Cisco 8800 Series P100 Based Line Cards

Contents

Cisco 8000 Overview

The Cisco® 8000 Series combines the revolutionary Cisco Silicon One™ processor, Cisco IOS® XR software, and a set of clean-sheet chassis to deliver a breakthrough in high-performance routers. In particular, the Cisco 8000 modular systems portfolio, ranging from 4 slots to 18 slots, provides the benefits of a flexible deployment size and can be tailored to multiple use cases ranging from high-speed performance core to metro aggregation while providing high system density up to 576x 400GbE ports and 2304x 100GbE ports per slot in the 8-slot chassis. The performance of the Cisco 8000 distributed systems goes hand in hand with the evolution of the line cards.

The latest third-generation P100 processor pushes the performance to 19.2 Tbps in 7-nm technology and delivers high-scale routing with deep buffering. P100 processor innovation helps the Cisco 8000 Series to expand the addressable use cases from core and peering in the network to high-scale aggregation services.

This data sheet introduces three new P100-based line cards and their capabilities. These line cards, along with third-generation fabric cards, deliver an industry-leading high density of 28.8 Tbps per slot in the distributed systems. These line cards support 800, 400, 100, 40, 25, and 10 GbE ports at line rate in any slot of a Cisco 8000 Series modular systems.

For more information regarding the Cisco Silicon One P100 processor, please visit the P100 data sheet.

Key benefits of Cisco 8000 Series modular systems powered by the Cisco Silicon One P100

Architectural innovation

Advanced 100GbE serializer/deserializer (SerDes) technology allows customers to double current 400GbE port densities and increase by 8-fold current 100GbE port densities in the same form factor, supporting 72x 400GbE and 288x 100GbE ports per slot.

Sustainability

Distributed systems have up to twice the space efficiency of other 400GbE chassis systems, with double the capacity in the same chassis footprint. With up to 68% power savings, the 800G systems can help customers meet their sustainability goals.

Business agility

Pay-as-you-grow flexible consumption model helps customers prepare their deployments for the future by right-sizing the network, adding capacity over time to better align to business outcomes.

Operational simplicity

With the latest enhancements in Cisco Crosswork® Network Automation, along with advanced visualization dashboards, services monitoring with actionable insights, and closed-loop network optimization, customers can enjoy consistent quality of experience in their services.

Features and benefits

Table 1. Features and benefits

Feature	Details
Industry-leading, carrier-class Cisco IOS XR Software	Modular, patchable, scalable, highly available, carrier-class proven operating system
Cisco pluggable interface	Compatible with a diverse range of optical modules, for optimal performance and flexibility: QSFP+, QSFP28, QSFP28-DD, QSFP56-DD, and QSFP-DD800
Integrated interfaces	Flexible port rate configuration: 400, 100, 40, 25, and 10 GbE Breakout support: 8x 100GbE, 2x 400GbE, 4x 100GbE, 2x 100GbE, 4x 25GbE, and 4x 10GbE Routed optical network architecture ready, supporting all types of 400GbE Cisco DCO optics
Software	• Cisco IOS XR Minimum Software Release ◦ 88-LC1-36EH supports 24.2.1 and beyond ◦ 88-LC1-12TH-24FH and 88-LC1-52Y8H-EM supports 24.3.1 and beyond enhanced automation for onboarding, service provisioning, monitoring, and closed loop network optimization. Programmable infrastructure with segment routing (SR, SRv6) and EVPN.

Line card types

88-LC1-36EH

The Cisco 88-LC1-36EH P100-based line card (Figure 1) provides 36 ports of QSFP-DD800 (high-density 400GbE and 100GbE), aggregating to a total bandwidth of 28.8 Tbps.

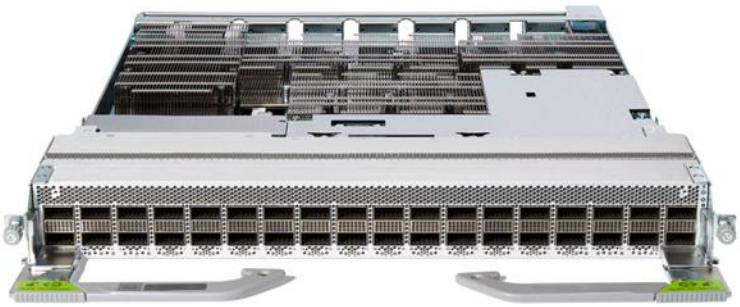

Figure 1.
The 88-LC1-36EH, 36x QSFP-DD800 P100-based line card

88-LC1-12TH24FH-E

The Cisco 88-LC1-12TH24FH-E P100-based line card (Figure 2) provides 12 ports of QSFP28-DD, and 24 ports of QSFP56-DD, providing an aggregate bandwidth of 12 Tbps.

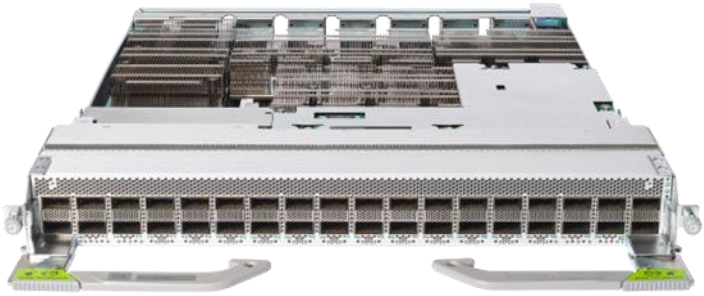

Figure 2.
The 88-LC1-12TH24FH-E, 12x QSFP28-DD, 24x QSFP56-DD P100-based line card

88-LC1-52Y8H-EM

The Cisco 88-LC1-52Y8H-EM is a P100-based MACSec-capable line card. The line card provides 52 ports of SFP28, 8 ports of QSFP28, and 4 ports of QSFP56-DD, aggregating to 3.7 Tbps in bandwidth.

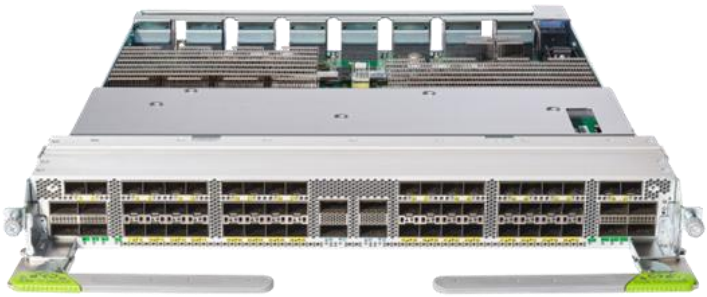

Figure 3.
The 88-LC1-52Y8H-EM, 52x SFP28, 8x QSFP28, 4x QSFP56-DD MACSec-capable line card

Product specifications

Table 2. Key specifications for the 88-LC1-36EH

Feature	Specifications
Product ID (PID)	88-LC1-36EH
Specifications	• 36 ports of QSFP-DD800 • 28.8 Tbps capacity • Dense 72x 400GbE or 288x 100GbE using breakout • 6-core x86 CPU, 64-GB DRAM, 256-GB SSD • Supports PTP timing with Class C performance • Routed optical network architecture ready, supporting all types of 400GbE Cisco DCO optics • Requires 8800-RP2 and 8808-FC1

Feature	Specifications
Physical specifications	• Height: 5.33 cm/2.10 in. • Width: 45.97 cm/18.10 in. • Length: 45.24 cm/17.81 in. • Weight: 12.70 kg/28 lb

Table 3. Key specifications for the 88-LC1-12TH24FH-E

Feature	Specifications
Product ID (PID)	88-LC1-12TH24FH-E
Specifications	• 12 ports of QSFP28-DD and 24 ports of QSFP56-DD • 12 Tbps capacity • 6-core x86 CPU, 64-GB DRAM, 256-GB SSD • Routed optical network architecture ready, supporting all types of 400GbE DCO optics • Supports PTP timing with Class C performance • Requires 8800-RP2 and 8808-FC1
Physical specifications	• Height: 5.33 cm/2.10 in. • Width: 45.97 cm/18.10 in. • Length: 45.24 cm/17.81 in. • Weight: 12.70 kg/28 lb

Table 4. Key specifications for the 88-LC1-52Y8H-EM

Feature	Specifications
Product ID	88-LC1-52Y8H-EM
Specifications	• 52 ports of SFP28, 8 ports of QSFP28, and 4 ports of QSFP56-DD • 3.7 Tbps capacity • 6-core x86 CPU, 64-GB DRAM, 256-GB SSD • Supports PTP timing with Class C performance • Supports MACsec on all ports • Routed optical network architecture ready, supporting all types of 400GbE DCO optics • Requires 8800-RP2 and 8808-FC1
Physical specifications	• Height: 5.33 cm/2.10 in. • Width: 45.97 cm/18.10 in. • Length: 45.24 cm/17.812 in. • Weight: 10.50 kg/23.15 lb

Compatibility

All P100 line cards require a new generation of router processors (8800-RP2) and 112GbE SerDes fabric cards (8808-FC1) to operate in 8808 distributed systems. The 88-LC1-12TH24FH-E and 88-LC1-52Y8H-EM line cards cannot coexist in the same system along with Q200-based line cards. Only the 88-LC1-36EH line card can coexist with Q200 line cards in the same system in Q200 mode.

Table 5. System requirements

Hardware PIDs	Product description
8800-RP2	Cisco 8800 Router Processor 2
8808-FC1	Cisco 8808 3rd Gen Fabric Card for 8808

System Management Configuration Guide for Cisco 8000 Series Routers.

Environmental properties

Table 6. Environmental properties

Property	Specification
Operating temperature	0° to 40°C (32° to 104°F)
Nonoperating(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

Regulatory and safety compliance

Table 7. Regulatory and safety compliance

Regulatory compliance	Regulatory compliance statement: Products comply with CE Markings according to directives 2014/30/EU and 2014/35/EU
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)

Regulatory compliance	Regulatory compliance statement: Products comply with CE Markings according to directives 2014/30/EU and 2014/35/EU
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-CISPR 32, 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 (EMC)	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)
Restriction of hazardous substances	The product is RoHS 6 compliant with exceptions for leaded Ball Grid Array (BGA) balls and lead press fit connectors.

Line card ordering Information

Table 8. 88-LC1-36EH ordering information

PIDs	Product description
88-LC1-36EH	Cisco 8800 36x QSFP-DD800; 28.8 Tbps line card
8KSW-D-SIA-3	8000 Type D Device SIA for 3 to 5 year term FCM 2.0
8KSW-D-SIA-5	8000 Type D Device SIA for 5 to 7 year term FCM 2.0
ESS-8KE-100G-RTU	Essentials Right-to-Use 100G for Cisco 8000 Series
ADN-8KE-100G-RTU	Advantage Right-to-Use 100G for Cisco 8000 Series
PRM-8KE-100G-RTU	Premium Right-to-Use 100G for Cisco 8000 Series

Table 9. 88-LC1-12TH24FH-E ordering information

PIDs	Product description
88-LC1-12TH24FH-E	Cisco 8800 12x QSFP28-DD, 24x QSFP56-DD; 12 Tbps line card
8KSW-C-SIA-3	8000 Type C Device SIA for 3 to 5 year term FCM 2.0
8KSW-C-SIA-5	8000 Type C Device SIA for 5 to 7 year term FCM 2.0
ESS-8KE-100G-RTU	Essentials Right-to-Use 100G for Cisco 8000 Series
ADN-8KE-100G-RTU	Advantage Right-to-Use 100G for Cisco 8000 Series
PRM-8KE-100G-RTU	Premium Right-to-Use 100G for Cisco 8000 Series

Table 10. 88-LC1-52Y8H-EM ordering information

PIDs	Product description
88-LC1-52Y8H-EM	Cisco 8800 52x SFP28, 8x QSFP28, 4x QSFP56-DD, 3.7 Tbps line card
8KSW-B-SIA-3	8000 Type B Device SIA for 3 to 5 year term FCM 2.0
8KSW-B-SIA-5	8000 Type B Device SIA for 5 to 7 year term FCM 2.0
ESS-8KE-100G-RTU	Essentials Right-to-Use 100G for Cisco 8000 Series
ADN-8KE-100G-RTU	Advantage Right-to-Use 100G for Cisco 8000 Series
PRM-8KE-100G-RTU	Premium Right-to-Use 100G for Cisco 8000 Series

Warranty information

Cisco hardware is backed by a limited warranty. For details on the warranty, please visit the Cisco Warranty Finder.

Cisco Licensing

Cisco 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 Cisco Licensing you get:

- **Easy activation**. Cisco 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 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.

In order to retrieve your licenses, you will first need to set up an account on Cisco Software Central.

For a more detailed overview of Cisco Licensing, go to www.cisco.com/c/en/us/buy/licensing/licensing-guide.html.

The IOS XR Flexible Consumption Model requires Cisco Licensing registration and license usage reporting. A customer network under IOS XR FCM 2.0 is considered compliant if the FCM 2.0 enabled devices in the customer's network are registered to Cisco Licensing and are reporting the usage. For a more detailed overview on Cisco IOS XR Software Flexible Consumption Model 2.0, go to https://www.cisco.com/c/en/us/products/collateral/routers/8000-series-routers/ios-xr-software-flexible-consumption-model-2-0-ds.html.

Cisco environmental sustainability

Information about Cisco's environmental sustainability policies and initiatives for our products, solutions, operations, and extended operations or supply chain is provided in the "Environmental Sustainability" section of Cisco's Corporate Social Responsibility (CSR) Report.

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

Table 11. Links to environmental sustainability topics

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

Product sustainability

Information about Cisco's environmental, social, and governance (ESG) initiatives and performance is provided in Cisco's CSR and sustainability reporting.

Table 12. Links to product sustainability topics

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 the 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

Service and support

Cisco offers a wide range of services to help accelerate your success in deploying and optimizing the Cisco P100 line cards. These innovative Cisco Services offerings are delivered through a unique combination of people, processes, tools, and partners, and they are focused on helping you increase operating efficiency and improve your network.

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

Cisco Software Support offers the Cisco Smart Net Total Care® service to help you resolve mission-critical problems with direct access at any time to Cisco network experts and award-winning technical support coverage and maintenance releases for the Essentials and Advantage software suites, helping to keep your systems and your business running smoothly. Software Support is a required purchase with the Software Innovation Access (SIA) feature upgrade licenses.

Cisco SP Base provides device-level support and helps reduce downtime with fast, expert technical support and flexible hardware coverage provided by the Cisco Technical Assistance Center (TAC). With this service, you can take advantage of the Cisco Smart Call Home service, which offers proactive diagnostics and real-time alerts on your hardware.

Spanning the entire network lifecycle, Cisco Services offerings help increase investment protection, optimize network operations, support migration operations, and strengthen your IT expertise.

For information on services for the Cisco 8000 Series P100 line cards, contact your Cisco sales representative. For an overview of all offers, visit Cisco Services for Service Providers.

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.

Documentation history

New or revised Topic	Described In	Date
Cisco P100 Line card Datasheet	Details regarding Cisco 8800 P100 based line cards	August 30, 2024

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