

Cisco 8800 Series Modular Routers

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Product overview

Cisco® 8800 Series Modular Routers combine the revolutionary Cisco Silicon One™ processor and innovative Cisco IOS® XR software to deliver highly scalable, high-performance routing capabilities with high port density and deep buffers, wire-speed encryption, routed optical networking [RON](#) readiness with ZR/ZR+ coherent optics, real-time state streaming, and analytics. Available in 4-, 8-, 12-, and 18-slot chassis, these flexible, versatile, and modular routing platforms cater to a wide variety of WAN use cases with IOS XR, including core, peering, data center interconnect, and high-capacity aggregation, as well as data center use cases with [SONiC](#), including data center fabric and AI/ML networking. With the introduction of the P100-based 28.8-Tbps Line Card (LC), the 8800 modular routers deliver twice the system capacity of Q200 based modular LCs with an industry-leading port density of 36x 800G per slot, as well as 72x 400G in dense 400G deployments.

Silicon innovations power the next generation of routers

Cisco [Silicon One](#) is the first breakthrough networking chip that enables a single silicon architecture and single SDK to deploy anywhere in the network faster and more simply. Designed for both switching and routing, fixed and modular form factors, it can handle some of the most challenging networking applications across all segments.

Cisco Silicon One is the first routing silicon architecture to break through the 10-Tbps benchmark for network bandwidth. This is accomplished without sacrificing route capacity, forwarding performance, or feature flexibility. The first-generation Q100 delivered 10.8 Tbps of throughput in 16-nm process technology, while the second-generation Q200 increased the performance to 12.8 Tbps in 7-nm process technology. The third-generation P100, at 19.2 Tbps, with 100G PAM4 SerDes, provides the highest bandwidth, highest performance, most flexible, and most power-efficient routing silicon on the market.

Cisco IOS XR – Simple, modern, and trustworthy

Powered by Cisco IOS XR Release 7 (XR7), the networking operating system has consistently evolved to meet these technological transitions. IOS XR brings with it best-in-class routing protocols and features, and the continued focus on intent-based transport technologies such as segment routing and Ethernet Virtual Private Networking (EVPN) has made IOS XR the leading choice for web scale and large-scale service providers across network segments. IOS XR supports unique configurations, improves operational flexibility, and enhances security, enabling network engineers to efficiently manage and operate a fast, reliable, and flexible network that can cope with unprecedented traffic growth and provide the services and performance that customers demand.

Modernizing XR7 with installation procedures using standard Linux software package managers has also improved operations. Instead of “one size fits all,” XR7 provides modularity so that customers load only what they will use. Customers can easily access new software packages from trusted Cisco RPM Package Manager repositories. Alternatively, they can build their own repository of both Cisco and custom software packages, which can be fetched for final system configuration without spending time trying to sort out software dependencies. All required Cisco software packages, home-grown and third-party software packages, and router configurations can be pulled into a single Cisco software image known as a Golden ISO. Customized images can be installed consistently and with confidence across devices in the network.

Detailed information on XR7 can be found in the [IOS XR Data Sheet](#).

Key features and benefits

Table 1. 8800 series features and benefits

Feature	Description	Benefits
System capacity and scalability	<ul style="list-style-type: none"> Modular design, available in 4-, 8-, 12-, and 18-slot chassis supports up to 28.8 Tbps per slot with third-generation fabric cards. The P100-based line card enables 36 ports of 800G QSFP-DD800 and can enable up to 72 of 400G or 288 of 100G per line card with breakout options. The Q200 line card provides 36 ports of 400G QSFP56-DD, which can also enable up to 144 ports of 100G/25G/10G with breakout options or up to 36 ports of 40G 	<p>Network operators gain the bandwidth, density, and scale needed to outpace increasing traffic demands.</p> <p>Enables greater savings by reducing the number of routers (and optics) required.</p>
High performance	Groundbreaking Silicon One innovation powers the 8800 Series with unparalleled packet processing leveraging powerful memory architecture.	Exceptional packet processing capabilities help alleviate the challenge of scaling the network as traffic increases while optimizing functionality for superior performance and seamless deployment.
Advanced security	<ul style="list-style-type: none"> Enhances the security posture of your network by helping you measure, audit, verify, and enforce the trustworthiness of your network infrastructure. With a hardware-anchored root of trust, IOS XR security features, and remote security attestation, you can establish device integrity from boot time to run time. These features can help prevent the execution of unvalidated or malicious software across your network. 	Provides robust, integrated security features that protect the network from threats, helping ensure data integrity and compliance with regulatory requirements.
High availability (HA)	<ul style="list-style-type: none"> The 8800 Series is designed with full hardware redundancy for cooling, power supply, route processors (RPs), and switch fabric. IOS XR supports graceful RP failover. 	HA is a critical requirement for maintaining an always-on infrastructure to meet stringent Service-Level Agreements (SLAs) across the core.
Energy efficiency	System design incorporates advanced thermal telemetry that supports dynamic fan control algorithms to drive lower power consumption.	Enables a substantial positive environmental impact and cost savings.
Investment protection	Backward compatible with previous generation, as well as ready for future expansion to higher-speed ports and bandwidth.	Reduces Total Cost of Ownership (TCO).



Figure 1.
The Cisco 8800 Series Modular Routers

Key components

Available in 4, 8, 12, and 18 slots, all models support a common set of Route Processors (RPs), fans, Power Supply Units (PSUs), and line cards. Power tray and PSU are located on top, RP and line card modules plug in from the front, fabric and fan modules are inserted from the rear. The system uses orthogonal design for direct connection from line cards to fabric modules. All components are hot swappable with redundant supervisor, power, fabric and cooling modules with front-to-rear airflow.

Route processors

The RP runs the Cisco network operating system—IOS XR. It handles control plane and chassis management and timing synchronization functions for the 8800 system. In addition, the RP performs route processing and distributes forwarding tables to the line cards. It also controls fans, alarms, and power supplies using an I2C communication link to each fan tray and power supply. The RP supports 1+1 redundancy, meaning there can be two RP cards in the modular system in active and hot standby modes. The standby RP takes over all control functions in case of active RP failure to maintain service continuity. Standby redundancy provides a higher level of reliability because the backup components are not subject to wear and tear during normal operation

RP2 is 2nd generation with enhanced CPU, memory and storage to support new applications and better performance efficiency.

Fabric card modules

The 8800 Series switch fabric is powered by eight fabric cards based on Silicon One. FC1 is third-generation fabric based on F100 with 100G PAM4 SerDes support and 28.8 Tbps per slot. FC0 is second-generation fabric based on Q200 with 56G SerDes support on a Q200/Q100 line card. FC is first-generation fabric based on Q100.

Fan modules

The fan trays are in front of the fabric cards and are accessible from the rear of the chassis. Hot air exhausts through the rear of the chassis and N+1 redundancy is supported.

Power supply modules

The 8800 Series routers are equipped with redundant and hot-swappable AC or DC power supplies with an internal variable-speed fan. HVAC/HVDC power modules operate in the input range of 180 VAC to 305 VAC (nominal input level of 200 to 240 VAC, 277 VAC) and 192 to 400 VDC (nominal 240 VDC, 380 VDC). The DC power supply accepts a nominal input voltage of 48V 100A DC, with an operational tolerance range of -40 to -75 VDC. The DC power supply can also be configured to accept voltage of 48V 60A.

Line card modules

The 8800 Series offers a broad choice of line cards based on Silicon One, with a choice of speed and density options optimized for 400G and dense 400G deployments, including the third-generation [36x 800G \(P100\)](#) line card and the second-generation 36x 400G and 36x 100G and 40G (Q200/Q100) line cards. Every 400G interface supports breakout options of 200 G, 100G, 40G, 25G, and 10G.

Product specifications

Table 2. 8800 series chassis specifications

8800 system	8804-SYS	8808-SYS	8812-SYS	8818-SYS
Route processor slots	2	2	2	2
Line card slots	4	8	12	18
Fabric module slots	8	8	8	8
Fan module slots	4	4	4	4
Power supply slots (max)	8	12	12	24
Dimensions (HxWxD)	17.5 x 17.45 x 33 in. 44.5 x 44.3 x 83.8 cm	28 x 17.45 x 33.73 in. 71.1 x 44.3 x 85.7 cm	36.75 x 17.45 x 35.43 in. 93.3 x 44.3 x 90.0 cm	57.75 x 17.45 x 35.43 in. 146.7 x 44.3 x 90.0 cm
Rack units	10	16	21	33
Weight (chassis only)	124 lb (56.36 kg)	162 lb (73 kg)	212 lb (96 kg)	283 lb (128 kg)
Weight (full system)	402 lb (183 kg)	658 lb (299 kg)	891 lb (404 kg)	1357 lb (615 kg)
Max throughput (with 400G LC)	57.6T	115.2T	172.8T	259.2T
Max throughput (with 400G LC)	57.6T	115.2T	172.8T	259.2T
Typical system power (with 400G LC)	4.2KW	9.3KW	16.3KW	22KW
Max throughput (with 800G LC)	115.2T	230.4T	345.6T	518.4T

Table 3. 8800 series route processor specifications

Route processor	8800-RP	8800-RP2 8800-RP2-S
Processor	4-core at 2.4 GHz	8-core at 2.7 GHz
System memory	32 GB DRAM	64 GB DRAM
SSD storage	128 GB	256 GB
RS-232 serial ports	1	1
Management ports	1 (RJ-45) + 1 SFP+ (1/10G)	1 (R-J45) + 2 SFP+ (1/10G)
USB 2.0 ports	2	1
USB 3.0 ports	0	1
Timing/ports	Class B, SyncE, 1588 TOD, 1PPS, 10 MHz	Class C, SyncE, 1588 TOD, 1PPS, 10 MHz, GNSS
Hardware trust module	Cisco Trust Anchor Module (TAM)	TAM, Trusted Platform Module (TPM)
Dimensions (HxWxD)	2.61 x 22.37 x 8.05 in. 66.3 x 56.8 x 20.4 cm	2.61 x 22.37 x 8.05 in. 66.3 x 56.8 x 20.4 cm
Weight	6 lb (2.72 kg)	6 lb (2.72 kg)
Chassis support	8804, 8808, 8812, 8818	8804, 8808, 8818

Table 4. 8800 series F100 fabric module specifications

Fabric modules	8808-FC1
Description	F100-based fabric modules Support 28.8T per LC slot
Redundancy	Graceful degradation
Dimensions (HxWxD)	19.47 x 1.83 x 11.47c in. 49.5 x 4.6 x 29.1 cm
Weight	18 lb (8.16 kg)
Chassis support	8808

Table 5. 8800 series Q200 fabric module specifications

Fabric modules	8804-FC0	8808-FC0	8818-FC0
Description	Q200-based fabric modules Support 14.4T per LC slot		
Redundancy	Support N+1		
Dimensions (HxWxD)	10.29 x 1.83 x 11.47 in. 26.1 x 4.6 x 29.1 cm	19.47 x 1.83 x 11.47 in. 49.5 x 4.6 x 29.1 cm	40.56 x 1.83 x 11.47 in. 103.0 x 4.6 x 29.1 cm
Weight	6.71 lb (3.04 kg)	12.29 lb (5.57 kg)	30.86 lb (14 kg)
Chassis support	8804	8808	8818

Table 6. 8800 series Q100 fabric module specifications

Fabric modules	8808-FC	8812-FC	8818-FC
Description	Q100-based fabric modules Support 14.4T per LC slot		
Redundancy	Support N+1		
Dimensions (HxWxD)	19.47 x 1.83 x 11.47 in. 49.5 x 4.6 x 29.1 cm	27.58 x 1.83 x 11.47 in. 70.1 x 4.6 x 29.1 cm	40.56 x 1.83 x 11.47 in. 103.0 x 4.6 x 29.1 cm
Weight	12.93 lb (5.86 kg)	19.71 lb (8.94 kg)	29.79 lb (13.51 kg)
Chassis support	8808	8812	8818

System compatibility

The 8800 Series supports interoperability of different generations of RPs, FCs, and LCs in the same chassis.

When a mix of Q100, Q200, and P100 line cards are inserted in the same chassis, IOS XR allows you to choose whether you want the line cards to operate in Q100 (default behavior), Q200, or P100 mode to be able to use the improved scale, higher capacity, and feature-rich capabilities of the newer line cards. For details, please see [Configuring the NPU compatibility mode](#).

Table 7. 8800 series FC0/FC1 system compatibility

Chassis	8804		8808			8818	
Route processor	8800-RP	8800-RP2	8800-RP	8800-RP2	8800-RP2	8800-RP	8800-RP2
Fabric card	8804-FC0	8804-FC0	8808-FC0	8808-FC0	8808-FC1	8818-FC0	8818-FC0
Line card	Q100, Q200 LC	Q200 LC	Q100, Q200 LC	Q200	Q200, P100 LC*	Q100, Q200 LC	Q200 LC

*Please reference the [P100 Line Card Data Sheet](#) for further details.

Table 8. 8800 series FC system compatibility

Chassis	8808	8812	8818
Route processor	8800-RP	8800-RP	8800-RP
Fabric card	8808-FC	8812-FC	8818-FC
Line card	Q100, Q200 LC	Q100, Q200 LC	Q100, Q200 LC

Environmental characteristics

Operating temperature	0° to 40° C (32° to 104°F)
Non-operating(storage) temperature	-40° to 70° C (-40° to 158°F)
Operating humidity	5% to 95% +- 2%
Storage (relative) humidity	5% to 95% +- 2%
Altitude	0 to 3000 m

Standards compliance

Regulatory compliance	Products are compliant with CE Markings according to directives 2004/108/EC and 2006/95/EC
Safety	AS/NZS 62368-1, 3rd edition CAN/CSA C22.2 No. 62368-1, 3rd edition EN 62368-1, 3rd edition GB 4943-2022 (IEC 62368-1, 3rd edition) EC 62368-1, 3rd edition with all country deviations UL 62368-1, 3rd edition UL 60950-1, 2nd Edition (NRTL only)
EMC standards (Emissions)	FCC 47CFR15, Class A AS/NZS CISPR 32, Class A EN55032, Class A CISPR 32, Class A ICES-003, Class A VCCI, Class A KS C 9832, Class A CNS-15936, Class A EN/IEC 61000-3-3/3-11 EN/IEC 61000-3-2/3-12

EMC standards (Immunity)	IEC/EN61000-4-2 Electrostatic Discharge Immunity IEC/EN61000-4-3 Radiated Immunity IEC/EN61000-4-4 EFT-B Immunity IEC/EN61000-4-5 Surge IEC/EN61000-4-6 Immunity to Conducted Disturbances IEC/EN61000-4-11 Voltage Dips, Short Interruptions, and Voltage Variations KS C 9835
EN standards	EN 300 386 Telecommunications Network Equipment (EMC) EN55032 Multimedia Equipment (Emissions) EN55035/CISPR 35 Multimedia Equipment (Immunity) EN61000-6-1 Generic Immunity Standard (Residential, Commercial, Light-Industrial) EN61000-6-2 Generic Immunity Standard (Industrial)
RoHS	Products are RoHS 6 compliant with exceptions for leaded Ball Grid Array (BGA) balls and lead press fit connectors.

Cisco Smart Licensing

Cisco Smart Licensing is a flexible and secure licensing model that provides you with an easier, faster, and more consistent way to purchase, activate, manage, renew, and upgrade software products across the Cisco portfolio and across your organization. And it's secure—you control what users can access. With Smart Licensing you get:

- **Easy activation:** Smart Licensing establishes a pool of software licenses that can be used across the entire organization—no more PAKs (product activation keys).
- **Unified management:** My Cisco Entitlements provides a complete view into all of your Cisco products and services in an easy-to-use portal, so you always know what you have and what you are using.
- **License flexibility:** Your software is not node-locked to your hardware, so you can easily use and transfer licenses as needed.

To retrieve your Smart Licenses, you will first need to set up a Smart Account on Cisco Software Central (software.cisco.com).

For a more detailed overview of Cisco Licensing, go to cisco.com/go/licensingguide.

Ordering information

System Bundles	
8804-SYS	Cisco 8000 4 slot system bundle, includes RP, Fabric, Power supplies, Accessories
8808-SYS	Cisco 8000 8 slot system bundle, includes RP, Fabric, Power supplies, Accessories
8812-SYS	Cisco 8000 12 slot system bundle, includes RP, Fabric, Power supplies, Accessories
8818-SYS	Cisco 8000 18 slot system bundle, includes RP, Fabric, Power supplies, Accessories
Components and Spares	
8808-FC	Cisco 8000 Q100 based Fabric card for 8 slot chassis
8812-FC	Cisco 8000 Q100 based Fabric card for 12 slot chassis
8818-FC	Cisco 8000 Q100 based Fabric card for 18 slot chassis
8804-FC0	Cisco 8000 Q200 based Fabric card for 4 slot chassis
8808-FC0	Cisco 8000 Q200 based Fabric card for 8 slot chassis
8818-FC0	Cisco 8000 Q200 based Fabric card for 18 slot chassis
8808-FC1	Cisco 8000 F100 based Fabric Cards for 8808
8804-FC1	Cisco 8000 F100 based Fabric Cards for 8804
8818-FC1	Cisco 8000 F100 based Fabric Cards for 8818
8800-RP	Cisco 8000 Router Processor
8800-RP2	Cisco 8000 Router Processor 2
8800-RP2-S	Cisco 8000 Router Processor 2 (sZTP default)
8804-FAN	Cisco 8000 Fan Modules for 4 slot chassis
8808-FAN	Cisco 8000 Fan Modules for 8 slot chassis
8812-FAN	Cisco 8000 Fan Modules for 12 slot chassis
8818-FAN	Cisco 8000 Fan Modules for 18 slot chassis
PSU4.8KW-DC100	4.8KW 48V 100A DC Power Supply
PSU6.3KW-HV	6.3KW AC/HVAC/HVDC Power Supply
PSU6.3KW-20A-HV	6.3KW AC/HVAC/HVDC Power Supply-20A
8800-INSTKIT	Cisco 8800 Installation Kit
8800-ADJ-RAIL	8800 Adjustable rail kit

System Bundles	
8800-RP-BLANK	Cisco 8800 Route Processor Blank Filler
8808-KIT	Cisco 8808 Power Shelf Bezel, Cosmetic Door Kit, and Filter
8808-CBLMFMT	Cisco 8808 Cable Management Kit
8808-RMBRKT	Cisco 8808 Rear Mounting Brackets
8804-KIT	Cisco 8804 Power Shelf Bezel, Cosmetic Door Kit, and Filter
8804-CBLMFMT	Cisco 8804 Cable Management Kit
8804-RMBRKT	Cisco 8804 Rear Mounting Brackets
8812-KIT	Cisco 8812 Power Shelf Bezel, Cosmetic Door Kit, and Filter
8812-CBLMFMT	Cisco 8812 Cable Management Kit
8812-RMBRKT	Cisco 8812 Rear Mounting Brackets
8818-KIT	Cisco 8818 Power Shelf Bezel, Cosmetic Door Kit, and Filter
8818-CBLMFMT	Cisco 8818 Cable Management Kit
8818-RMBRKT	Cisco 8818 Rear Mounting Brackets
Line Cards	
88-LC1-36EH	Cisco 8800 36x 800G QSFP-DD800 line card
88-LC1-12TH24FH-E	Cisco 8800 12xQSFP28-DD, 24xQSFP56-DD; 12Tbps Line card
88-LC1-52Y8H-EM	Cisco 8800 52x SFP28, 8x QSFP28, 4x QSFP56-DD, 3.7 Tbps line card
88-LC0-36FH	Cisco 8800 36x400GE QSFP56-DD Line Card
88-LC0-36FH-M	Cisco 8800 36x400GE QSFP56-DD Line Card with MACsec
88-LC0-34H14FH	Cisco 8800 48x100G or 34x100GE + 14x400GE QSFP28/DD LC

Product sustainability

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

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 inquires	Contact: csr_inquiries@cisco.com
Material	Product packaging weight and materials	Contact: environment@cisco.com

Warranty

Cisco products are backed by a Limited Warranty.

For details on warranty please visit the [Cisco Warranty Finder](#).

Service and support

Accelerate your deployment, performance, maintenance, and ROI for your Cisco 8000 Series-based infrastructure with Cisco Customer Experience (CX), offering a variety of options to assist you across the lifecycle.

Cisco CX uses an architecture-led approach to help you align your network infrastructure with your business goals and achieve long-term value.

Next, we can help you maintain continuity and minimize risk with Cisco Service Provider Base, Smart Net Total Care®, and Cisco Software Support Basic. So when minutes matter, you can get help fast for your network open architecture with 24/7 access to our expert hardware and software support engineers in the Cisco Technical Assistance Center.

Cisco Capital

Flexible payment solutions to help you achieve your objectives

Cisco Capital® makes it easier to get the right technology to achieve your objectives, enable business transformation and help you stay competitive. We can help you reduce the total cost of ownership, conserve capital, and accelerate growth. In more than 100 countries, our flexible payment solutions can help you acquire hardware, software, services and complementary third-party equipment in easy, predictable payments. [Learn more.](#)

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