the Cisco UCS VIC 15411 capabilities are enabled for two ports of 40-Gbps Ethernet. The Cisco UCS VIC 15411 enables a policy-based, stateless, agile server infrastructure that can present to the host PCIe standards-compliant interfaces that can be dynamically configured as either NICs or HBAs.

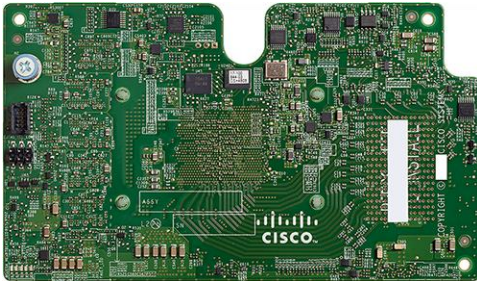


Figure 12.
Cisco UCS VIC 15411

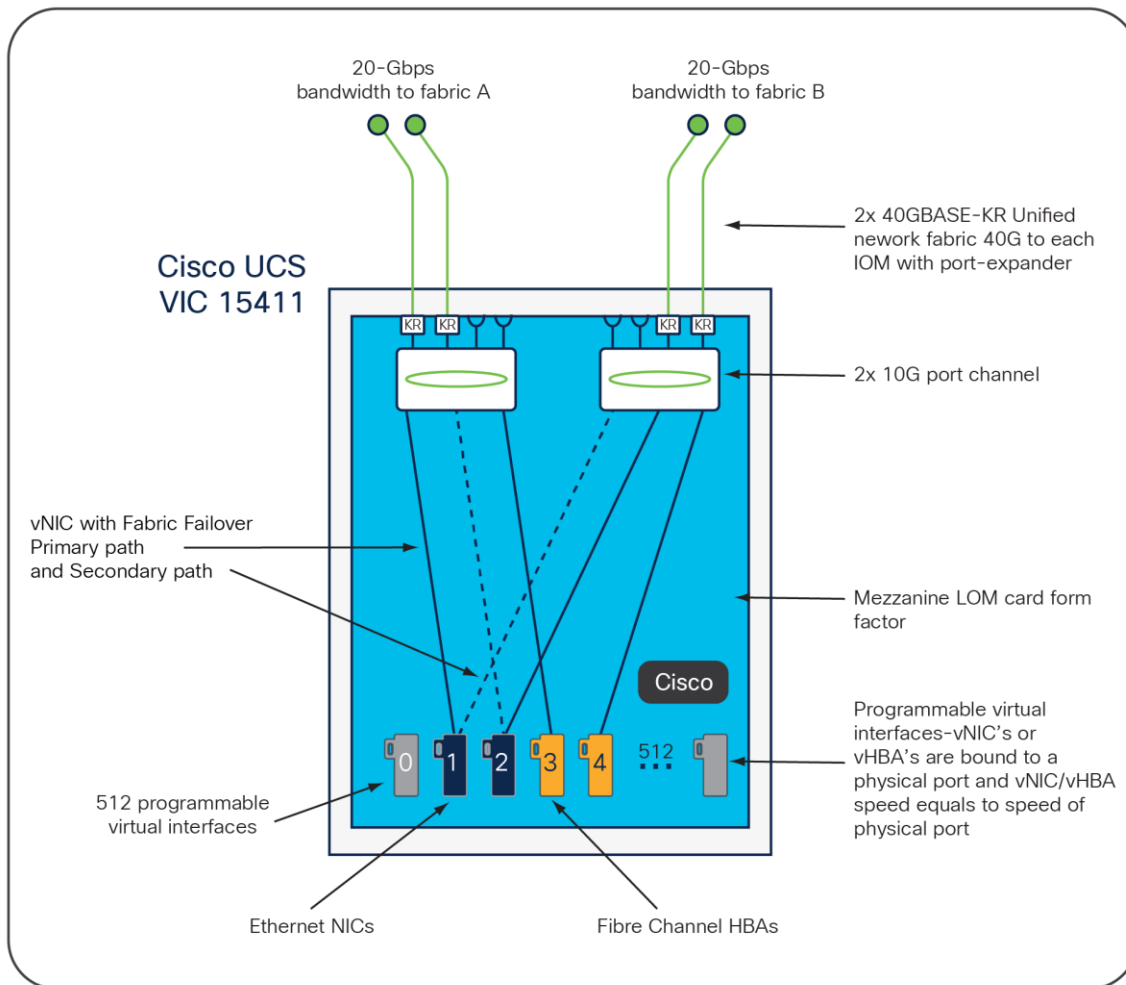


Figure 13.
Cisco UCS VIC 15411 infrastructure

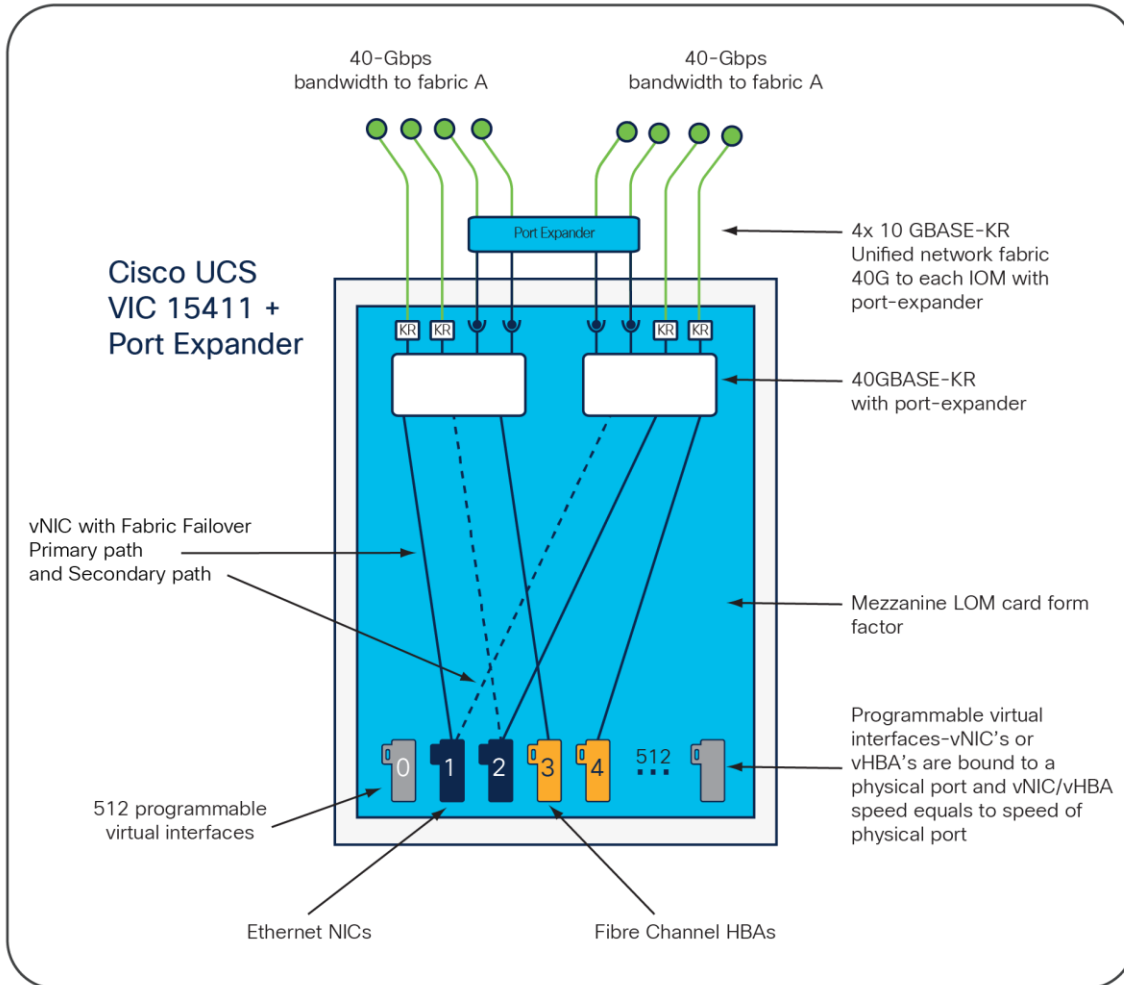


Figure 14.
Cisco UCS VIC 15411 with port expander

Cisco VIC 15235

The Cisco UCS VIC 15235 (Figure 15) is a dual-port quad small-form-factor pluggable (QSFP/QSFP28/QSFP56) PCIe card designed for Cisco UCS C-series M6/M7/M8 rack servers. The card supports 40/100/200-Gbps Ethernet or FCoE. The card can present PCIe standards-compliant interfaces to the host, and these can be dynamically configured as either NICs or HBAs.

When a UCS rack server with VIC 15235 is connected to a fabric interconnect (FI-6536/6300), the VIC 15235 is provisioned through Cisco Intersight Managed Mode (IMM) or Cisco UCS Manager (UCSM) policies. When the UCS rack server with VIC 15235 is connected to a ToR switch such as Cisco Nexus 9000 Series, the VIC 15235 is provisioned through the Cisco IMC or Intersight policies for a UCS standalone server.



Figure 15.
Cisco UCS VIC 15235

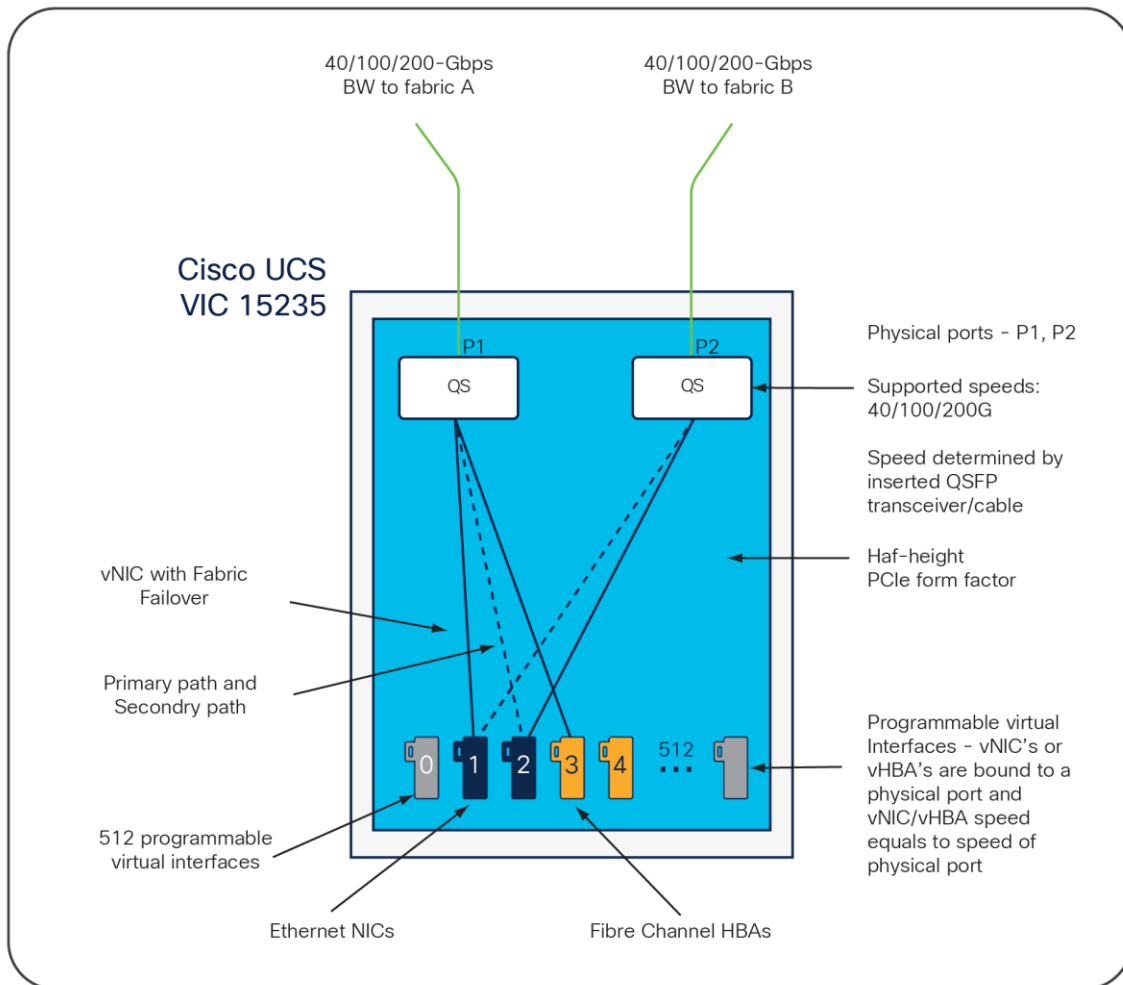


Figure 16.
Cisco UCS VIC 15235 infrastructure

Cisco VIC 15425

The Cisco UCS VIC 15425 (Figure 17) is a quad-port small-form-factor pluggable (SFP+/SFP28/SFP56) PCIe card designed for Cisco UCS C-series M6/M7/M8 rack servers. The card supports 10/25/50-Gbps Ethernet or FCoE. The card can present PCIe standards-compliant interfaces to the host, and these can be dynamically configured as either NICs or HBAs.

When a UCS rack server with VIC 15425 is connected to a fabric interconnect (FI-6536/6400/6300), the VIC 15425 is provisioned through Cisco Intersight Managed Mode (IMM) or Cisco UCS Manager (UCSM) policies. When the UCS rack server with VIC 15425 is connected to a ToR switch such as Cisco Nexus® 9000 Series, the VIC 15425 is provisioned through the Cisco IMC or Intersight policies for a standalone server.



Figure 17.
Cisco UCS VIC 15425

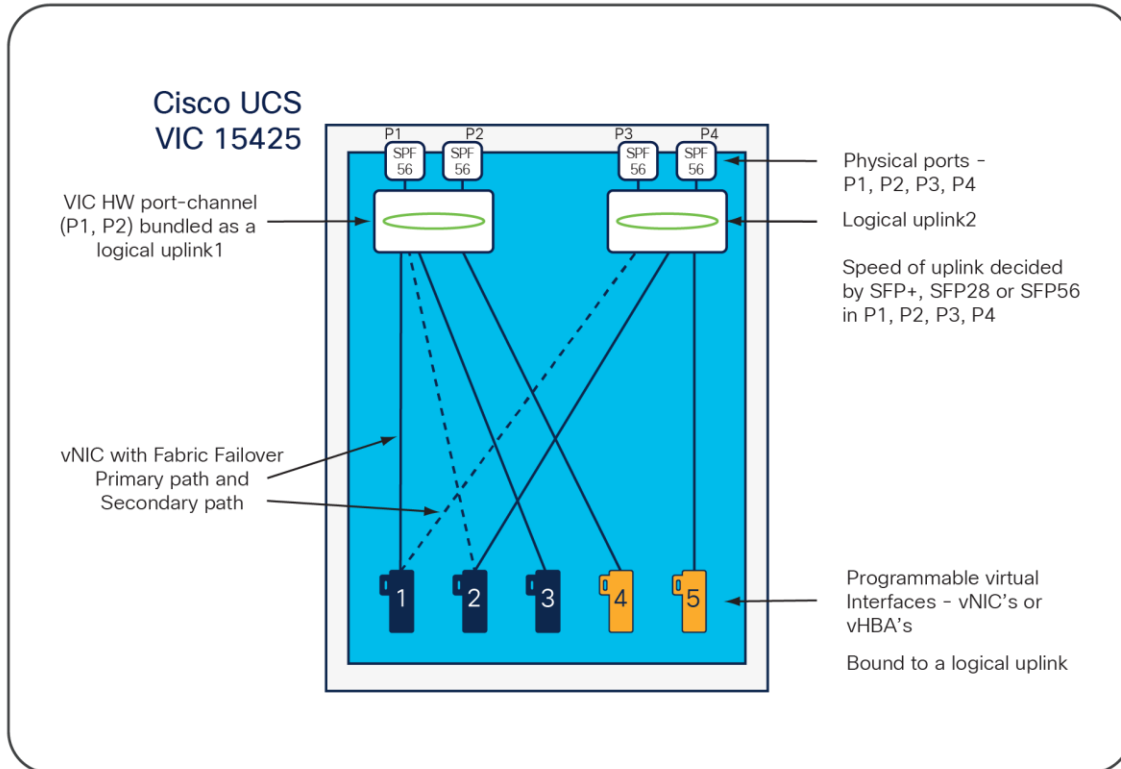


Figure 18.
Cisco UCS VIC 15425 Infrastructure

Features and benefits

The Cisco UCS VIC 15000 Series provide the following features and benefits:

- Stateless and agile platform: The personality of the card is determined dynamically at boot time using the service profile associated with the server. The number, type (NIC or HBA), identity (MAC address and World Wide Name [WWN]), failover policy, bandwidth, and Quality-of-Service (QoS) policies of the PCIe interfaces are all determined using the service profile. The capability to define, create, and use interfaces on demand provides a stateless and agile server infrastructure.
- Network interface virtualization: Each PCIe interface created on the VIC is associated with an interface on the Cisco UCS fabric interconnect, providing complete network separation for each virtual cable between a PCIe device on the VIC and the interface on the fabric interconnect.

Next-generation data center features

A hardware classification engine provides support for advanced data center requirements, including stateless network offloads for VXLAN, NVGRE, and GENEVE. Additional features support low-latency kernel bypass for performance optimization through usNIC, DPDK, SR-IOV and server virtualization support using NetQueue and VMQ/VMMQ. The Cisco UCS VIC 15000 Series provide high network performance and low latency for the most demanding applications:

- Big data, High-Performance Computing (HPC)
- Large-scale virtual machine deployments
- High-bandwidth storage targets and archives
- NVMe over Fabrics support for NVMe over RoCEv2, NVMe/FC, NVMe/TCP

The Cisco VIC provides industry-leading performance and features.

Table 1 summarizes the main features and benefits of the Cisco UCS VIC 15000 Series.

Table 1. Features and benefits

Features	Benefits
PCIe x16 Gen4 interfaces	Delivers high performance (200 Gb/s) throughput
10/25/40/50/100/200-Gbps unified I/O	<ul style="list-style-type: none"> • Delivers 4x 10/25/50-Gbps or 2x 40/100/200-Gbps in a single VIC configuration with a Cisco UCS C-Series M6/M7/M8 Rack Server • Delivers 2x 100-Gbps or 4x 25-Gbps in a single VIC configuration with the Cisco UCS X210c M6/M7, X410c M7, and X215c M8 compute nodes with Cisco UCS FI-6536/6400 • Delivers 2x 40-Gbps or 4x 10-Gbps in a single VIC configuration with the Cisco UCS B-Series M6 Blade Server with Cisco UCS FI-6536/6400/6300 • Helps reduce TCO by consolidating the overall number of NICs, HBAs, cables, and switches because LAN and SAN traffic run over the same adapter card and fabric
512 virtual adapters and interfaces	<ul style="list-style-type: none"> • Creates fully functional unique and independent PCIe adapters and interfaces (NICs and HBAs) without requiring single-root I/O virtualization (SR-IOV) support from Oses or hypervisors • Allows these virtual interfaces and adapters to be configured and operated independently, just like physical interfaces and adapters • Creates a highly flexible I/O environment needing only one card for all I/O configurations <p>Note: Cisco UCS VIC 15000 Series hardware is SR-IOV capable. Please refer to Cisco UCS Manager configuration limits for your specific OS and environment in the configuration guide.</p>
Low-latency connectivity	Supports usNIC technology, delivering latency as low as 1 microsecond in back-to-back VIC connections; standard latency using the Cisco Nexus series switches in approximately 1-2 microseconds
Cisco SingleConnect technology	A single unified network: the same network brings LAN, SAN, and management connectivity to each server.
VIC Secure Boot technology	<p>VIC Secure Boot, available for C-Series and X-Series platforms on select VIC models, ensures the integrity of the VIC hardware and firmware upon server boot.</p> <p>VIC Secure Boot is independent of server-level secure boot technologies from Cisco, Intel, and AMD, but all of these technologies contribute to the Cisco trust model ensuring customers' equipment is genuine and running validated firmware.</p>
Centralized management	Enables the mLOM and mezzanine in X-Series, and mLOM or PCIe for M6/M7 rack servers, to be centrally configured and managed by Cisco Intersight

Features	Benefits
Support for advanced features	<ul style="list-style-type: none"> • usNIC • 802.1Q (QinQ) • Small Computer System Interface over IP (iSCSI) and iSCSI boot • Ethernet NIC (eNIC) and Fibre Channel NIC (fNIC) • DPDK • NetFlow • N-Port ID Virtualization (NPIV) • Receive flow steering • Multi-RQ • 16K extended (TX/RX) ring • PTPv2 (Linux only) • VMware NetQueue • Windows VMQ/VMMQ • Receive side scaling (IPv4/IPv6/UDP/TCP) • GENEVE offload support with VMware NSX-T • VXLAN offload support for VMware NSX-V, Linux (RHEL, SLES) • ENS support for VMware NSX-T • VXLAN and NVGRE support on Windows • NVMe over RoCEv2 support with RHEL • NVMe over RoCEv2 support with ESXi • NVMe-TCP qualified with ESXi • NVMe-TCP qualified with RHEL • SMB Direct support on Windows 2019 and windows 2022 using RDMA over converged Ethernet RoCEv2 • VIC secure boot (available with VIC 15420 and 15422 from 4.3(1) release, VIC 15235 and 15425 from 4.3(2) release, and VIC 15230, 15237, and 15427 from 4.3(2c) release) • SR-IOV (Support for ESXi with M7 rack-servers in IMC from 4.3(1) release)
Fibre Channel	<ul style="list-style-type: none"> • Supports Fibre Channel over the UCS unified fabric with Cisco UCS Fabric Interconnect 6300 Series, 6400 Series and 6536 • Supports NVMe over Fabrics (NVMeoF) for Fibre Channel (FC-NVMe) with RHEL, SLES, and ESXi • Supports FC multiqueue (FC MQ) on RHEL and SLES • FDMI on Linux and ESX • Supports FCoE Fibre Channel when connected to Cisco Nexus 9000 Series Switches
Network architecture	Provides a redundant path to the fabric interconnect using hardware-based fabric failover
High performance I/O	Supports over 900,000 I/O operations per second (IOPS)

Features	Benefits
Lossless Ethernet	Uses Priority Flow Control (PFC) to enable lossless Ethernet as part of the Cisco UCS Unified Fabric
Broad OS and hypervisor support	Supports customer requirements for VMware vSphere, Microsoft Windows, Red Hat Enterprise Linux, Citrix XenServer, SUSE Linux Enterprise Server, and Ubuntu. Refer to the Hardware Compatibility List (HCL) for detail list of supported operating systems

Product specifications

Table 2 lists the specifications for the Cisco UCS VIC 15000 Series.

Table 2. Cisco UCS VIC 15000 Series specifications

Items	Specifications
Standards	<ul style="list-style-type: none"> • 10-Gigabit Ethernet • 25-Gigabit Ethernet • 40-Gigabit Ethernet • 50-Gigabit Ethernet • 100-Gigabit Ethernet • 200-Gigabit Ethernet • IEEE 802.3x • IEEE 802.1q (formerly 802.1ad) VLAN • IEEE 802.1p • IEEE 802.1Qaz • IEEE 802.1Qbb • IEEE 802.3cd • IEEE 802.3ba, 802.3bj, 802.3bm • IEEE 802.3by • IEEE 802.3ae, 802.3ap • Prestandard IEEE 802.1BR • Jumbo frames up to 9KB • SCSI-FCP • T11 FCoE • PCI Express Gen 3 and Gen 4
Components	Cisco UCS custom Application-Specific Integrated Circuit (ASIC)
Connectivity	PCIe 4.0x16 form factor (PCIe, mLOM and mezz)
Performance	10/25/40/50/100/200-Gbps per port
Management	<p>Software release:</p> <p>Cisco VIC 15230: Minimum UCSM/IMM release is 4.3(2c).</p> <p>Cisco VIC 15231: Recommended IMM release is 4.2(2) or later that</p>

Items	Specifications
	<p>contains VIC firmware 5.2(2)</p> <p>Cisco VIC 15427: Minimum UCSM/IMM release is 4.3(2c).</p> <p>Cisco VIC 15428: Recommended UCSM release and IMM release is 4.2(2) or later that contains VIC firmware 5.2(2) or later, and recommended standalone CIMC release is 4.2(2). Review note under Table 2 for minimum version required.</p> <p>Cisco VIC 15411: Recommended UCSM/IMM release is 4.2(3) or later that contains VIC firmware 5.2(3)</p> <p>Cisco VIC 15237: Minimum UCSM/IMM release is 4.3(2c).</p> <p>Cisco VIC 15238: Recommended UCSM release and IMM release is 4.2(3) or later that contains VIC firmware 5.2(3) or later, and recommended standalone CIMC release is 4.2(3). Review note under Table 2 for minimum version required.</p> <p>Cisco VIC 15420 and 15422: Recommended IMM release is 4.3(1) or later</p> <p>Cisco VIC 15235 and 15425: Recommended UCSM release and IMM release is 4.3(2) or later, and recommended standalone CIMC release is 4.3(2) or later.</p>
<p>Supported switches with VIC 15425, 15427, and 15428</p>	<p>Cisco fabric interconnects and Cisco Nexus switches (from 4.2.3 for 15425/15428, 4.3.2 for 15427):</p> <ul style="list-style-type: none"> • Cisco UCS FI-6536 • Cisco UCS-FI-64108 • Cisco UCS-FI-6454 • Cisco UCS-FI-6332-16UP • Cisco UCS-FI-6332 • Cisco Nexus 93180YC-FX3 in FEX mode • Cisco Nexus 2348UPQ • Cisco Nexus 36180YC-R • Cisco Nexus 9336C-FX2 • Cisco Nexus 93360YC-FX2 • Cisco Nexus 9316D-GX • Cisco Nexus 93180YC-EX • Cisco Nexus 93180YC-FX • Cisco Nexus 93240YC-FX2 • Cisco Nexus 93108TC-FX (qualified with SFP-10G-T-X) • Cisco Nexus 93108TC-EX (qualified with SFP-10G-T-X) • Catalyst C9500X-60L4D Switch (with 4.3.4 and SFP-50G-CUxM cables) • Cisco Nexus 93400LD-H1 (with 4.3.5 and SFP-50G-CUxM cables)^[18]
<p>Supported switches with VIC 15235, 15237, and 15238</p>	<p>Cisco fabric interconnects and Cisco Nexus switches (from 4.2.3 for 15235/15238, 4.3.2 for 15237)</p> <ul style="list-style-type: none"> • Cisco UCS-FI-6536 • Cisco UCS-FI-6332-16UP

Items	Specifications
	<ul style="list-style-type: none"> • Cisco UCS-FI-6332 • Cisco Nexus 3232C • Cisco Nexus 9236C • Cisco Nexus 9332C • Cisco Nexus 9336C-FX2 • Cisco Nexus 9364C • Cisco Nexus 9336C-FX2-E • Cisco Nexus 93360YC-FX2 • Cisco Nexus 9316D-GX (with 4.3.5 and SFP-200G-SR4-S/SL4) • Cisco Nexus 93600CD-GX (with 4.3.5 and SFP-200G-SR4-S/SL4) • Cisco Nexus 9332D-GX2B (with 4.3.5 and SFP-200G-SR4-S/SL4)
Supported fabric interconnect and IFM with VIC 15230, 15231, 15420, and 15422	Cisco fabric interconnect switches and IOMs: <ul style="list-style-type: none"> • Cisco UCS FI-6536 • Cisco UCS-FI-64108 • Cisco UCS FI-6454 • Cisco UCSX-I-9108-25G • Cisco UCSX-I-9108-100G
Supported fabric interconnect and IOM with VIC 15411	Cisco fabric interconnect switches and IOMs (from 4.2.3) <ul style="list-style-type: none"> • Cisco UCS FI-6536 • Cisco UCS-FI-64108 • Cisco UCS FI-6454 • Cisco UCS-FI-6332-16UP • Cisco UCS-FI-6332 • Cisco UCS-IOM-2408 • Cisco UCS-IOM-2304v1/v2 • Cisco UCS-IOM-2208 • Cisco UCS-IOM-2204

Note: All the listed switches are validated against our transceivers/cables. Any switch that is not listed is expected to work but is not validated.

^[18] When using Nexus 93400LD-H1 and SFP-50G-CUxM cables, the VIC Admin AN/LT setting must be changed from the default “Auto” to “Off” for the link to come up.

Table 3. Cisco UCS VIC 15000 power and physical specification

Items	Specifications			
Power consumption	Cisco UCS VIC		Power consumption (max)	
	15427 and 15428		27.4W	
	15230 and 15231		24.8W	
	15237 and 15238		34.4W	
	15411		26.9W	
	15235		40.8W	
	15425		35.2W	
Physical dimensions	Cisco UCS VIC	Length	Width	Height
	15427 and 15428	6.60 in	2.5 in	0.53 in
	15230 and 15231	4.29 in	5.03 in	1.47 in
	15237 and 15238	6.28 in	3.94 in	0.74 in
	15411	5.85 in	3.4 in	0.94 in
	15235	7.17 in	2.35 in	0.85 in
	15425	7.17 in	2.35 in	0.85 in

Table 4. Cisco UCS VICs, fabric interconnect, IFM, FEX, and server support

Cisco UCS VIC	Cisco UCS servers, fabric interconnects, fabric extenders
15230 and 15231 dual-port 100G mLOM	X210c-M6/M7, X410c-M7, X215c-M8, FI 6536, FI 6454/64108, X9108-IFM-25G, X9108-IFM-100G
15420 quad-port 25G mLOM	X210c-M6/M7, X410c-M7, X215c-M8, FI 6536, FI 6454/64108, X9108-IFM-25G, X9108-IFM-100G
15422 quad-port 25G Mezz	X210c-M6/M7, X410c-M7, X215c-M8, FI 6536, FI 6454/64108, X9108-IFM-25G, X9108-IFM-100G
15427 and 15428 quad-port 10/25/50-Gbps mLOM 15425 quad-port 10/25/50-Gbps PCIe	C220 M6/M7, C240 M6/M7, C225 M6, C245 M6, C225 M8, C245 M8, FI 6536, FI 6454/64108, FI 6332/6332-16UP, 93180YC-FX3 in FEX-mode, 2348UPQ FEX
15411 dual-port 40G mLOM	B200-M6, FI 6536, FI 6454/64108, FI 6332/6332-16UP, IOM 2204/2208, IOM 2304, IOM 2408
15237 and 15238 dual-port 40/100/200-Gbps mLOM 15235 dual-port 40/100/200-Gbps PCIe	C220 M6/M7, C240 M6/M7, C225 M6, C245 M6, C225 M8, C245 M8, FI 6536, FI 6332/6332-16UP

Transceiver and cable support

The Cisco UCS VIC supports a wide variety of Ethernet connectivity options using Cisco 10/25/40/100-Gbps transceivers and Cisco 10/25/40/100-Gbps passive cables and active optical cables.

Third-party cables and transceivers are not supported on the Cisco UCS C-series VICs . If a third-party cable or transceiver is installed between a UCS C-series VIC and a fabric interconnect or Top-of-Rack (ToR) switch such as Cisco Nexus 9000 Series, the link will not come up. When connecting a UCS C-series VIC to a fabric interconnect or a ToR switch, only the supported transceivers and cables listed below should be used.

Table 5 lists the supported transceiver options.

Table 5. Cisco UCS VIC transceiver matrix

Product number	Description
SFP+ 10-Gbps transceivers⁽⁴⁾	
SFP-10G-T-X⁽³⁾	10GBASE-T, copper, 30m
SFP-10G-SR	10GBASE-SR, 850 nm, MMF, 300m
SFP-10G-SR-S	10GBASE-SR, 850 nm, MMF, 300m, S-Class
SFP-10G-LR	10GBASE-LR, 1310 nm, SMF, 10 km
SFP-10G-LR-S	10GBASE-LR, 1310 nm, SMF, 10 km, S-Class
SFP28 25-Gbps transceivers⁽⁷⁾	
SFP-25G-SR-S^(1,6)	25GBASE-SR SFP28 module for MMF
SFP-25G-SL^(5,6)	25GBASE-SL SFP28 module for MMF
SFP-10/25G-CSR-S^(1,6)	10/25GBASE-CSR SFP28 module for MMF
SFP-10/25G-LR-S^(2,6)	10/25GBASE-LR SFP28 module of SMF
QSFP 40-Gbps transceivers	
QSFP-40G-SR4	40GBASE-SR4 QSFP transceiver module with MPO connector
QSFP-40G-SR4-S	40GBASE-SR4 QSFP transceiver module, MPO connector, enterprise class
QSFP-40G-CSR4	40GBASE-CSR4, 4 lanes, 850 nm MMF, MPO
QSFP-40G-CSR-S	40GBASE-SR-, duplex MMF, LC
QSFP-40G-SR-BD	40GBASE-SR-BiDi, duplex MMF (LC)
QSFP-40G-LR4	QSFP 40GBASE-LR4 OTN transceiver, LC, 10KM
QSFP-40G-LR4-S	40GBASE-LR, 1310 nm, SMF, 10 km, S-Class
QSFP 100-Gbps transceivers	
QSFP-100G-SR4-S	100GBASE SR4 QSFP transceiver, MPO, 100m over OM4 MMF

Product number	Description
QSFP-100G-SL4	100GBASE QSFP Short Link Transceivers, 30M reach over OM4 MMF, MPO
QSFP-40/100-SRBD	100GBASE/40GBASE SR-BiDi QSFP transceiver, LC, 100m over OM4 MMF
QSFP-100G-SR1.2⁽⁸⁾	100G SR-BiDi QSFP Transceiver, LC, 100m OM4 MMF, LC
QSFP-100G-LR4-S	100GBASE LR4 QSFP transceiver, LC, 10KM over SMF
QSFP-100G-DR-S	100GBASE DR QSFP Transceiver, 500m over SMF, LC
QSFP-100G-FR-S	100GBASE FR QSFP Transceiver, 2km over SMF, LC
QSFP-100G-SM-SR	100GBASE CWDM4 Lite QSFP Transceiver, 2km over SMF, 10-60C, LC
QSFP-100G-CWDM4-S⁽¹³⁾	100GBASE CWDM4 QSFP Transceiver, LC, 2km over SMF
QSFP-100G-PSM4-S⁽¹⁴⁾	100GBASE PSM4 QSFP Transceiver, MPO, 500m over SMF
QSFP56 200-Gbps transceivers	
QSFP-200G-SR4-S	200G QSFP56 Transceiver, MPO-12, 100m OM4 MMF, 200GBASE-SR4 compliant.
QSFP-200G-SL4	200G QSFP56 Transceiver, MPO-12, 30m (OM4 MMF).

Note:

- ⁽¹⁾ SFP-10/25G-CSR-S is supported only at 25G for Intersight managed and UCSM managed servers. Interoperability between SFP-25G-SR-S and SFP-10/25G-CSR-S (at 25G) is supported on VIC 15425, 15427, and 15428. For Cisco IMC managed servers, both 10G and 25G speeds are supported from IMC release 4.3(6) onward.
- ⁽²⁾ SFP-10/25G-LR-S is supported at 25G only for Intersight managed and UCSM managed servers. Interoperability between SFP-25G-LR-S and SFP-10/25G-LR-S (at 25G) is supported on VIC 15425, 15427, and 15428. For Cisco IMC managed servers, both 10G and 25G speeds are supported from IMC release 4.3(6) onward.
- ⁽³⁾ SFP-10G-T-X transceiver is supported at 10G speed with VIC 15425, 15427, and 15428 on ports 2 and 4 when in standby power. When the server is fully powered on, SFP-10G-T-X transceiver is enabled for all 4 ports. If user intends to mix cable types on these VICs along with SFP-10G-T-X, ports 1 and 3 can support only passive copper cables (10/25G-CUx). The 10GBase-T connections are not supported when the VIC is connected to a Fabric Interconnect.
- ⁽⁴⁾ 10G connectivity from VIC 15425, 15427, and 15428 is supported with UCS fabric interconnect 6300/6400 series and standalone switches. UCS-FI-6536 does not currently support 10-Gbps connectivity to these VICs.
- ⁽⁵⁾ SFP-25G-SL is supported with UCS-FI-6536.
- ⁽⁶⁾ FI 6536 with QSA28 (CVR-QSFP28-SFP28) on server-port supports connectivity with VIC14528 using the following SFP28 transceiver. This connectivity is supported with UCS-FI-6536 from IMM Release 4.2(2).
- ⁽⁷⁾ 25G connectivity from VIC 15425, 15427, and 15428 is supported with UCS fabric interconnect 6400/6500 series, 93180YC-FX3 in Fex mode and 93180YC-FX/93360YC-FX2 standalone switches.
- ⁽⁸⁾ Supported in standalone mode with 4.3(1).
- ⁽¹³⁾ Supported in standalone mode with 4.3.4.240152.
- ⁽¹⁴⁾ Cisco VID V02 and higher is supported. With UCS-FI-6536 for 100G and 4x25G mode with Management versions from 4.3.4. Supported in standalone mode from 4.3.4.240152.

VIC 15235, 15237, and 15238 support 200-Gbps capability, and with version 4.3.5, the supported 200-Gbps transceivers above are supported on the listed switches.

If 100-Gbps or 200-Gbps speeds are used on a 200-Gbps-capable VIC, both ports must be either 100-Gbps or 200-Gbps. If one port is configured at 40-Gbps, the other port can be any of the three speeds.

Qualified transceiver optical breakout using 3rd party MPO-4xLC fiber breakout cable

- SFP-10G-SR to QSFP-40G-SR4 in 4x10G breakout mode with fabric-interconnect and standalone switches.
- SFP-10G-SR to QSFP-40G-CSR4 in 4x10G breakout mode with fabric-interconnect and standalone switches.
- SFP-10G-LR-S to QSFP-4x10G-LR-S in 4x10G breakout mode with standalone switches.
- SFP-25G-SR-S to QSFP-100G-SR4-S in 4x25G mode breakout mode fabric-interconnect and standalone switches.
- SFP-10/25G-CSR-S to QSFP-100G-SR4-S in 4x25G mode breakout mode fabric-interconnect and standalone switches.
- SFP-10/25G-LR-S to QSFP-100G-PSM4-S in 4x25G mode breakout mode with standalone switches.
- SFP-25G-SL to QSFP-100G-SL4 in 4x25G mode breakout mode with 6536 fabric-interconnect.

Qualified cables for immersion cooling environments with C-Series servers

For customers using immersion cooling with C-Series servers, Cisco does not sell immersion-specific cables. We have qualified the following immersion cooling cables for use with 4th generation Fabric Interconnects and 25G VIC adapters.

- 10GTek LIQ-AOC-S4S4-xxx (850-nm OM3 cables) in 2m, 7m, and 10m lengths have been qualified as of 4.3(6) release

Table 6. Cisco UCS VIC cable support matrix

Product number	Description
SFP+ 10-Gbps cables with integrated transceivers⁽⁴⁾	
SFP-H10GB-CU1M	10GBASE-CU SFP+ direct-attached copper cable, 1M
SFP-H10GB-CU1-5M	10GBASE-CU SFP+ direct-attached copper cable, 1.5M
SFP-H10GB-CU2M	10GBASE-CU SFP+ direct-attached copper cable, 2M
SFP-H10GB-CU2-5M	10GBASE-CU SFP+ direct-attached copper cable, 2.5M
SFP-H10GB-CU3M⁽⁹⁾	10GBASE-CU SFP+ direct-attached copper cable, 3M
SFP-H10GB-CU5M⁽⁹⁾	10GBASE-CU SFP+ direct-attached copper cable, 5M
SFP-H10GB-ACU7M⁽⁹⁾	10GBASE-CU SFP+ direct-attached active copper cable, 7M
SFP-H10GB-ACU10M	10GBASE-CU SFP+ direct-attached active copper cable, 10M
SFP-10G-AOC1M	10GBASE active optical SFP+ cable, 1M
SFP-10G-AOC2M	10GBASE active optical SFP+ cable, 2M

Product number	Description
SFP-10G-AOC3M⁽⁹⁾	10GBASE active optical SFP+ cable, 3M
SFP-10G-AOC5M⁽⁹⁾	10GBASE active optical SFP+ cable, 5M
SFP-10G-AOC7M	10GBASE active optical SFP+ cable, 7M
SFP-10G-AOC10M	10GBASE active optical SFP+ cable, 10M
SFP28 25-Gbps cables with integrated transceivers⁽⁷⁾	
SFP-H25G-CU1M	25GBASE-CU SFP28 direct-attached copper cable, 1M
SFP-H25G-CU2M	25GBASE-CU SFP28 direct-attached copper cable, 2M
SFP-H25G-CU3M⁽¹⁰⁾	25GBASE-CU SFP28 direct-attached copper cable, 3M
SFP-H25G-CU4M	25GBASE-CU SFP28 direct-attached copper cable, 4M
SFP-H25G-CU5M⁽¹⁰⁾	25GBASE-CU SFP28 direct-attached copper cable, 5M
SFP-25G-AOC1M	25GBASE-AOC SFP28 active optical cable, 1M
SFP-25G-AOC2M	25GBASE-AOC SFP28 active optical cable, 2M
SFP-25G-AOC3M⁽¹⁰⁾	25GBASE-AOC SFP28 active optical cable, 3M
SFP-25G-AOC4M	25GBASE-AOC SFP28 active optical cable, 4M
SFP-25G-AOC5M⁽¹⁰⁾	25GBASE-AOC SFP28 active optical cable, 5M
SFP-25G-AOC7M	25GBASE-AOC SFP28 active optical cable, 7M
SFP-25G-AOC10M	25GBASE-AOC SFP28 active optical cable, 10M
QSFP 40-Gbps cables with integrated transceivers⁽¹¹⁾	
QSFP-4x10G-AC7M	40GBASE-CR4 QSFP+ to 4x10GBASE-CU SFP+ active direct-attach breakout cable, 7M
QSFP-4x10G-AC10M	40GBASE-CR4 QSFP+ to 4x10GBASE-CU SFP+ active direct-attach breakout cable, 10M
QSFP-4SFP10G-CU1M	40GBASE-CR4 QSFP+ to 4x10GBASE-CU SFP+ passive direct-attach cable, 1M
QSFP-4SFP10G-CU3M	40GBASE-CR4 QSFP+ to 4x10GBASE-CU SFP+ passive direct-attach cable, 3M
QSFP-4SFP10G-CU5M	40GBASE-CR4 QSFP+ to 4x10GBASE-CU SFP+ passive direct-attach cable, 5M
QSFP-4X10G-AOC1M	40GBASE-active optical QSFP to 4xSFP+ active optical breakout cable, 1M
QSFP-4X10G-AOC2M	40GBASE-active optical QSFP to 4xSFP+ active optical breakout cable, 2M
QSFP-4X10G-AOC3M	40GBASE-active optical QSFP to 4xSFP+ active optical breakout cable, 3M
QSFP-4X10G-AOC5M	40GBASE-active optical QSFP to 4xSFP+ active optical breakout cable, 5M

Product number	Description
QSFP-4X10G-AOC7M	40GBASE-active optical QSFP to 4xSFP+ active optical breakout cable, 7M
QSFP-4X10G-AOC10M	40GBASE-active optical QSFP to 4xSFP+ active optical breakout cable, 10M
QSFP-H40G-CU1M	40GBASE-CR4 passive copper cable, 1M
QSFP-H40G-CU3M	40GBASE-CR4 passive copper cable, 3M
QSFP-H40G-CU5M	40GBASE-CR4 passive copper cable, 5M
QSFP-H40G-ACU7M	40GBASE-CR4 active copper cable, 7M
QSFP-H40G-ACU10M	40GBASE-CR4 active copper cable, 10M
QSFP-H40G-AOC1M	40GBASE active optical cable, 1M
QSFP-H40G-AOC2M	40GBASE active optical cable, 2M
QSFP-H40G-AOC3M	40GBASE active optical cable, 3M
QSFP-H40G-AOC5M	40GBASE active optical cable, 5M
QSFP-H40G-AOC7M	40GBASE active optical cable, 7M
QSFP-H40G-AOC10M	40GBASE active optical cable, 10M
QSFP-H40G-AOC15M	40GBASE active optical cable, 15M
SFP56 50-Gbps cables with integrated transceivers⁽¹⁵⁾	
SFP-50G-CU1M	25/50GBASE-CR1 SFP56 Copper Cable 1-meter, LSZH
SFP-50G-CU1.5M	25/50GBASE-CR1 SFP56 Copper Cable 1.5-meter, LSZH
SFP-50G-CU2M	25/50GBASE-CR1 SFP56 Copper Cable 2-meter, LSZH
SFP-50G-CU2.5M	25/50GBASE-CR1 SFP56 Copper Cable 2.5-meter, LSZH
SFP-50G-CU3M	25/50GBASE-CR1 SFP56 Copper Cable 3-meter, LSZH
SFP-50G-CU4M	25/50GBASE-CR1 SFP56 Copper Cable 4-meter, LSZH
SFP-50G-CU5M	25/50GBASE-CR1 SFP56 Copper Cable 5-meter, LSZH
QSFP 100-Gbps cables with integrated transceivers⁽¹⁶⁾	
QSFP-4SFP25G-CU1M	100GBASE QSFP to 4xSFP25G passive copper splitter cable, 1M
QSFP-4SFP25G-CU2M	100GBASE QSFP to 4xSFP25G passive copper splitter cable, 2M
QSFP-4SFP25G-CU3M	100GBASE QSFP to 4xSFP25G passive copper splitter cable, 3M
QSFP-4SFP25G-CU5M	100GBASE QSFP to 4xSFP25G passive copper splitter cable, 5M

Product number	Description
QSFP-100G-CU1M	100GBASE-CR4 passive copper cable, 1M
QSFP-100G-CU2M	100GBASE-CR4 passive copper cable, 2M
QSFP-100G-CU3M	100GBASE-CR4 passive copper cable, 3M
QSFP-100G-CU5M	100GBASE-CR4 passive copper cable, 5M
QSFP-100G-AOC1M	100GBASE QSFP active optical cable, 1M
QSFP-100G-AOC2M	100GBASE QSFP active optical cable, 2M
QSFP-100G-AOC3M	100GBASE QSFP active optical cable, 3M
QSFP-100G-AOC5M	100GBASE QSFP active optical cable, 5M
QSFP-100G-AOC7M	100GBASE QSFP active optical cable, 7M
QSFP-100G-AOC10M	100GBASE QSFP active optical cable, 10M
QSFP-100G-AOC15M	100GBASE QSFP active optical cable, 15M
QSFP-100G-AOC20M	100GBASE QSFP active optical cable, 20M
QSFP-100G-AOC25M	100GBASE QSFP active optical cable, 25M
QSFP-100G-AOC30M	100GBASE QSFP active optical cable, 30M

Note:

⁽⁹⁾ Support also includes Nexus 93180YC-EX and 93240YC-FX2 with Cisco IMC Release 4.2(2).

⁽¹⁰⁾ Support also included Nexus 36180YC-R, 93180YC-EX, and 93240YC-FX2 with Cisco IMC Release 4.2(2).

⁽¹¹⁾ 10G connectivity from VIC 15425/15427/15428 with 4x10G/4SFP10G cables is supported with UCS fabric interconnect 6300/6400 series. UCS-FI-6536 does not currently support 10-Gbps connectivity to UCS VIC 15425/15427/15428.

⁽¹⁵⁾ Supported only for default rate of 50Gbps only, with Cisco Catalyst C9500X-60L4D Switch in standalone mode from 4.3(4).

⁽¹⁶⁾ 25G connectivity from VIC 15425/15427/15428 with 4SFP25G cables is supported with UCS fabric interconnect 6400/6500 series along with 93180YC-FX, 93360YC-FX2, 9336C-FX2, and 9316D-GX standalone switches.

Ordering information

Table 7 presents ordering information for the Cisco UCS VIC 15000 Series.

Table 7. Ordering information

Part number	Description
UCSX-ML-V5D200G⁽¹⁷⁾	Cisco UCS VIC 15231 2x100G mLOM for Cisco UCS X210c M6 Compute Node
UCSX-ML-V5Q50G	UCS VIC 15420 4x25G mLOM for Cisco UCS X210c-M6 Compute Node
UCSX-ME-V5Q50G	UCS VIC 15422 4x25G mezz for Cisco UCS X210c-M6 Compute Node
UCSX-V5-BRIDGE	UCS VIC 15000 bridge connector for VIC 15420 mLOM and VIC 15422 mezz in an X210c M6 Compute Node
UCSC-M-V5Q50G⁽¹⁷⁾	Cisco UCS VIC 15428 Quad port 10/25/50G mLOM for C220-M6, C240-M6, C225-M6, C245-M6
UCSC-M-V5D200G⁽¹⁷⁾	Cisco UCS VIC 15238 Dual port 40/100/200G mLOM for C220-M6, C240-M6, C225-M6, C245-M6
UCSB-ML-V5Q10G	Cisco UCS VIC 15411 mLOM for Cisco UCS B-Series M6 Blade Server
UCSC-P-V5Q50G	Cisco UCS VIC 15425 Quad port 10/25/50G PCIe for Cisco UCS C-Series M6 rack servers
UCSC-P-V5D200G	Cisco UCS VIC 15235 Dual port 40/100/200G PCIe for Cisco UCS C-Series M6 rack servers
UCSX-ML-V5D200G-D⁽¹⁷⁾	Cisco UCS VIC 15231 2x100G mLOM for Cisco UCS X210c-M7 and X410c-M7 Compute Node
UCSX-ML-V5Q50G-D	UCS VIC 15420 4x25G mLOM for Cisco UCS X210c-M7, X410c-M7, and X215c-M8 Compute Nodes
UCSX-ME-V5Q50G-D	UCS VIC 15422 4x25G mezz for Cisco UCS X210c-M7, X410c-M7, and X215c-M8 Compute Nodes
UCSX-V5-BRIDGE-D	UCS VIC 15000 bridge connector for VIC 15420 mLOM and VIC 15422 mezz in X210c-M7, X410c-M7, and X215c-M8 Compute Nodes
UCSC-M-V5Q50G-D⁽¹³⁾	Cisco UCS VIC 15428 Quad port 10/25/50G mLOM for C220-M7, C240-M7
UCSC-M-V5D200G-D⁽¹³⁾	Cisco UCS VIC 15238 Dual port 40/100/200G mLOM for C220-M7, C240-M7
UCSC-P-V5Q50G-D	Cisco UCS VIC 15425 Quad port 10/25/50G PCIe for Cisco UCS C-Series M7/M8 rack servers
UCSC-P-V5D200G-D	Cisco UCS VIC 15235 Dual port 40/100/200G PCIe for Cisco UCS C-Series M7/M8 rack servers
UCSC-M-V5D200GV2	Cisco UCS VIC 15237 Dual port 40/100/200G mLOM for UCS C-Series M6 rack servers
UCSC-M-V5D200GV2D	Cisco UCS VIC 15237 Dual port 40/100/200G mLOM for UCS C-Series M7/M8 rack servers

Part number	Description
UCSC-M-V5Q50GV2	Cisco UCS VIC 15427 Quad port 10/25/50G mLOM for Cisco UCS C-Series M6 rack servers
UCSC-M-V5Q50GV2D	Cisco UCS VIC 15427 Quad port 10/25/50G mLOM for Cisco UCS C-Series M7/M8 rack servers
UCSX-ML-V5D200GV2	Cisco UCS VIC 15230 2x100G mLOM for Cisco UCS X-Series M6 Compute Nodes
UCSX-ML-V5D200GV2D	Cisco UCS VIC 15230 2x100G mLOM for Cisco UCS X-Series M7/M8 Compute Nodes

Note: When ordering Cisco UCS VIC 15000 Series, the part numbers with "-D" suffix are ordering PIDs specific to UCS M7 and M8 servers, and the PIDs without "-D" apply to UCS M6 servers. There is no difference in functionality and operation for VICs with and without "-D".

⁽¹⁷⁾ VIC 15231, 15238, and 15428 have been replaced by 15230, 15237, and 15427 respectively. The 15231, 15238, and 15428 adapters will not be sold after July 27, 2024, but will continue to be supported under applicable Cisco support contracts. These adapters are not supported on M8 generation servers.

System requirements

The Cisco UCS VIC 15000 Series is designed for use on Cisco UCS X-Series M6/M7/M8 servers, B-series M6 blade servers, and C-series M6/M7/M8 rack servers.

Warranty information

Find warranty information at Cisco.com on the [Product Warranties](#) page.

Product sustainability

Information about Cisco's Environmental, Social, and Governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability [reporting](#).

Table 8. Cisco environmental sustainability information

Sustainability topic		Reference
General	Information on product-material-content laws and regulations	Materials
	Information on electronic waste laws and regulations, including our products, batteries, and packaging	WEEE Compliance
	Information on product takeback and reuse program	Cisco Takeback and Reuse Program
	Sustainability inquiries	Contact: csr_inquiries@cisco.com
	Standards	Table 2. Product specifications
Power	Power consumption	Table 3. Power Consumption
Material	Product packaging weight and materials	Contact: environment@cisco.com

Sustainability topic	Reference
Physical dimensions	Table 3. Physical Dimensions

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 unified computing architecture. Cisco Unified Computing Services help you quickly deploy your data center resources, simplify ongoing operations, and optimize your infrastructure to better meet your business needs. For more information about these and other Cisco Data Center Services, visit <https://www.cisco.com/go/unifiedcomputingservices>

Why Cisco?

The Cisco Unified Computing System continues Cisco’s long history of innovation in delivering integrated systems for improved business results based on industry standards and using the network as the platform. Recent examples include IP telephony, LAN switching, unified communications, and unified I/O. Cisco began the unified computing phase of our unified data center strategy several years ago by assembling an experienced team from the computing and virtualization industries to augment our own networking and storage access expertise. As a result, Cisco delivered foundational technologies, including the Cisco Nexus Family, supporting unified fabric and server virtualization. Cisco UCS completes this phase, delivering innovation in architecture, technology, partnerships, and services. Cisco is well positioned to deliver this innovation by taking a systems approach to computing that unifies network intelligence and scalability with innovative ASICs, integrated management, and standard computing components.

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For more information

For more information about Cisco UCS, visit <https://www.cisco.com/en/US/products/ps10265/index.html>.

Document history

New or revised topic	Described in	Date
Added new transceiver matrix	Where applicable	October 20, 2022
Added PCIe VIC cards	Where applicable	June 1, 2023
Added new supported device details	Where applicable	June 23, 2023
Added X410c compute node support	Where applicable	September 12, 2023
Updates for new VIC models	Where applicable	October 1, 2023
VIC Secure Boot technology explanation	Table 1	July 1, 2024
VIC switch and cables/optics compatibility updates	Table 2 , Table 5 , Table 6	July 1, 2024
End of sale for non-Secure Boot VICs (15231, 15238, 15428)	Table 7	July 1, 2024
Additional supported cables and switches with 4.3(5) release	Where applicable	November 21, 2024

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