



APPENDIX **A**

Technical Specifications

This appendix contains the following sections:

- [Product Architecture, page A-2](#)
- [Compliance Information, page A-5](#)
- [Regulatory, Compliance, and Safety Information, page A-8](#)

Product Architecture

Table A-1 lists system level requirements for the Cisco XR 12404 Router.

Table A-1 Cisco XR 12404 Router Product Architecture

Feature	Description
Slot Capacity	4 slots 3 OC-192 capable I/O slots 1 RP slot that is 10G capable 1 CSF/alarm card
Chassis	One card cage with five slots, three OC-192 pitch slots, one RP slot and one CSF slot
Height	Not to exceed 8.75 inches; supports 8 systems per 7 ft. rack
Width	19 inch rack mountable
Depth	27.85 in. (70.74 cm) maximum
Switching Capacity	10 Gbps full-duplex switching capacity per slot. This includes the RP slots. Each slot capable of supporting all current and future Engine 0, Engine 1, Engine 2, Engine 3 and Engine 4 based line cards. Specific interfaces include OC-192c, QOC-48c, 10GE, 10x1GE, 3xGE, 1xGE, 8xFE, and other 10GiG cards. The switching capacity is required to handle all four 10GiG capable slots (including RP), thus the total switching capacity will be 80 Gbps full-duplex
Cooling	Side-to-side cooling
Power Supplies	110V AC 220V AC DC (optional)

Table A-1 Cisco XR 12404 Router Product Architecture (continued)

Feature	Description
Power Requirements	110V AC power, sufficient to manage three OC-192c/10GE capable line cards and one 10G capable RP. Total power supplied to the system should not exceed 1200VA Two AC or DC power supplies in redundant configuration should be able to support the entire power needs of the chassis.
Power Supply Redundancy	Redundant and load sharing AC power entry module (PEMs), or Redundant and load sharing DC PEMs and DC power distribution units (PDUs)
Route Processors	Supports up to 2 RPs per system The second RP can be used in any slot ¹ The first RP is inserted in slot 0 (1.25 inch height)
Route Processor Redundancy	Supports online insertion and removal, hot swappable RP redundancy
Switch Fabric	The switch fabric supports up to 80 Gbps of capacity
NEBS	The Cisco 12404 Internet Router is designed to comply with NEBS Level 3 certification

1. A narrow card filler panel must be used to ensure proper air flow through the chassis and electromagnetic compatibility (EMC)

Specifications

[Table A-2](#) lists Cisco XR 12404 Router physical specifications. [Table A-3](#) lists the environmental specifications.

Table A-2 Cisco XR 12404 Router Physical Specifications

Description	Value
Frame height	8.75 inches (22.2 cm)
Frame width	19 inches (48.3 cm)
Frame depth	26 inches (66.0 cm)
Weight	
Maximum configuration	103 pounds (46.7 kg)
Minimum configuration	73 pounds (33.1 kg) (without line cards)

Table A-3 Cisco XR 12404 Router Environmental Requirements

Environmental Requirements	Ranges
Temperature	32 to 104F (0 to 40 C) operating -4 to 149F (-20 to 65 C) non-operating -5 to 133F (-23 to 55 C) Max operating for 96 hrs. only
Humidity	10 to 90% non-condensing operating 5 to 95% non-condensing non-operating
Altitude	0 to 10,000 ft. (0 to 3,050 m) operating 0 to 30,000 ft. (0 to 9,144 m) non-operating
Heat dissipation	3,343 Btu/hr. maximum
Cooling	Facing the router, right side-to-side cooling
Shock	5 to 500 Hz, 0.5g (0.1 oct/min ¹) operating 5 to 100Hz, 1g (0.1 oct/min) non-operating 100 to 500Hz, 15g (0.2 oct/min) 500 to 1,000Hz, 1.5g (0.2 oct/min)

1. oct/min = Octave per minute

**Caution**

Exhaust from other equipment vented directly into the Cisco XR 12404 Router air inlet may cause overheating. Install the router so that it is protected from a direct flow of hot air from other equipment.

Compliance Information

Compliance information for the Cisco XR 12404 Router is presented in the following tables:

- [Table A-4, “Electromagnetic Emissions Requirements”](#)
- [Table A-5, “Immunity Tests”](#)
- [Table A-6, “Network Equipment Building Systems—NEBS”](#)
- [Table A-7, “European Telecommunication Standards Institute—ETSI”](#)
- [Table A-8, “Safety Approval Requirement”](#)

Table A-4 ***Electromagnetic Emissions Requirements***

Country	Standard Requirements	Class: Up to 1 GHz
Australia	AS/NZS 3548:1995	A
Canada	ICES003-1998/CISPR22:1996	A
Hungarian	MSZEN55022	A
Japan	VCCI V-3/99.04	A
Korea	EN55022-1998/EN50082-1	A
New Zealand	AS/NZS 3548:1995	A
Singapore	CISPR22:1996	A
Taiwan	BSMI/CNS 13438	A
USA	FCC CFR 47-PART 15 1998	A ¹
China/others	CISPR22:1997	A
Europe/EU	EN55022-1998/EN55024-ITE	B

Compliance Information

Table A-4 Electromagnetic Emissions Requirements (continued)

Country	Standard Requirements	Class: Up to 1 GHz
ETSI	EN 300386-2/EN55022	B (Noncentral office)

1. Up to 40 GHz

Table A-5 Immunity Tests

Test Type or Specification	Applies to	Class/Level/Criteria
Electrostatic Discharge EN61000-4-2:1995	System/enclosure	Level 4/8KV contact, 15KV air/B
Radiated Immunity IEC61000-4-3:1995 ENV50140:1993	System/enclosure	Level 3/10V/m/A 1KHz 80% AM (80MHz - 1 GHz)
Fast Transients EN61000-4-4:1995	AC power lines DC lines Signal lines	Level 4/4KV 2.5 kHz Rep Freq/B Level 4/4KV 2.5 kHz Rep Freq/B Level 4/1KV 5kHz Rep Freq/A Level 4/2 KV 5kHz Rep Freq/B
Surge Immunity EN61000-4-5:1995	AC power line (live-neutral) 2 ohms AC power line (live-earth) 12 ohms DC power line (live-earth) DC Power line (return-earth) Signal lines 2 ohms	Class 4/2KV/B Class 4/4KV/B Class 4/500V/B Class 4/500V/B Indoor: 500V Outdoor: 4KV/R

Table A-5 Immunity Tests (continued)

Test Type or Specification	Applies to	Class/Level/Criteria
Conducted RF Immunity EN61000-4-6:1996+ ENV50141:1993	AC power line DC power line Signal lines	Level 3/10V/A (150kHz-80MHz)
Voltage Dips + Sag Interruptions AC Power Lines EN61000-4-11:1995	AC power lines	30% 10 ms (0.5 Period)/B 30% 5000ms (25 Periods) 60% 100 ms (5 Periods)/C 60% 1000 ms (50 Periods) >95% 10ms (0.5 Period)/C >95% 5000 ms (250 Periods)

Table A-6 Network Equipment Building Systems—NEBS**NEBS Requirements**

SR-3580—NEBS criteria levels (Level 3-compliant)

GR-1089-Core—NEBS EMC and safety

GR-63-Core—NEBS physical protection

Table A-7 European Telecommunication Standards Institute—ETSI**ETSI Specifications**

ETS 300 386-1—Levels for equipment with a “high priority of service” that is installed in “locations other than telecommunication centers.”

ETS 300 386-2:1997—Levels for equipment with a “high priority of service” that is installed in “locations other than telecommunications centers.”

ETSI 300 132-2: September 1996—DC power supply interfaces at the input to telecommunications equipment Sections 4.8, 4.9.

Table A-8 Safety Approval Requirement

Category	Approval Agency and Requirement
Safety Certification	UL 1950 CSA-22.2 No. 950 EN60950 ACA TS001 AS/NZS 3260 IEC60950 EN60825

Regulatory, Compliance, and Safety Information

This section includes regulatory, compliance, and safety information in the following sections:

- [Translated Safety Warnings and Agency Approvals, page A-8](#)
- [Electromagnetic Compatibility Regulatory Statements, page A-8](#)

Translated Safety Warnings and Agency Approvals

The complete list of translated safety warnings and agency approvals is available in the *Regulatory Compliance and Safety Information for Cisco 12000 Series Routers* publication (Document Number 78-4347-19).

Electromagnetic Compatibility Regulatory Statements

FCC Class A Compliance

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

Modifying the equipment without Cisco authorization may result in the equipment no longer complying with FCC requirements for Class A digital devices. In that event, your right to use the equipment may be limited by FCC regulation and you may be required to correct any interference to radio or television communication at your own expense.

You can determine whether your equipment is causing interference by turning it off. If the interference stops, it was probably caused by the Cisco equipment or one of its peripheral devices. If the equipment causes interference to radio or television reception, try to correct the interference by using one or more of the following measures:

- Turn the television or radio antenna until the interference stops.
- Move the equipment to one side or the other of the television or radio.
- Move the equipment farther away from the television or radio.
- Plug the equipment into an outlet that is on a different circuit from the television or radio. (That is, make certain the equipment and the television or radio are on circuits controlled by different circuit breakers or fuses.)

CISPR 22

This apparatus complies with CISPR 22/EN55022 Class B radiated and conducted emissions requirements.

Canada

English Statement of Compliance

This class A digital apparatus complies with Canadian ICES-003.

French Statement of Compliance

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Europe—EU

This apparatus complies with EN55022 Class B and EN55024 standards when used as ITE/TTE equipment, and EN300386 for Telecommunications Network Equipment (TNE) in both installation environments, telecommunication centers and other indoor locations.

VCCI Class A Notice for Japan



Warning

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

Statement 191

警告 これは、情報処理装置等電波障害自主規制協議会（VCCI）の規定に基づくクラスA装置です。この装置を家庭環境で使用すると、電波妨害を引き起こすことがあります。この場合には、使用者が適切な対策を取るよう要求されることがあります。

Class A Notice for Hungary



Warning

This equipment is a class A product and should be used and installed properly according to the Hungarian EMC Class A requirements (MSZEN55022). Class A equipment is designed for typical commercial establishments for which special conditions of installation and protection distance are used. Statement 256

Figyelmeztetés a felhasználói kézikönyv számára: Ez a berendezés "A" osztályú termék, felhasználására és üzembe helyezésére a magyar EMC "A" osztályú követelményeknek (MSZ EN 55022) megfelelően kerülhet sor, illetve ezen "A" osztályú berendezések csak megfelelő kereskedelmi forrásból származhatnak, amelyek biztosítják a megfelelő speciális üzembe helyezési körülményeket és biztonságos üzemelési távolságok alkalmazását.

Class A Notice for Taiwan and Other Traditional Chinese Markets



Warning

This is a Class A Information Product, when used in residential environment, it may cause radio frequency interference, under such circumstances, the user may be requested to take appropriate countermeasures. Statement 257

警告 這是甲類資訊產品，在居住環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Class A Notice for Korea

**Warning**

This is a Class A Device and is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this type was sold or purchased by mistake, it should be replaced with a residential-use type.

Statement 294

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