CISCO SYSTEMS

Cisco XR 12000 Series and Cisco 12000 Series Routers

The Cisco® XR 12000 Series and Cisco 12000 Series routers compose a portfolio of intelligent routing solutions that scale from 2.5- to n x10 Gbps capacity per slot, enabling carrier-class IP/Multiprotocol Label Switching (MPLS) networks and accelerating the evolution to IP Next-Generation Networks. Built upon a foundation of investment protection, this portfolio delivers up to 1.28-terabits-per-second switching capacity with wire-speed feature performance, scalability, and graceful hardware and software upgrade paths.

CISCO XR 12000 AND 12000 SERIES PRODUCT PORTFOLIO OVERVIEW

This portfolio of routers delivers capacity and services with its fully distributed forwarding architecture and high-efficiency crossbar switch fabric (Figure 1). The combination of a centralized scheduler and unique virtual output queuing (VOQ) technology is aimed at maximizing the use of the switch fabric bandwidth, minimizing latency, and providing nonblocking performance. Cisco Systems® uses the latest in high-performance application-specific integrated circuit (ASIC) technology to provide line-rate forwarding with an extensive feature set, while maintaining the strict control of jitter and latency required for real-time services. Offering a comprehensive set of quality-of-service (QoS), IP/MPLS, and high-availability features, the Cisco XR 12000 Series and 12000 Series routers can help ensure maximum bandwidth usage and traffic differentiation while meeting even the strictest customer service-level agreements (SLAs).

The Cisco XR 12000 Series and 12000 Series routers use Cisco IOS® XR Software and Cisco IOS Software, respectively, to deliver numerous service possibilities for network operators. With the addition of the Cisco XR 12000 Series to its high-end routing product lines, Cisco Systems gives providers a graceful upgrade path for their installed base of Cisco 12000 Series routers as they transition toward a converged IP Next-Generation Network infrastructure. For a detailed list of feature support, software capabilities, compatibility, and release notes for Cisco IOS XR and Cisco IOS Software on these routers, visit: http://www.cisco.com/go/12000.

The Cisco XR 12000 Series and 12000 Series routers product specifications are detailed in Table 1.

Figure 1. Cisco XR 12000 and 12000 series routing portfolio

Table 1. Product Specifications

Product Specification	Cisco XR 12000 and 12000 Series 16-Slot Chassis	Cisco XR 12000 and 12000 Series 10-Slot Chassis	Cisco XR 12000 and 12000 Series 6-Slot Chassis	Cisco XR 12000 and 12000 Series 4-Slot Chassis
Slot capacity	16 slots	10 slots	6 slots	4 slots
Aggregate switching capacity	Cisco 12016: 80 Gbps Cisco 12416: 320 Gbps Cisco 12816: 1280 Gbps	Cisco 12010: 50 Gbps Cisco 12410: 200 Gbps Cisco12810: 800 Gbps	Cisco 12006: 30 Gbps Cisco 12406: 120 Gbps	Cisco 12404: 80 Gbps
Full-duplex throughput per slot	Cisco 12016: 2.5 Gbps/slot Cisco 12416: 10 Gbps/slot Cisco 12816: 40 Gbps/slot	Cisco 12010: 2.5 Gbps/slot Cisco 12410: 10 Gbps/slot Cisco 12810: 40 Gbps/slot	Cisco 12006: 2.5 Gbps/slot Cisco 12406: 10 Gbps/slot	Cisco 12404: 10 Gbps/slot

Physical	Chassis height 71.5 in. (181.6 cm) 72.5 in. (184.2 cm)[1] Chassis width 17.25 in. (43.8 cm) 18.75 in. (47.6 cm)[2] Chassis depth 22.0 in. (55.9 cm) 24.0 in. (61.0 cm)[3] Weight 140 lb (64 kg)[4] 390 lb (177 kg)[5]	Chassis height 37.5 in. (95.25 cm) Chassis width 19 in. (48.26 cm) Chassis depth 22.0 in. (55.9 cm) 24.0 in. (61.0 cm) weight 125 lb (57 kg) 275 lb (125 kg)	Chassis height 18.5 in. (47.0 cm) Chassis width 17.3 in. (43.9 cm) 18.9 in. (48.0 cm) Chassis depth 28.0 in. (71.1 cm) Weight 140 lb (64 kg) 205 lb (94 kg)	Chassis height 8.75 in. (22.23 cm) Chassis width 17.38 in. (44.15 cm) 18.9 in. (48.01 cm) Chassis depth 27.5 in. (69.85 cm) Weight 73 lb (33.18 kg) 103 lb (46.82 kg)
Chassis per rack	One	Two	Four	Eight
Electrical specifications for the AC input power				
Total AC input power[1]	4651 VA (max) per chassis	2790 VA (max) per chassis	Low Line 1708 VA (max) High Line 1950 VA (max) per chassis	1341 VA (max) per chassis
Rated input voltage[2]	200–240 VAC nominal (range: 180–264 VAC)	200–240 VAC nominal (range: 180–264 VAC)	100–120 VAC (Low Line) 200–240 VAC (High Line) nominal (range: 85–264 VAC)	100–120 VAC or 200–240 VAC nominal (range: 85–264 VAC)
Rated input line frequency	50–60 Hz nominal (range: 47–63 Hz)	50–60 Hz nominal (range: 47–63 Hz)	50–60 Hz nominal (range: 47–63 Hz)	50–60 Hz nominal (range: 47–63 Hz)
Input current rating (For any line cord)	10.3A maximum @ 240 VAC	11.6A maximum @ 240 VAC	17.2A (max) @ 100 VAC 10A (max) @ 200 VAC	6A maximum @ 240 VAC
Source AC service requirement	20A North America; 16A international	20A North America; 16A international	20A North America; 16A international	20A North America; 16A international
Electrical specifications for DC input power				
Total DC input power	4212 W (max)	2430 W (max)	1630 W (max)	1280 W (max)
Rated input voltage	-48 VDC nominal in North America	-48 VDC nominal in North America	-48 VDC nominal in North America	-48 VDC nominal in North America
	-60 VDC nominal in the European community (range: -40.5 to -75 VDC)	-60 VDC nominal in the European community (range: -40.5 to -75 VDC	-60 VDC nominal in the European community (range: -40.5 to -75 VDC	-60 VDC nominal in the European community (range: -40.5 to -75 VDC
Input current rating For any DC input pair	52A maximum @ 40.5 VDC[3]	60A maximum @ 40.5 VDC	45A maximum @ 40.5 VDC	35A maximum @ 40.5 VDC

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[1] Maximum system power under worst case conditions (worst case input voltage, etc) and does not necessarily reflect what a customer will see under typical conditions for his configuration

[2] For each power supply module

[3] In the full redundant power configuration, power entry modules A1 and B1 provide redundant power for system load zone 1 (upper blower module and upper card cage). Modules A2 and B2 provide redundant power for system load zone 2 (switch fabric card cage, lower card cage, and lower blower module).

Source DC service requirement	60A	60A	60A	60A
Environmental conditions				
Temperature	Operating: 32 to 104°F (0 to 40°C) Nonoperating: -4 to 149°F (-20 to 65°C)	Operating: 32 to 104°F (0 to 40°C) Nonoperating: -4 to 149°F (-20 to 65°C)	Operating: 32 to 104°F (0 to 40°C) Nonoperating: -4 to 149°F (-20 to 65°C)	Operating: 32 to 104°F (0 to 40°C) Nonoperating: -40 to 158°F (-40 to 70°C)
Humidity	Operating: 10–90% noncondensing Nonoperating: 5–95% noncondensing	Operating: 10–90% noncondensing Nonoperating: 5–95% noncondensing	Operating: 10–90% noncondensing Nonoperating: 5–95% noncondensing	Operating: 5–90% noncondensing Nonoperating: 5–95% noncondensing
Altitude	Operating: 0–10,000 ft. (0–3000m) Nonoperating: 0–15,000 ft. (0–4570m)	Operating: 0–10,000 ft. (0–3000m) Nonoperating: 0–15,000 ft. (0–4570m)	Operating: 0–10,000 ft. (0–3000m) Nonoperating: 0–15,000 ft. (0–4570m)	Operating: 0–14,000 ft. (0–4267m) Nonoperating: 0–16,000 ft. (0–4877m)
Heat dissipation	DC (max): 4212 VA @ 14372 Btu/hr AC (max):4651 VA @ 15870 Btu/hr	DC (max): 2430 VA @ 8291 Btu/hr AC (max):2790 VA @ 9519 Btu/hr	DC (max): 1630 VA @ 5562 Btu/hr low line AC (max): 1708 VA @ 5828 Btu/hr high line AC (max): 1950 VA @ 6654 Btu/hr	DC (max): 1280 VA @ 4367 Btu/hr AC (max): 1341 VA @ 4575 Btu/hr
Acoustic noise	70 dBa maximum	70 dBa maximum	70 dBa maximum	70 dBa maximum
Shock	Operating (halfsine): 21 in./sec (0.53m/sec) Nonoperating (trapezoidal pulse): 20g, 52 in./sec (1.32 m/sec)	Operating (halfsine): 21 in./sec (0.53m/sec) Nonoperating (trapezoidal pulse): 20g, 52 in./sec (1.32 m/sec)	Operating (halfsine): 21 in./sec (0.53m/sec) Nonoperating (trapezoidal pulse): 20g, 52 in./sec (1.32 m/sec)	Operating (halfsine): 5g (11 m/sec) Nonoperating (trapezoidal pulse): 15g (11 m/sec)
Vibration	Operating: 0.35 grms[4] from 3 to 500 Hz Nonoperating: 1.0 grms from 3 to 500 Hz	Operating: 0.35 grms from 3 to 500 Hz Nonoperating: 1.0 grms from 3 to 500 Hz	Operating: 0.35 grms from 3 to 500 Hz Nonoperating: 1.0 grms from 3 to 500 Hz	Operating (sinusoidal): 3–500 Hz @ 0.15 gpk (random): 2.5–200 Hz @ 0.33 grms Storage (sinusoidal): 10–500 Hz @ 0.8 gpk (random): 2.5–200 Hz @ 1.05 grms

[4] grms is root mean square value of acceleration; gpk is peak acceleration

Hardware components (per base system)	• 4 DC power supplies, or 3 AC supplies, or 4 AC power supplies • 1 performance router processor • 16 line-card slots with 15 line cards and 1 route processor or 14 line cards and 2 route processors (1:1 redundant) • 3 switch fabric cards (SFCs) • 2 clock scheduler cards (CSCs) • 2 alarm cards • Air filters • 2 blower assemblies • 2 cable-management trays • Country-specific power cords	• 2 DC power supplies or 2 AC supplies • 1 performance router processor • 10 line-card slots with 9 line cards and 1 route processor or 8 line cards and 2 route processors (1:1 redundant) • 5 SFCs • 2 CSCs • 1 alarm card • Air filter • 1 blower assembly • 1 cable-management tray • Country-specific power cords	• 2 DC power supplies or 2 AC supplies • 1 performance router processor • 6 line-card slots with 5 line cards and 1 route processor or 4 line cards and 2 route processors (1:1 redundant) • 3 SFCs • 2 CSCs • 1 alarm card • Air filter • 1 blower assembly • 1 cable-management tray • Country-specific power cords	• 2 DC power supplies or 2 AC supplies • 1 performance router processor • 4 line-card slots with 3 line cards and 1 route processor or 2 line cards and 2 route processors (1:1 redundant) • 1 consolidated switch fabric, clock scheduler, and alarm card • Air filter • 1 blower assembly • 1 cable-management tray • Country-specific power cords
Software components (per base system)	• Cisco IOS XR or Cisco IOS Software Operating System • Cisco Express Forwarding for distributed packet forwarding	• Cisco IOS XR or Cisco IOS Software Operating System • Cisco Express Forwarding for distributed packet forwarding	• Cisco IOS XR or Cisco IOS Software Operating System • Cisco Express Forwarding for distributed packet forwarding	• Cisco IOS XR or Cisco IOS Software Operating System • Cisco Express Forwarding for distributed packet forwarding
Compatibility	Cisco 12800: Line cards that support 2.5-, 10-, or 20-Gbps capability Cisco 12400: Line cards that support 2.5- or 10-Gbps capability Cisco 12000: Line cards that support 2.5-Gbps capability			
Protocols	IPv4, MPLS, Border Gateway Protocol Version 4 (BGPv4), Intermediate System-to-Intermediate System (IS-IS), Open Shortest Path First Version 2.0 (OSPFv2.0), Routing Information Protocol Version 2 (RIPv2), Internet Group Management Protocol (IGMP), Distance Vector Multicast Routing Protocol (DVMRP), and Protocol Independent Multicast dense mode/sparse mode (PIM DX/SX)			
Connectivity	Packet over SONET/SDH (POS), Ethernet, ATM, copper (DS-3/E3), Channelized (CT3, ChOC-3/CHSTM1, ChOC-12/CHSTM4, ChOC-48/CHSTM16); see Cisco IOS XR Software release notes for specific connectivity support on the Cisco XR 12000 Series			
Reliability	System redundancy: • Fabric card redundancy 4:1 • CSC redundancy 1:1 • Power supply redundancy (1:1 for DC; AC is load balancing) • Blower redundancy 1:1 • Route processor redundancy 1:1 • Alarm card redundancy 1:1 • Dual homing through line cards • Supports automatic protection switching (APS) ASICs Mean time between failure (MTBF): • CSC = 240,078 hr • SFC = 276,062 hr			
Management interfaces	Cisco XR 12000 and Cisco 12000 Series Performance Route Processor (PRP) supports two serial ports (console and auxiliary) and one 10/100 Ethernet port			
Indicators and Interfaces	Visual alarms for critical, major, and minor states on CSCs, SFCs, and on or error condition for system alarm boards			

Compliance	Safety certification:
	● UL 1950
	● CSA-22.2 No. 950
	● EN60950
	● IEC 60950 CB Scheme
	● ACA TS001
	● AS/NZS 3260
	● EN60825\IEC60825 laser safety
	● FDA-Code of Federal Regulations (USA) laser safety
	Electromagnetic compliance (emissions):
	● FCC Class A
	● ICES-003 Class A
	● EN55022 Class B (to 1 GHz)
	● VCCI Class B (to 1 GHz)
	● AS/NZS 3548 Class B
	● MSZEN55022 Class A
	● CISPR 22 Class B (up to 1 GHz)
	● BSMI Class A
	Immunity:
	● IEC-1000-4-2 ESD (8kV contact, 15kV air)
	● IEC-1000-4-3 Radiated immunity (10V/m)
	● IEC-1000-4-4 EFT (2kV power port, 1kV signal port)
	● IEC-1000-4-5 Surge AC port (4kV CM, 2kV DM)
	● IEC-1000-4-5 Surge signal port (2kV CM, 1kV DM)
	● IEC-1000-4-5 Surge DC port (0.5kV CM, 0.5kV DM)
	● IEC-1000-4-6 Low frequency conductive immunity (10V)
	● IEC-1000-4-11 Voltage dips and sags
	● IEC-1000-3-2 Power line harmonics
Approval agencies	Network Equipment Building Standards (NEBS)
	● Designed to be NEBS-compliant
	ETSI
	● EN300386
	● ETS 300132-2

AVAILABILITY AND ORDERING

Table 2. Ordering Information

Product Specification	Part Number
Cisco XR 12000 16-slot systems	
Cisco XR 12000 16-slot Chassis with 3 AC power supplies, 320-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-2	XR-12416/320-AC
Cisco XR 12000 16-slot Chassis with 4 AC power supplies, 320-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-2	XR-12416/320-AC4
Cisco XR 12000 16-slot Chassis with 4 DC power supplies, 320-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-2	XR-12416/320-DC
Note: Cisco XR 12000 16-slot Chassis available in IOS XR Release 3.2 under limited orderability. Please contact your local Cisco sales representative for assistance.	
Cisco 12000 16-slot systems	

Cisco 12000 16-slot Chassis with 3 AC power supplies, 80-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	GSR16/80-AC-8R
Cisco 12000 16-slot Chassis with 3 AC power supplies, 320-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	GSR16/320-AC
Cisco 12000 16-slot Chassis with 3 AC power supplies, 1280-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	12816/1280-AC3
Cisco 12000 16-slot Chassis with 4 AC power supplies, 80-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	GSR16/80-AC4-8R
Cisco 12000 16-slot Chassis with 4 AC power supplies, 320-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	GSR16/320-AC4
Cisco 12000 16-slot Chassis with 4 AC power supplies, 1280-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	12816/1280-AC4
Cisco 12000 16-slot Chassis with 4 DC power supplies, 80-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	GSR16/80-DC-8R
Cisco 12000 16-slot Chassis with 4 DC power supplies, 320-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	GSR16/320-DC
Cisco 12000 16-slot Chassis with 4 DC power supplies, 1280-Gbps fabric (2 CSC and 3 SFC cards), 2 blowers, 2 alarms, and 1 PRP-1	12816/1280-DC
Cisco XR 12000 10-slot systems	
Cisco XR 12000 10-slot Chassis with 2 AC power supplies, 200-Gbps fabric (2 CSC and 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-2	XR-12410/200-AC
Cisco XR 12000 10-slot Chassis with 2 DC power supplies, 200-Gbps fabric (2 CSC and 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-2	XR-12410/200-DC
Note: Cisco XR 12000 10-slot Chassis available in IOS XR Release 3.2 under limited orderability. Please contact your local Cisco sales representative for assistance.	
Cisco 12000 10-slot systems	
Cisco 12000 10-slot Chassis with 2 AC power supplies, 50-Gbps fabric (2 CSC and 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	12010-AC
Cisco 12000 10-slot Chassis with 2 DC power supplies, 50-Gbps fabric (2 CSC and 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	12010-DC
Cisco 12000 10-slot Chassis with 2 AC power supplies, 200-Gbps fabric (2 CSC and 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	GSR10/200-AC
Cisco 12000 10-slot Chassis with 2 DC power supplies, 200-Gbps fabric (2 CSC and 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	GSR10/200-DC
Cisco 12000 10-slot Chassis with 2 AC power supplies, 800-Gbps fabric (2 CSC and 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	12810/800-AC
Cisco 12000 10-slot Chassis with 2 DC power supplies, 800-Gbps fabric (2 CSC and 5 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	12810/800-DC
Cisco XR 12000 6-slot systems	
Cisco XR 12000 6-slot Chassis with 1 AC power supply, 120-Gbps fabric (1 CSC and 3 SFC cards), 1 blower, 2 alarms, and 1 PRP-2	XR-12406/120-AC
Cisco XR 12000 6-slot Chassis with 1 DC power supply, 120-Gbps fabric (1 CSC and 3 SFC cards), 1 blower, 2 alarms, and 1 PRP-2	XR-12406/120-DC
Note: Cisco XR 12000 6-slot Chassis available in IOS XR Release 3.2 under limited orderability. Please contact your local Cisco sales representative for assistance.	
Cisco 12000 6-slot systems	
Cisco 12000 6-slot Chassis with 2 AC power supplies, 30-Gbps fabric (2 CSC and 3 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	12006-AC
Cisco 12000 6-slot Chassis with 2 DC power supplies, 30-Gbps fabric (2 CSC and 3 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	12006-DC

Cisco 12000 6-slot Chassis with 1 AC power supply, 120-Gbps fabric (1 CSC and 3 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	GSR6/120-AC
Cisco 12000 6-slot Chassis with 1 DC power supply, 120-Gbps fabric (1 CSC and 3 SFC cards), 1 blower, 2 alarms, and 1 PRP-1	GSR6/120-DC
Cisco XR 12000 4-slot systems	
Cisco XR 12000 4-slot Chassis with 1 AC power supply, 120-Gbps fabric (consolidated switch fabric, clock scheduler, and alarm card), 1 blower, and 1 PRP-2	XR-12404/80-AC
Cisco XR 12000 4-slot Chassis with 1 DC power supply, 120-Gbps fabric (consolidated switch fabric, clock scheduler, and alarm card), 1 blower, and 1 PRP-2	XR-12404/80-DC
Note: Cisco XR 12000 4-slot Chassis available in IOS XR Release 3.2 under limited orderability. Please contact your local Cisco sales representative for assistance.	
Cisco 12000 4-slot systems	
Cisco 12000 4-slot Chassis with 1 AC power supply, 120-Gbps fabric (consolidated switch fabric, clock scheduler, and alarm card), 1 blower, and 1 PRP-1	GSR4/80-AC
Cisco 12000 4-slot Chassis with 1 DC power supply, 120-Gbps fabric (consolidated switch fabric, clock scheduler, and alarm card), 1 blower, and 1 PRP-1	GSR4/80-DC

SERVICE AND SUPPORT

Cisco Systems has earned high customer satisfaction ratings for its wide range of support offerings for service providers. Whether the goal is speed to market, maximizing network availability, or enhancing customer satisfaction and retention, Cisco is committed to the success of service providers.

FOR MORE INFORMATION

For more information about Cisco service and support programs and benefits, visit: http://www.cisco.com/en/US/support/index.html.

For more information about the Cisco XR 12000 Series and Cisco 12000 Series routers, visit: http://www.cisco.com/en/US/products/ps6342/index.html.

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