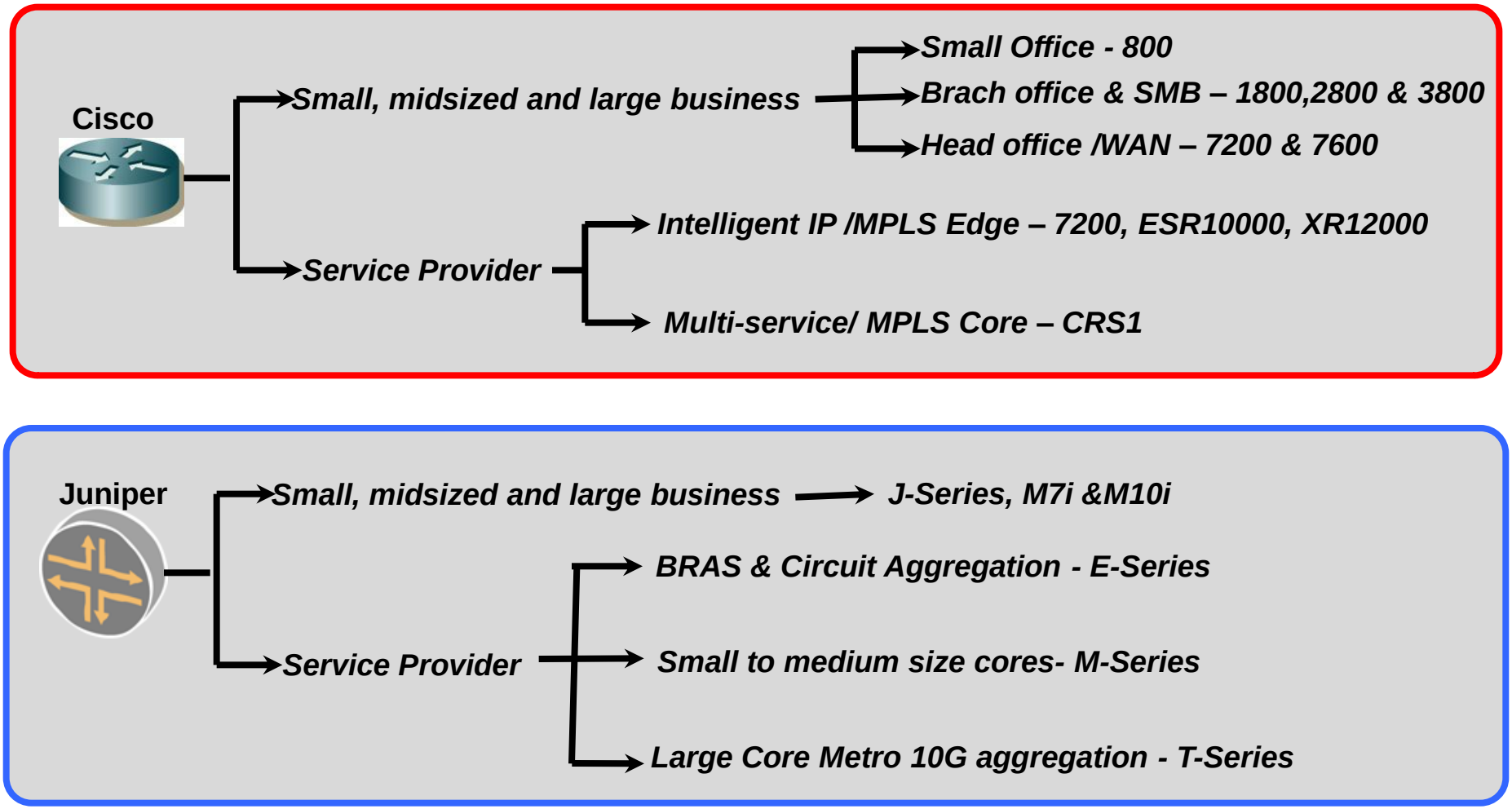
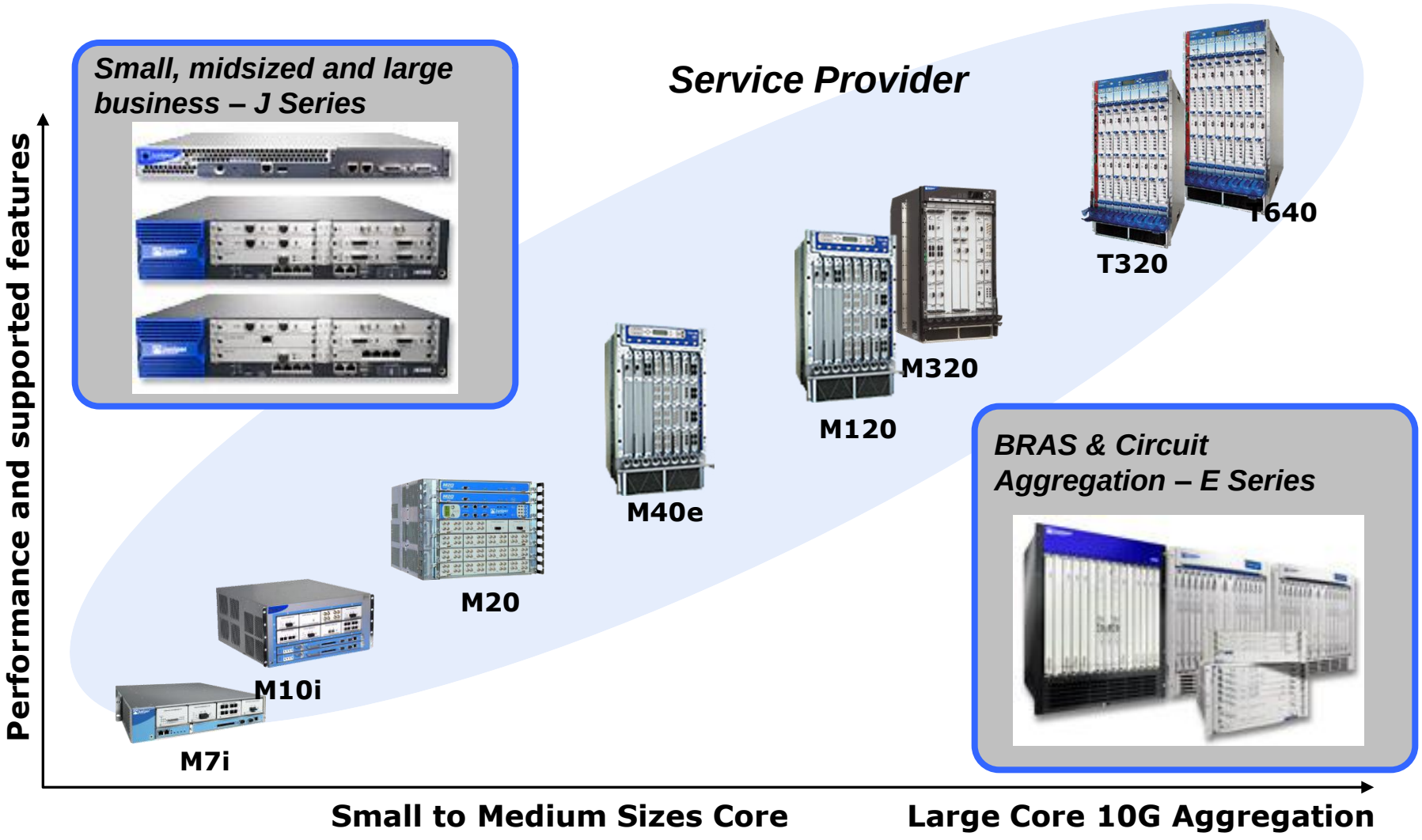
Routers

Overview of the two portfolios

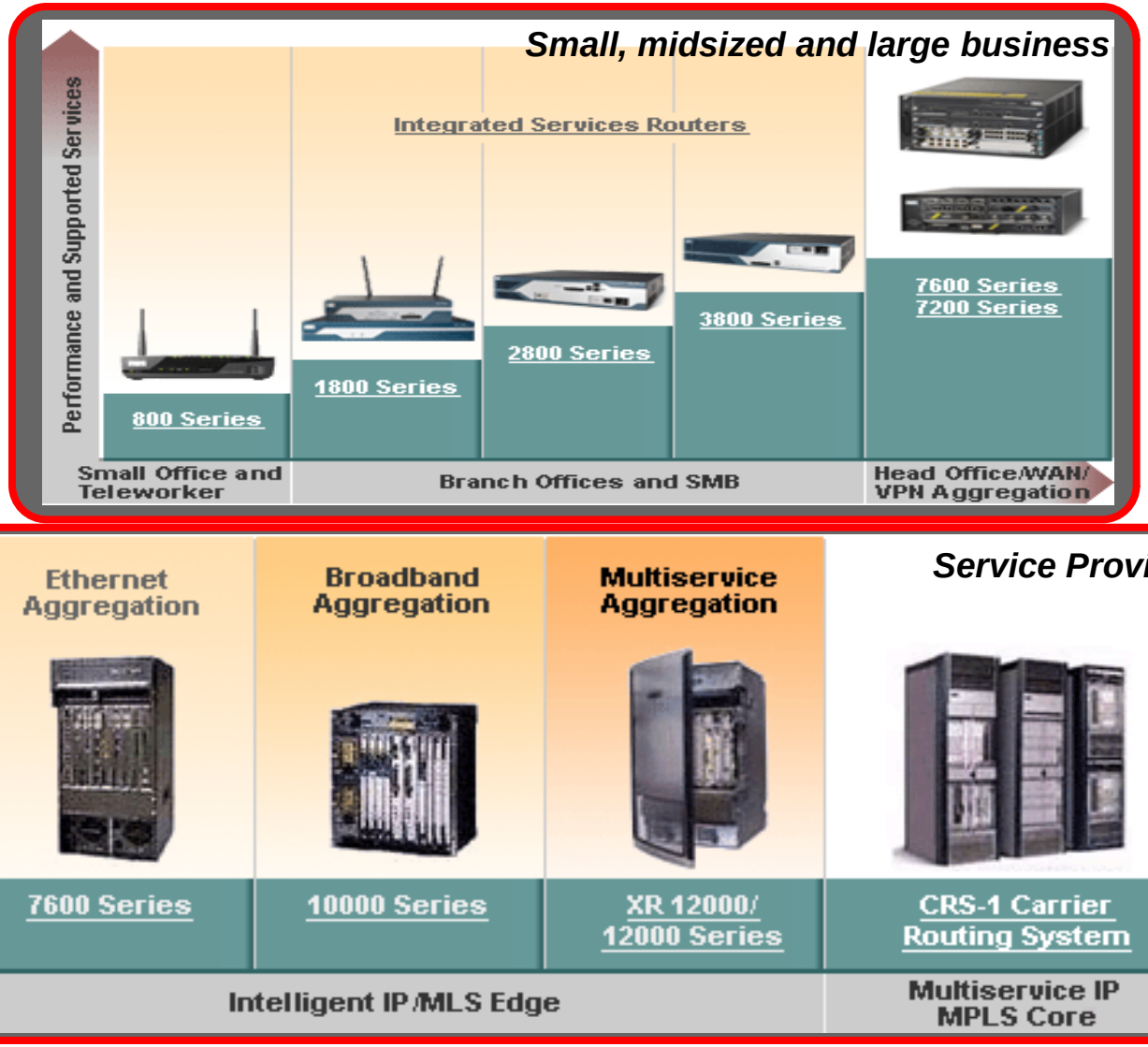


Juniper Router At-A-Glance

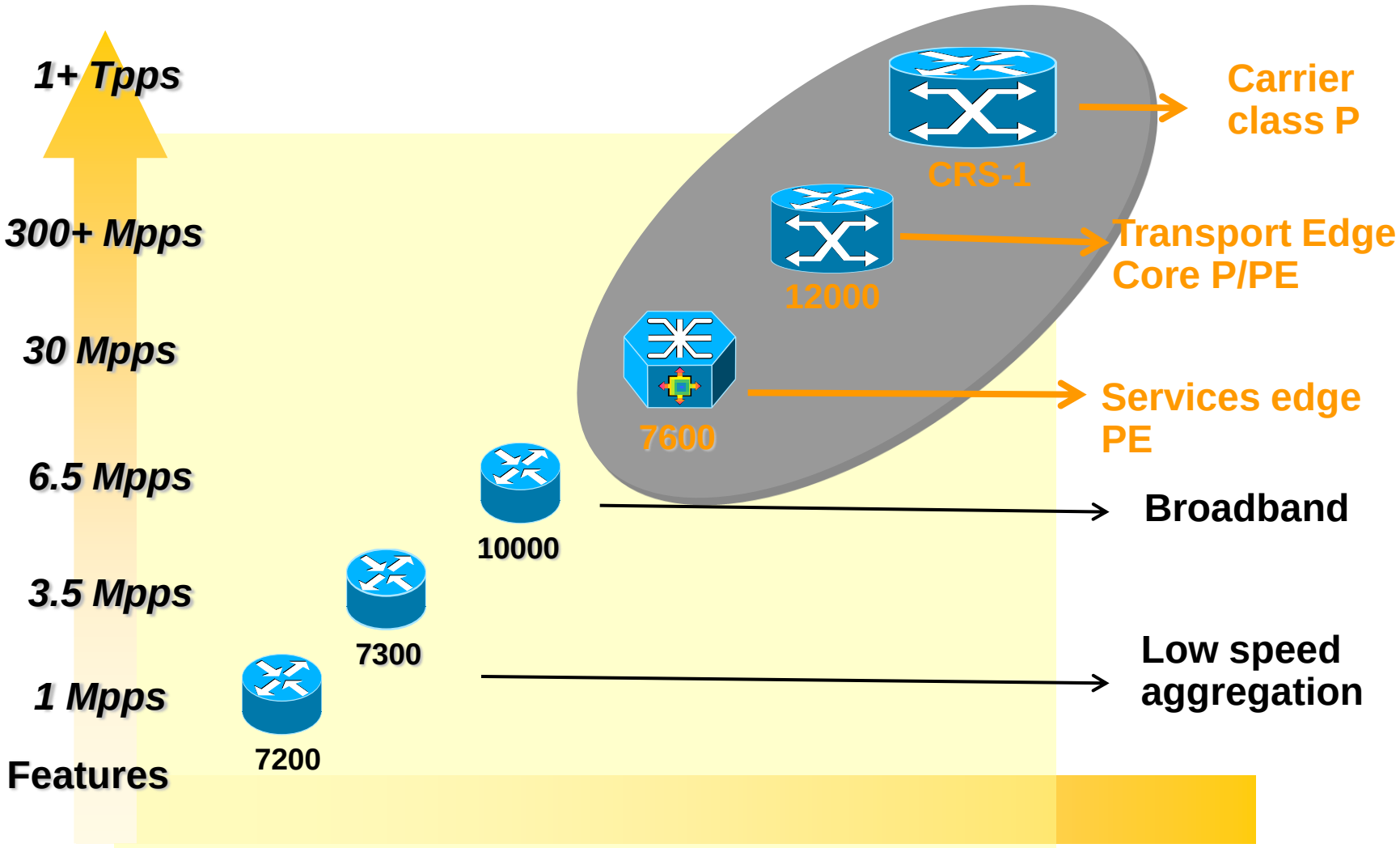


NEWOUTLOOK.IT

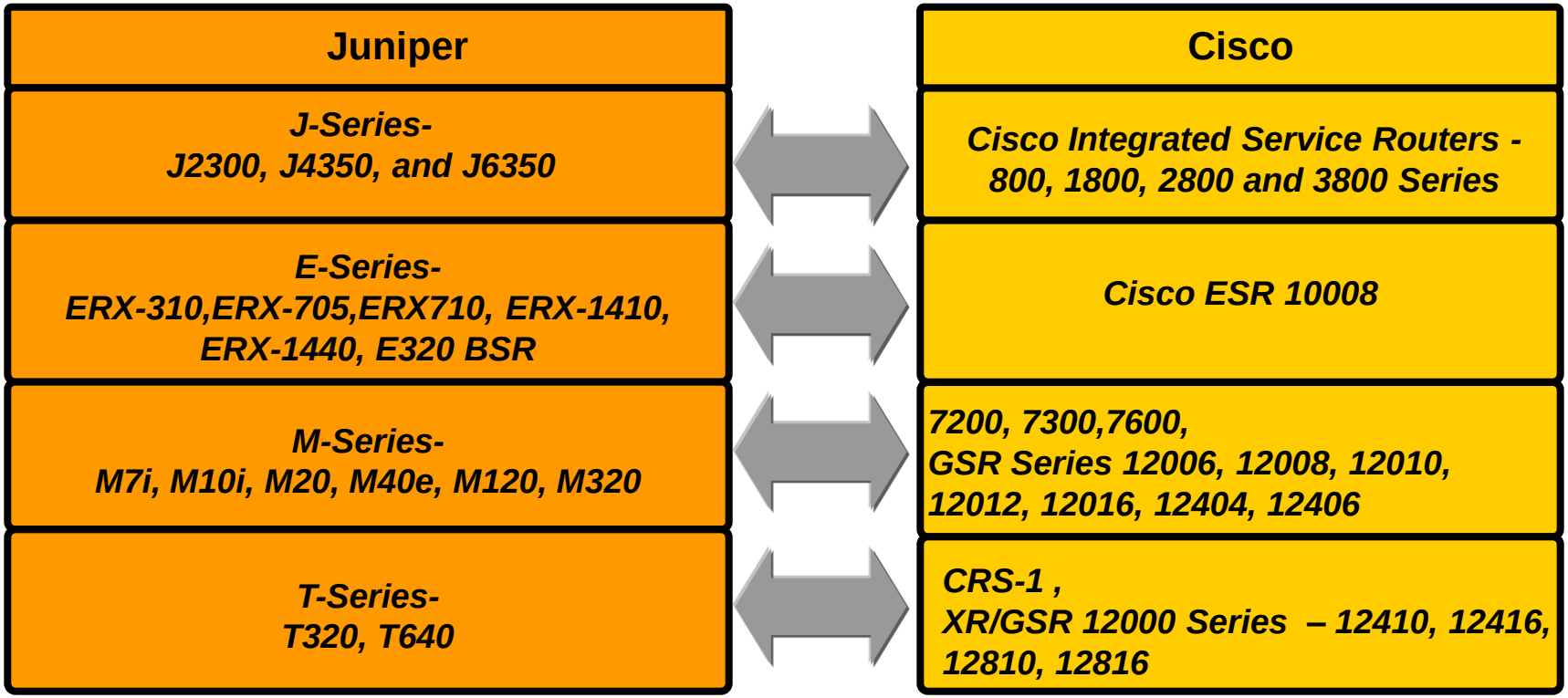
Cisco Router At-A-Glance



Cisco Platforms



So sánh Juniper/Cisco



So sánh Core Routers

Juniper T640 and Cisco CRS-1 (Min Configuration)

	Juniper T640	Cisco CRS-1
Rack Size	half (19“)	half (proprietary)
Max Throughput per slot *	40 Gbps *	40 Gbps *
Slot numbers	8	4
Total Throughput *	320 Gbps *	160 Gbps *
Max 10GE ports	32	32 or 16 (DWMPHY)
Max OC192/STM-64 ports	32	16
Max GE ports	320	192
Max STM-1 ports	128	96
Power Consumption (DC Power)	6.5 kW	4.3 kW (fully equipped)
Dimension (HxWxD)	37.45 x 17.43 x 31 in 95.12 x 44.27 x 78.74 cm	30x17.6x30.3 in 76.2x44.7x77 cm
Forwarding Capacity	770 Mpps	125 Mpps
Number of Routes	1.000.000	N/A
Chassis per rack	2	2
Multi-Chassis Configuration	No	No

*** Throughput is given per each direction. Please multiply by 2 to get „California counting“.**

NEWOUTLOOK.IT

Juniper T640 and Cisco CRS-1 (Max Configuration)

	Juniper T640	Cisco CRS-1
Rack Size	3 x full 19" Rack	80 x full Rack
Max Throughput per slot (full-duplex)	40 Gbps	40 Gbps
Slot numbers	32	1152
Total Throughput (full-duplex)	1,28 Tbps	46 Tbps
Max 10GE ports	128	9,216 or 4,608 (WDMPHY)
Max OC192/STM-64 ports	128	4,608
Max GE ports	1,280	55,296
Max STM-1 ports	512	27,648
Power Consumption (DC Power)	30.5 kW	859kW (fully equipped)
Dimension (HxWxD)	44.5 x 17.4 x 30 in 113 x 44.2 x 76.2 cm plus 4 x T640	84x23.6x36 inch (213.4x60x91.4 cm)
Forwarding Capacity	3 Gpps	36 Gpps
Number of Route	N/A	N/A
Chassis per rack	1	1
Multi-Chassis Configuration	yes	yes

* Throughput is given per each direction. Please multiply by 2 to get „California counting".

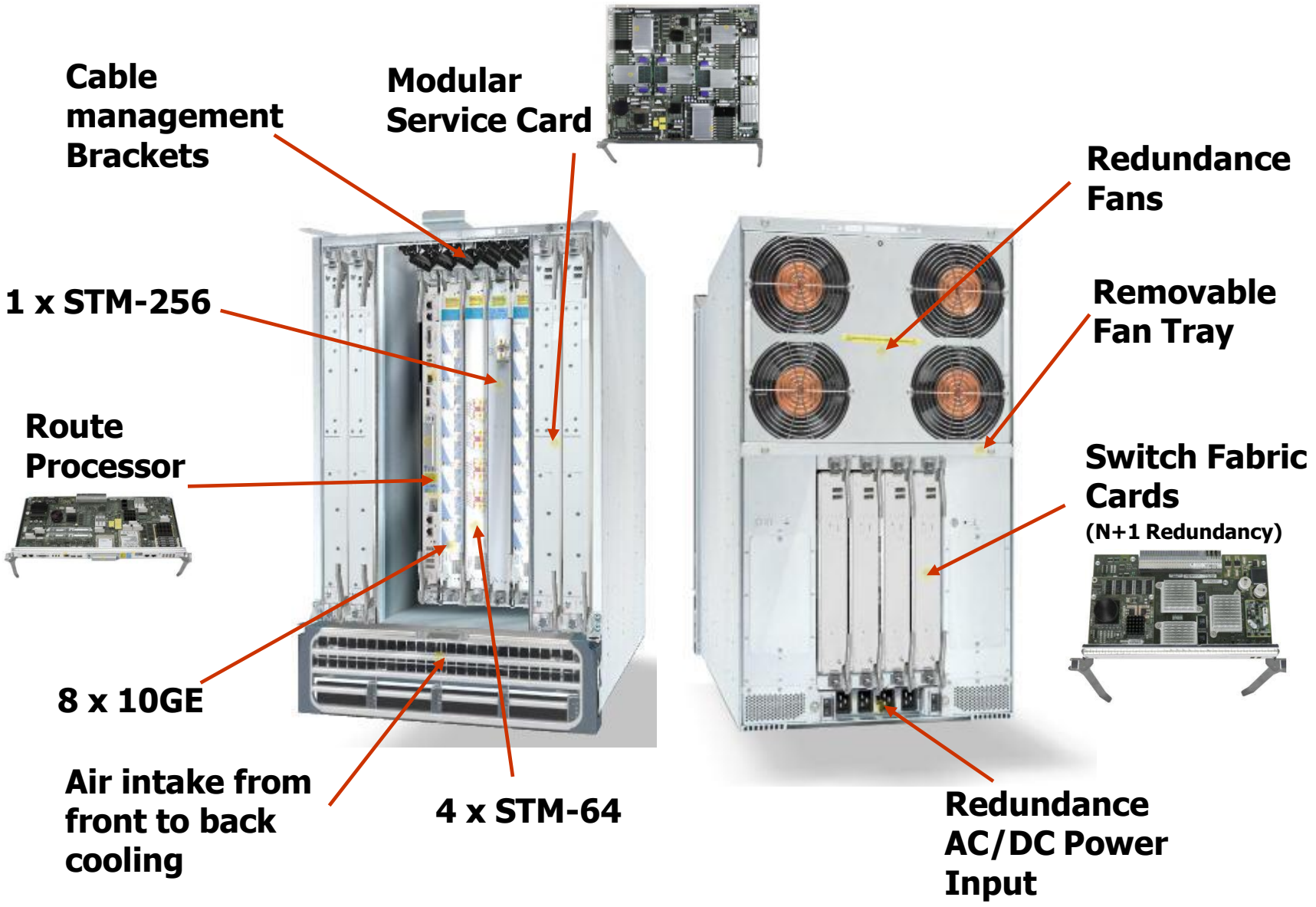
NEWOUTLOOK.IT

Juniper T640

Front View

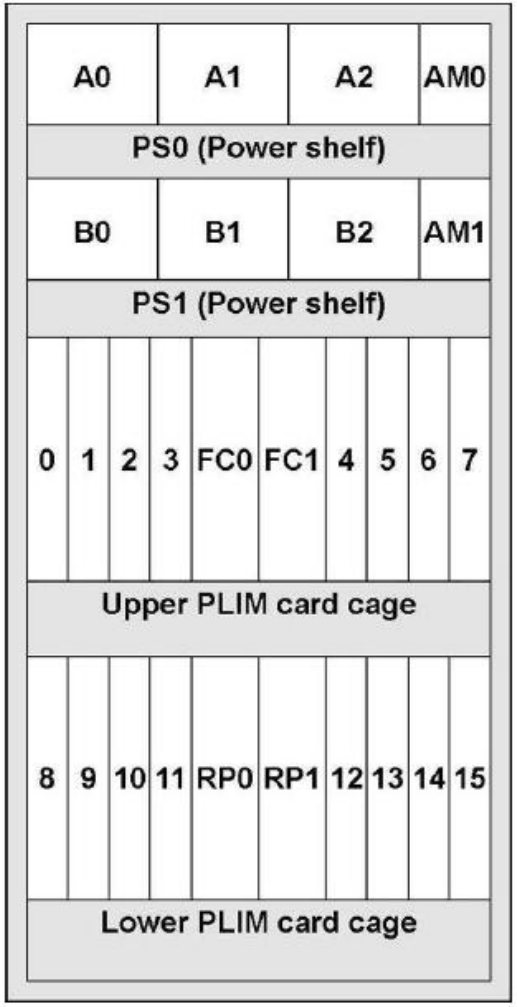
Rear View

Cisco CRS-1 4 slot Single-chassis



Cisco CRS-1 16 slots Single-Chassis (front view)

View of the Front with PLIMS Inserted



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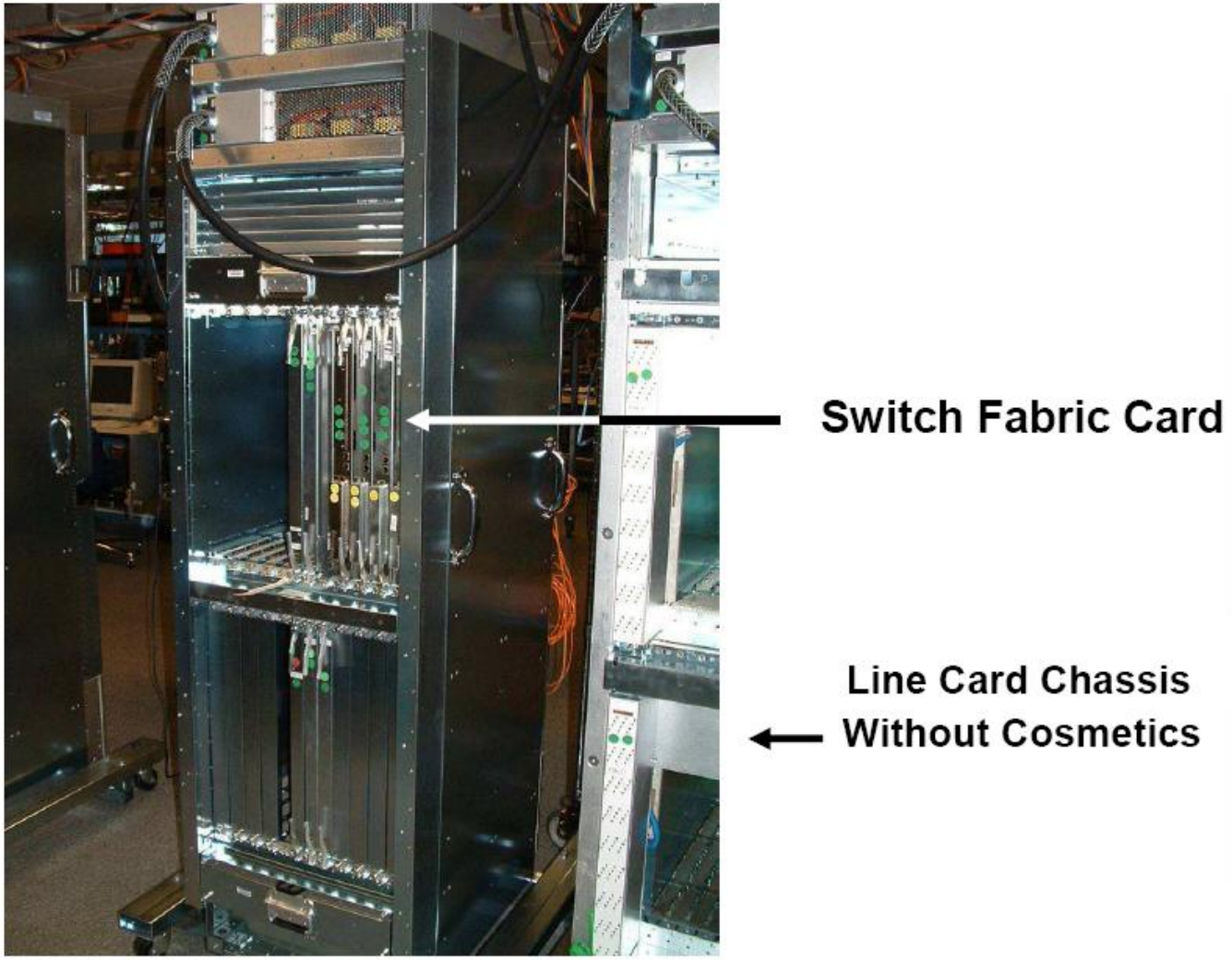
Cisco CRS-1 (rear view)

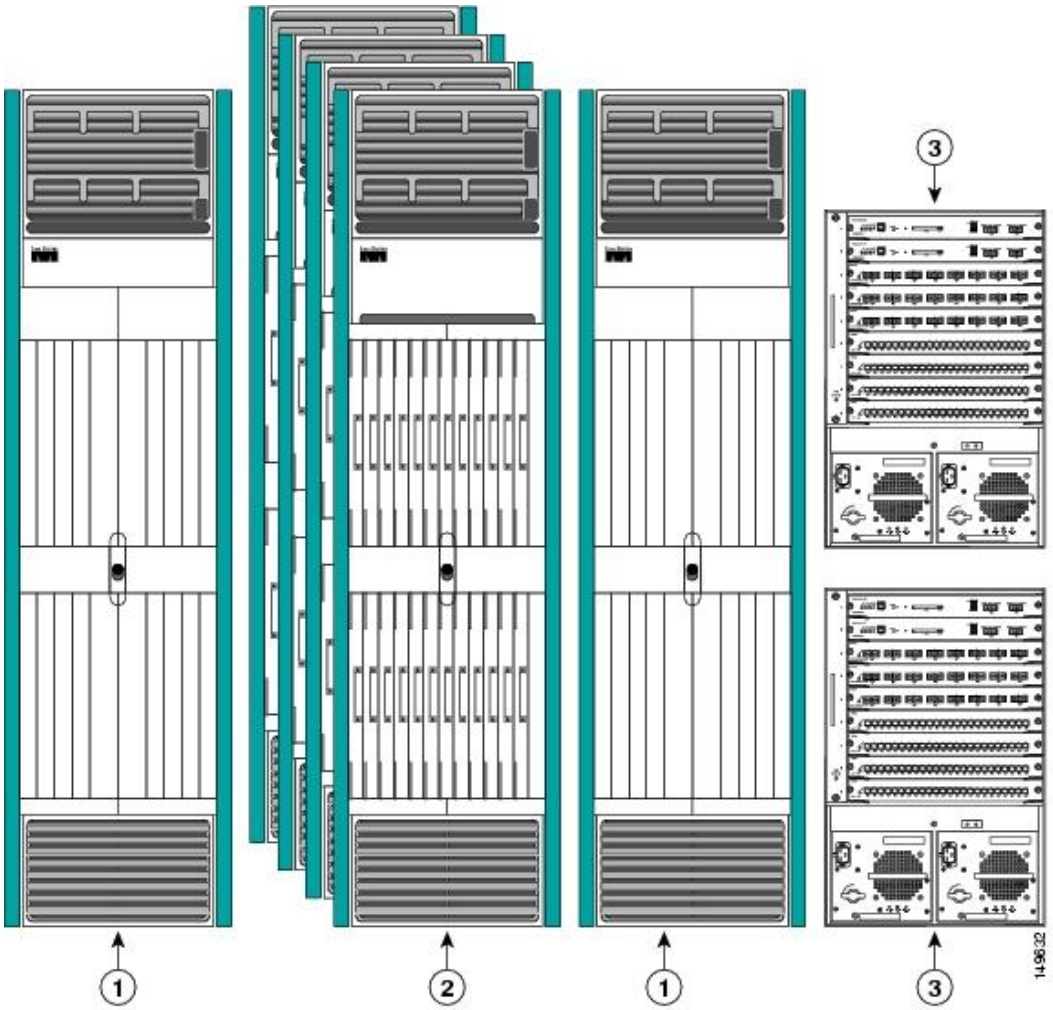


NEWOUTLOOK.IT

Cisco CRS-1 Multi-chassis Configuration

NEWOUTLOOK.IT

Cisco CRS-1 Multi-chassis Configuration
(more BW)



1	Cisco CRS-1 16-Slot Line Card Chassis	3	Cisco Catalyst 6509 Switch[1]
2	Cisco CRS-1 Fabric Card Chassis		

NEWOUTLOOK.IT

Comparing the PE Routers

Comparing M120 with Cisco 7604

Juniper M120 and Cisco 7604

	Juniper M120	Cisco 7604
Rack Size	1/4	1/9
Max Throughput per slot*	10 Gbps	40Gbps
Slot numbers	6	4
Total Throughput*	60Gbps	160Gbps
Dimension (HxWxD)	20,75 x 17,5 x 25,7 in. (52,7 x 44,5 x65,3 cm)	8.75 x 17.5 x 21.75 in. (22.225 x 44.45 x 55.245cm)
Multi-Chassis	No	No
Chassis per rack	4	9

*** Throughput is given per each direction. Please multiply by 2 to get „California counting“.**

Juniper M120 and Cisco 7604 (cont.)

	Juniper M120	Cisco 7604
Power Consumption	DC power: 40-60V DC AC power: 100-240 VAC Maximum Power Draw – 2000W	110 to 240 VAC, –48 to –60 VDC
Number of Routes	1,000,000	1,000,000
Forwarding Capacity	144 Mpps	30-Mpps and up to 144-Mpps forwarding rate distributed
Max GE ports	40	146
Max 10GE ports	6	6
Max STM-1 ports	64	48
Max OC192 ports	6	3

NEWOUTLOOK.IT

Comparing M320 with Cisco 7606

Juniper M320 and Cisco 7606

	Juniper M320	Cisco 7606
Rack Size	1/2	1/6
Max Throughput per slot*	20 Gbps	40Gbps
Slot numbers	8	6
Total Throughput*	160 Gbps	240Gbps
Dimension (HxWxD)	34.8 x 17.4 x 25.7 in 88.4 x 44.3 x 65.1 cm	12.25 x 17.37 x 21.75 in. (31.11 x 44.12 x 55.25cm)
Multi-Chassis	no	No
Chassis per rack	2	6

*** Throughput is given per each direction. Please multiply by 2 to get „California counting“.**

Juniper M320 and Cisco 7606 (cont.)

	Juniper M320	Cisco 7606
Power Consumption	65 A at -48 VDC 3,150 watts	208 to 240 VAC or –48 to –60 VDC
Number of Routes	1,000,000	1,000,000
Forwarding Capacity	385 Mpps	30-Mpps and up to 240-Mpps forwarding rate distributed
Max GE ports	160 at line rate 256 with oversubscription	242
Max 10GE ports	16	10
Max STM-1 ports	128	80
Max OC192 ports	16	5

Comparing M320 with Cisco 7609

Juniper M320 and Cisco 7609

	Juniper M320	Cisco 7609
Rack Size	1/2	1/2
Max Throughput per slot*	20 Gbps	40Gbps
Slot numbers	8	9
Total Throughput*	160 Gbps	360Gbps
Dimension (HxWxD)	34.8 x 17.4 x 25.7 in 88.4 x 44.3 x 65.1 cm	36.75 x 17.2 x 20.7 in. (93.3 x 43.1 x 53.3 cm)
Multi-Chassis	no	No
Chassis per rack	2	2

*** Throughput is given per each direction. Please multiply by 2 to get „California counting“.**

NEWOUTLOOK.IT

Juniper M320 and Cisco 7609 (cont.)

	Juniper M320	Cisco 7609
Power Consumption	65 A at -48 VDC 3,150 watts	208 to 240 VAC or –48 to –60 VDC
Number of Routes	1,000,000	1,000,000
Forwarding Capacity	385 Mpps	30-Mpps and up to 400-Mpps forwarding rate distributed
Max GE ports	160 at line rate 256 with oversubscription	386
Max 10GE ports	16	16
Max STM-1 ports	128	128
Max OC192 ports	16	8

Comparing M320 with Cisco 7613

Juniper M320 and Cisco 7613

	Juniper M320	Cisco 7613
Rack Size	1/2	1/2
Max Throughput per slot*	20 Gbps	40Gbps
Slot numbers	8	13
Total Throughput*	160 Gbps	360Gbps
Dimension (HxWxD)	34.8 x 17.4 x 25.7 in 88.4 x 44.3 x 65.1 cm	33.3 x 17.2 x 18.1 in. (82.3 x 42.5 x 44.7 cm)
Multi-Chassis	no	No
Chassis per rack	2	2

*** Throughput is given per each direction. Please multiply by 2 to get „California counting“.**

Juniper M320 and Cisco 7613 (cont.)

	Juniper M320	Cisco 7613
Power Consumption	65 A at -48 VDC 3,150 watts	208 to 240 VAC or –48 to –60 VDC
Number of Routes	1,000,000	1,000,000
Forwarding Capacity	385 Mpps	30-Mpps and up to 400-Mpps forwarding rate distributed
Max GE ports	160 at line rate 256 with oversubscription	410
Max 10GE ports	16	17
Max STM-1 ports	128	192
Max OC192 ports	16	12

7600 Series Router

7613

7604

NEWOUTLOOK.IT

Comparing M320 with Cisco 12000

Juniper M320 and MAX Cisco 12000 (12816)

	Juniper M320	MAX Cisco 12000
Rack Size	1/2	Full
Max Throughput per slot*	20 Gbps	40Gbs
Slot numbers	8	16
Total Throughput*	160 Gbps	640
Dimension (WxHxD)	34.8 x 17.4 x 25.7 in 88.4 x 44.3 x 65.1 cm	19 in. (48.3cm)x79.11 in.(200.9 cm)x26.25 in.(66.7 cm)
Multi-Chassis	no	Yes
Chassis per rack	2	1

*** Throughput is given per each direction. Please multiply by 2 to get „California counting“.**

Juniper M320 and MAX Cisco 12000 (cont.)

	Juniper M320	MAX Cisco 12000
Power Consumption	65 A at -48 VDC 3,150 watts	200-240 VAC nominal -48 VDC nominal in North America
Number of Route	1,000,000	200,000
Forwarding Capacity	385 Mpps	1280 Gbps
Max GE ports	160 at line rate 256 with oversubscription	60/ 300 (SPA)*
Max 10GE ports	16	15/ 30 (SPA)*
Max STM-1 ports	128	240/ 480 (SPA)**
Max OC192 ports	16	30/ 30 (SPA)*

* Only with SIP 600 or 601

* * Only with SIP 401, 501 or 601

Juniper M320 and MIN Cisco 12000 (12404)

	Juniper M320	MIN Cisco 12000
Rack Size	1/2	1/8
Max Throughput per slot*	40 Gbps	10Gbs
Slot numbers	8	4
Total Throughput*	320 Gbps	40
Dimension (WxHxD)	34.8 x 17.4 x 25.7 in 88.4 x 44.3 x 65.1 cm	19 in. (48.3cm)x8.75 in.(22.23 cm)x30.75 in.(78.1 cm)
Multi-Chassis	no	Yes
Chassis per rack	2	8

*** Throughput is given per each direction. Please multiply by 2 to get „California counting“.**

Juniper M320 and MIN Cisco 12000 (cont.)

	Juniper M320	MIN Cisco 12000
Power Consumption	65 A at -48 VDC 3,150 watts	100-120 VAC or 200-240 VAC nominal -48 VDC nominal in North America
Number of Route	1,000,000	200,000
Forwarding Capacity	385 Mpps	80 Gbps
Max GE ports	160 at line rate 256 with oversubscription	12/ 60 (SPA)*
Max 10GE ports	16	3/ 6 (SPA)*
Max STM-1 ports	128	48/ 96 (SPA)**
Max OC192 ports	16	6/ 6 (SPA)*

* Only with SIP 600 or 601

* * Only with SIP 401, 501 or 601

12000 Series Router (Front View)

12816

12404

NEWOUTLOOK.IT

Comparing the BRAS

Juniper E320 and Cisco ESR 10008

	Juniper E320	Cisco ESR 10008
Rack Size	1/2	1/3
Max Throughput per slot*	10Gbps	3.2Gbps
Slot numbers	12	8
Total Throughput*	160Gbps	25.6Gbps
Dimension (HxWxD)	24.5 x 19 x 25 in. (62.23 x 48.26 x 63.5 cm)	21.75 x 17.5 x 12 in. (55.2 x 44.5 x 30.5 cm)
Multi-Chassis	No	No
Chassis per rack	2	3

*** Throughput is given per each direction. Please multiply by 2 to get „California counting“.**

Juniper E320 and Cisco ESR 10008 (cont.)

	Juniper E320	Cisco ESR 10008
Power Consumption	DC Input 4800 W, 16380 BTU/hour maximum Voltage –40° to –72° VDC Current 100 A @ –48 VDC	–48/–60 VDC or 100–240 VAC, 50/60 Hz, single phase 1500VA for AC PEM, 1280W for DC PEM
Forwarding Capacity	385 Mpps	9.7-Mpps
Max GE ports	96	16
Max 10GE ports	12	No 10GE
Max STM-1 ports	144	48
Max OC192 ports	12	No OC192
Max. Number of simultaneous subscriber sessions	96,000	61,500

NEWOUTLOOK.IT

Juniper Router

Juniper J-Series Router

- Juniper J-series Routers, consisting of the J2300, J4350, and J6350
- Offer predictable high performance and a variety of flexible interfaces that deliver secure reliable network connectivity to remote, branch, and regional offices
- The J4350 and J6350 are Avaya voice-ready, and all models run modular JUNOS software which offers many advanced services (MPLS, IPv6, QoS, multicast, etc) and security (stateful firewall and IPSec VPN), delivering high levels of security, uptime and performance at reduced operations costs

- The J-series offers the performance headroom and extensible memory to meet future demands, providing unmatched reliability, investment protection, and value for the enterprise

Juniper E-Series Broadband Service Router

- Carrier-class routing with wire-speed performance
- Comprehensive Subscriber Management and IP Service Support
- Low operational costs and consistent services, with a single JUNOSe image across all platforms and policy-based control via SDX-300
- Sophisticated, dynamic QoS implementation optimized for multiplay service delivery to business and residential customers

NEWOUTLOOK.IT

Juniper M-Series Router

- M7i, M10i, M20, M40e, M120, M320 Multiservice Edge Routers
- Multiservice edge router delivering any Layer 2 or Layer 3 service to any customer
- Low operational costs and consistent services, with a single JUNOS image across all platforms and policy-based control via SDX-300
- IP/MPLS services that scale with proven stability in the world's largest networks

NEWOUTLOOK.IT

Juniper T-Series Router

- Efficient scaling, from 320 Gbps to multiterabit levels
- Matrix technology allows multi-chassis configuration supporting multi-terabits throughput
- Support for all interface types including SONET, Ethernet, ATM, and Channelized
- Architected to support speeds from Channelized up to 40 G
- Full IPv4 and IPv6 unicast and multicast support
- MPLS and GMPLS support
- Advanced security features including industry-leading control-plane protection
- Carrier of carrier VPNs

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Cisco Router

Cisco 7600 Series Routers

Chassis Form Factors

7609-S

7606-S

	4-slot	6-slot	9-slot	13-slot
# of Slots	4 (horizontal)	6 (horizontal)	9 (vertical)	13 (horizontal)
Height	8.75” (5RU)	12.25” (7RU)	33.5” (21RU)	30.15” (19RU)
Bandwidth	320 Gbps	480 Gbps	720 Gbps	720 Gbps
Performance	30+ Mpps 144 Mpps dist	30+ Mpps 240 Mpps dist	30+ Mpps 400 Mpps dist	30+ Mpps 400 Mpps dist

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Cisco 7600 Series Routers

ENGINE

SUP32-3B/3BXL

L2+L3, 32 Gbps Fabric

SUP720-3B/3BXL

L2+L3, 720 Gbps Fabric

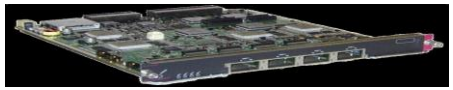
RSP720-3C/3CXL

L2+L3, 720 Gbps Fabric

INTERFACES

SPA Interface Processors

Modular Carriers for WAN & Metro Shared Port Adapters



High-Density Ethernet Modules

High-density Gigabit Ethernet and 10 Gigabit Ethernet with Distributed, Line-rate Performance

Enhanced FlexWAN

7500 Interface & Service Parity

Services Modules

Distributed Security; IPSec, Firewall, IDS, DoS Protection, etc.

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Cisco 7600 Series Routers

- Flexibility of 4 different form factors chassis: 7604,7606,7609 and 7613
- Modular and scalable from 32 Gbps to 720 Gbps switch fabric, or 40 Gbps capacity per slot
- One of the widest, most complete ranges of WAN interface in the industry, with DS0 to OC-192 WAN connectivity and 10 Gbps Ethernet
- Supports the new Cisco Shared Port Adapter (SPA)/SPA Interface Processor (SIP) portfolio, offering dramatically increased slot economics
- Support high-performance applications e.g. IP/MPLS PE, Metro Ethernet access, Enterprise WAN aggregation

- Leveraging the FlexWAN module,7x00 port adapters are shared with 7200 and 7500
- Compatible with Cat 6500 LAN interfaces, offering 10 Mbps Ethernet to 10 Gbps
- Business-class security supports service modules including IPSec, firewall, SSL, VPN, IDS and DoS

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Cisco 12000 Series Routers Model

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)

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Cisco 12000 Series Routers Model (cont.)

The Cisco 12000 Series offers the only portfolio 10-Gbps systems with the capacity, performance, service enablers, and operational efficiencies to build the most competitive IP networks.

Elements of the Cisco 12000 Series include:

- An array of chassis options that fit your scaling and real-estate requirements
- A superior distributed architecture where important components are distributed across line cards, helping ensure higher performance and system availability
- An extensive portfolio of line cards and options such as redundant gigabit route processors and a 1:N redundant, modular switch fabric that delivers interface diversity, high performance, and high availability
- Industry-leading Cisco IOS Software to help enable the delivery of a comprehensive suite of software features that are needed to support today's networks and tomorrow's value-added services
- Cisco 12000 Router Manager to help customers deploy, configure, and manage Cisco 12000 Series products

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12000 Important Features:

- Cisco I-Flex design--A portfolio of shared port adapters (SPAs) and SPA interface processors (SIPs) that prioritize voice, video, and data services so you can meet your customers' diverse service needs and stringent service-level agreements
- Advanced software technologies, for high standards of routing performance and QoS
- Comprehensive high-availability support to help avoid planned and unplanned network downtime
- Integrated core and edge feature set, supporting a wide range of business and consumer services
- Fully upgradable modular switch fabric and Cisco IOS XR Software upgrade capability, to protect investments and reduce total cost of ownership.

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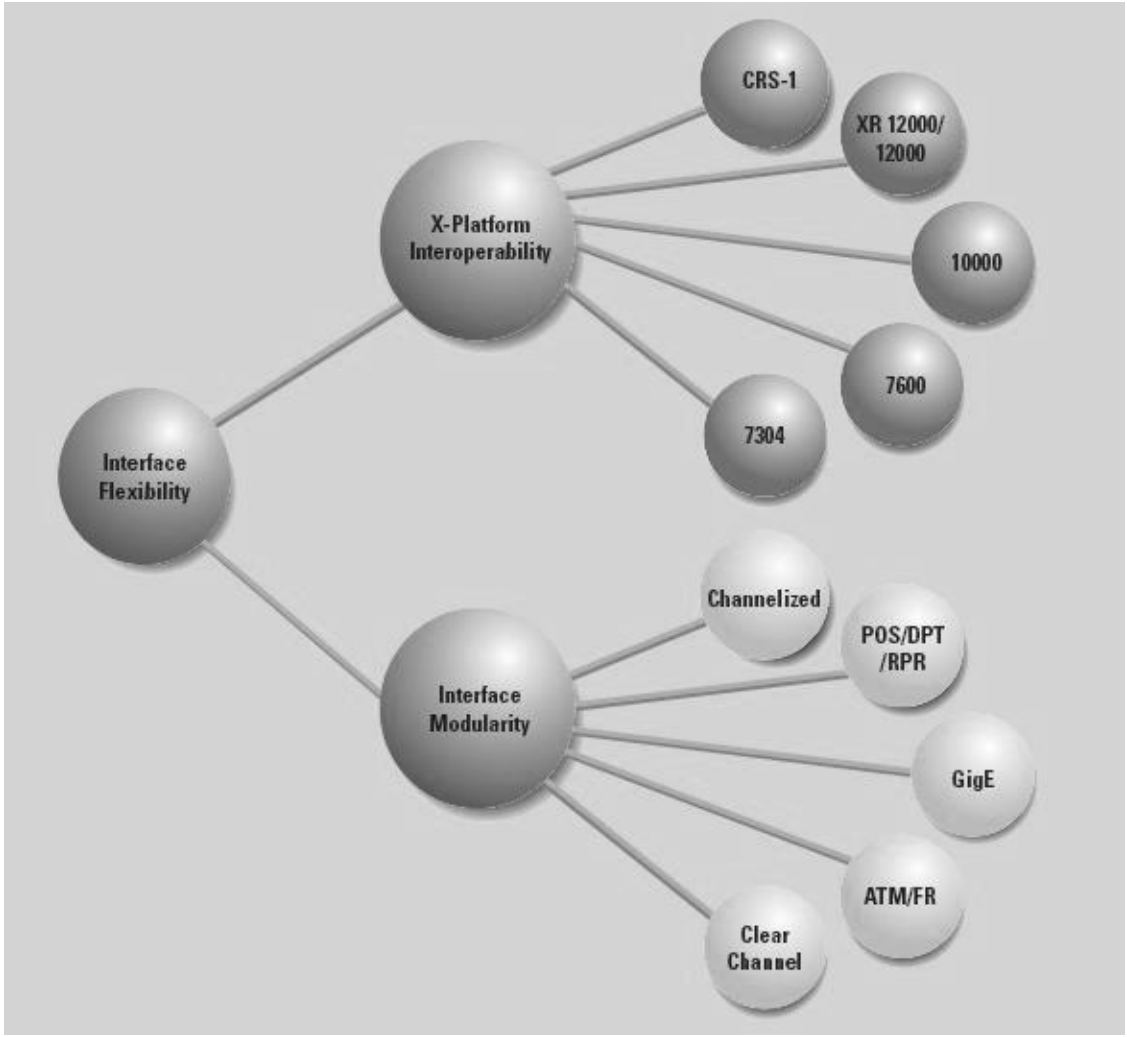
Cisco I-Flex Design



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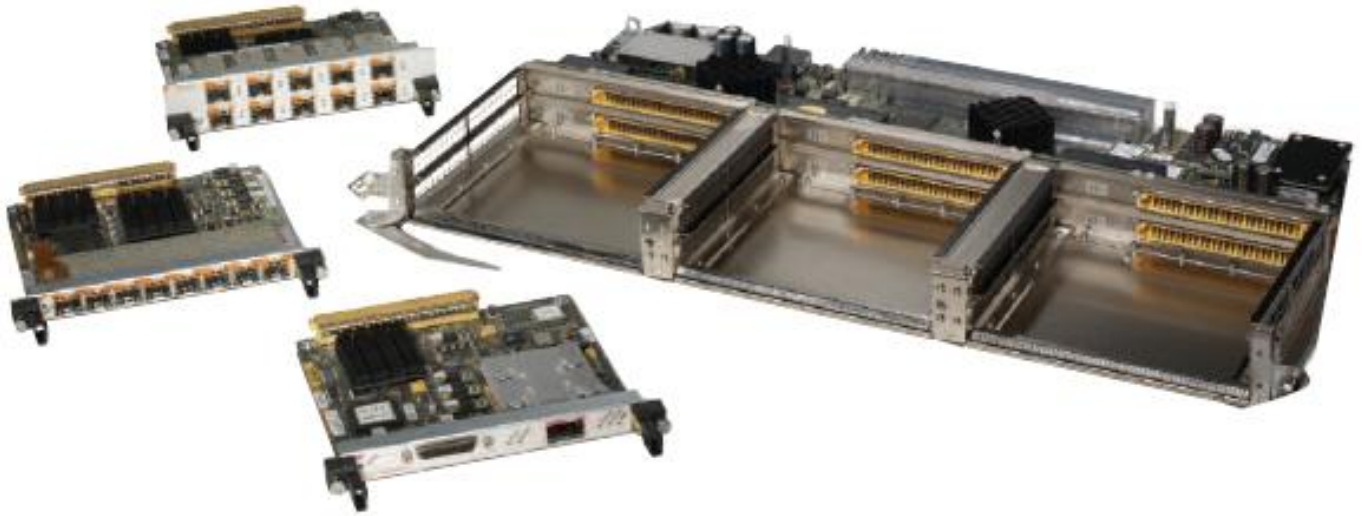
SPA & SIP



The relationship between Cisco XR 12000 and Cisco 12000

The Cisco XR 12000 Series and Cisco 12000 Series routers are:

- A portfolio of intelligent routing solutions that scale from 2.5- to 10-Gbps capacity per slot,
- Helping enable carrier-class IP/MPLS networks and accelerating your company's evolution to IP NGNs.
- Currently more than 500 customers use an installed base of more than 25,000 Cisco 12000 Series routers with Cisco IOS Software.

To meet the current and future needs of these customers, Cisco Systems® will continue to invest in Cisco IOS and Cisco IOS XR Software and in new hardware. The Cisco XR 12000 Series offers you a smooth upgrade path for your installed base of market-leading Cisco 12000 Series as you transition to a converged IP NGN infrastructure.

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IP NGN

- A sweeping transformation of both a service provider's entire network and its business.
- The IP NGN constantly evolves to adapt to customer demand and new technology opportunities.
- The Cisco IP NGN is about more than voice; it encompasses all of a service provider's current and future services. It is important to recognize that most growth will occur in services such as data and video.

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Cisco XR 12000 Series

Major Components

- Provides fully upgradable, single-chassis platforms ranging from 2.5- to 10-Gbps capacity per slot.
- Consists of the latest hardware advances of the Cisco 12000 Router, including the ISE line cards, the performance route processor (Cisco XR 12000 and 12000 Series Performance Route Processor-2 [PRP-2]), as well as the industry-proven chassis and multigigabit switch fabric.

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Cisco XR 12000 Multiservice Scale

- Cisco IOS XR Software distributes processing intelligence
- Dedicated queuing application-specific integrated circuits (ASICs) on each ISE line card
- Multicast replication

NEWOUTLOOK.IT

Cisco CRS-1 Single Shelf

- Supports standalone configurations of 320-Gbps and 640-Gbps systems enabling 40-Gbps per slot capacity in all form factors.
- Supports both fixed and modular line cards usable across all configurations. The fixed cards feature the world's first 40-Gbps (OC-768/STM-256) tunable WDMPOS and POS interfaces.
- Use Cisco IOS XR software
- The Cisco I-Flex design offers a portfolio of modular interfaces featuring shared port adapters (SPAs) and SPA interface processors (SIPs).

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Cisco CRS-1 Multishelf System

- Consists of 2 to 72, 40-Gbps-slot line-card shelves and 1 to 8 fabric shelves for a total switching capacity of up to 92 Tbps
- Supports in-service upgrade from single-shelf to multishelf configuration with the addition of 1 to 8 fabric shelves
- Protects investments by using modular services cards (MSCs) and physical layer interface modules (PLIMs) that are fully interchangeable across the entire CRS-1 product family
- Supports up to 1152 slots for MSCs, PLIMs, and distributed route processors
- Features line-card shelves connected to the fabric-card shelves supporting true fabric shelf redundancy, service-intelligent fabric queuing, and massive multicast replication scale

NEWOUTLOOK.IT

Models Comparison

Model	Slot Capacity	Aggregate Switching Capacity	Dimensions (H x W x D)
Cisco CRS-1 4-Slot Single-Shelf System	4 slots	320 Gbps	30 x 18.55 x 30.28 in. (76.2 x 47.12 x 76.91 cm) with front cover
Cisco CRS-1 8-Slot Single-Shelf System	8 slots	640 Gbps	38.5 x 17.5 x 36.6 in. (99.06 x 44.45 x 93.0 cm)
Cisco CRS-1 16-Slot Single-Shelf System	16 slots	1.2 Tbps	84 x 23.6 x 36 in. (213.36 x 59.94 x 91.44 cm)
Cisco CRS-1 Multishelf System	1152 slots	92 Tbps	—

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