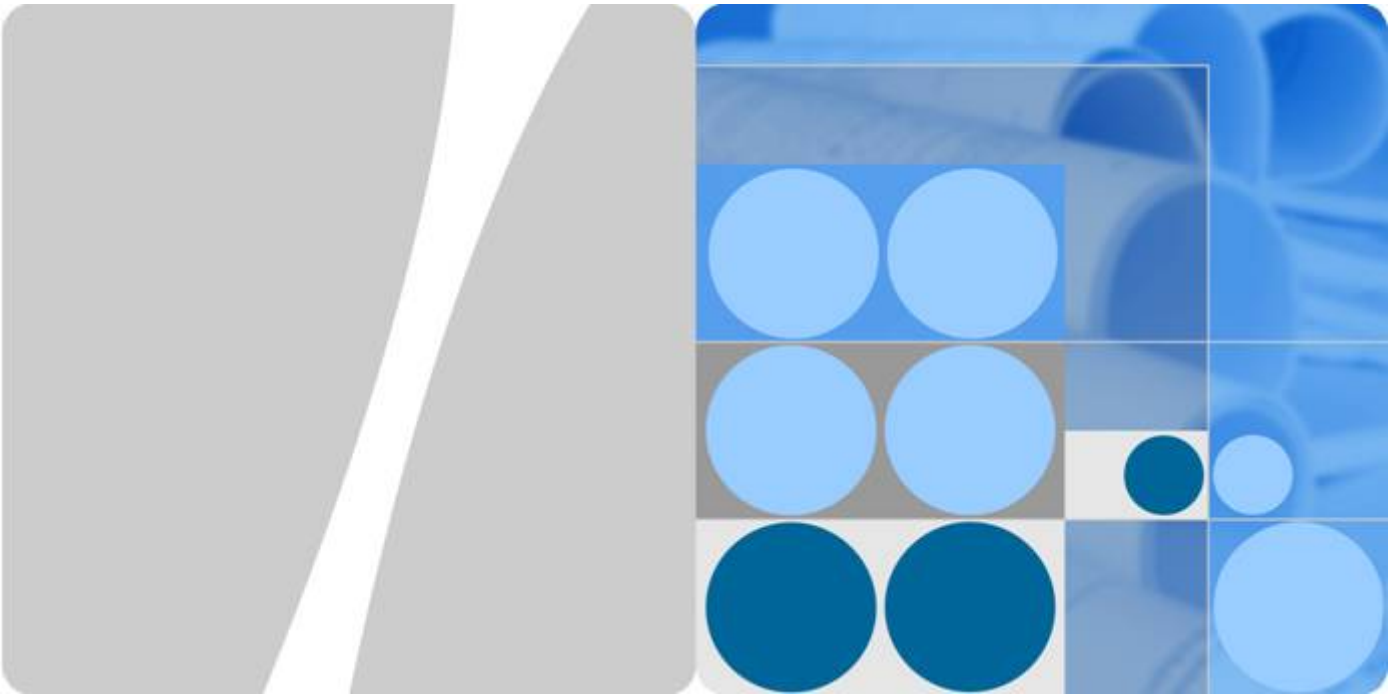

CX620 Switch Module

V100R001

White Paper

Issue 03

Date 2017-03-27

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About This Document

Purpose

This document describes the E9000 CX620 IB switch module (CX620 for short) in terms of its functions, advantages, appearance, specifications, internal networking, standards and certifications. You can learn about the CX620 by reading this document.

Intended Audience

This document is intended for:

- Huawei presales engineers
- Channel partner presales engineers
- Huawei enterprise presales engineers

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
DANGER	**DANGER** indicates a hazard with a high level or medium level of risk which, if not avoided, could result in death or serious injury.
WARNING	**WARNING** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
CAUTION	**CAUTION** indicates a potentially hazardous situation that, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.
TIP	**TIP** indicates a tip that may help you solve a problem or save time.
NOTE	**NOTE** provides additional information to emphasize or supplement important points of the main text.

Change History

Issue 03 (2017-03-27)

This issue is the third official release.

Mode	Change Description
Added	Added product model descriptions to **1.3 Appearance**.

Issue 02 (2016-03-03)

This issue is the second official release.

Mode	Change Description
Modified	Changed the altitude in **1.8 Technical Specifications**.
Added	Added the description about the working temperature's compliance with the ASHRAE Class A3 standard in **1.8 Technical Specifications**.

Issue 01 (2016-09-13)

This issue is the first official release.

Contents

1 Overview

About This Chapter

1.1 Functions

This topic describes the functions and ports of the CX620 switch module.

The E9000 CX620 Switch Module (CX620 for short) is the Infiniband (IB) switch module of the E9000 server and provides external IB ports for the compute nodes, storage nodes, or service process nodes installed in the front slots of the E9000. Each CX620 provides up to 18 IB ports on the panel and up to 16 IB ports on the backplane. It also can monitor the hardware operating, software operating and operating environment.

1.2 Advantages

This topic describes the advantages of the CX620 switch module.

The CX620 switch module provides various ports (40 Gbit/s,56 Gbit/s, and 100 Gbit/s) and delivers high performance.

Various Ports (40 Gbit/s, 56 Gbit/s, and 100 Gbit/s)

Underpinned by the leading hardware platform, the CX620 provides high-density ports and and a line-speed forwarding capability.

CX620 provides the external ports as follows:

- BMC serial port: The serial port is used to debug the baseboard management controller (BMC) module and the baud rate of 115200 bit/s.
- 18 QSFP+ ports: These ports are used to connect to the external network. One green indicator is provided for each port.

CX620 provides 16 EDR ports for connecting to the mezzanine cards on the 16 half-width or eight full-width nodes.

High Performance

The CX620 has the following advantages in performance:

- 100 Gbit/s bandwidth
- 6.8 TB switching capacity
- 90 ns time delay
- A built-in switch chip and NIC, removing the need for cables
- Co-Design Scalable Hierarchical Aggregation and Reduction Protocol (SHARP)

1.3 Appearance

This topic describes the CX620 in terms of its appearance, panel, and installation positions in the chassis.

Appearance

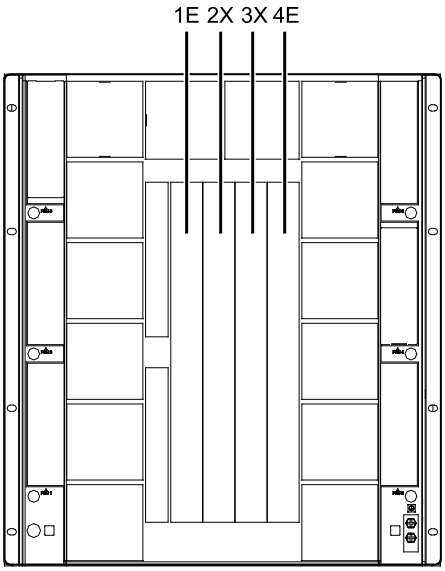
Figure 1-1 shows the CX620.

Figure 1-1 Appearance

Installation Positions

The CX620 is installed in a rear slot of the E9000 chassis. **Figure 1-2** shows the positions and slots for installing the CX620s in a chassis.

Figure 1-2 Installation positions and slots



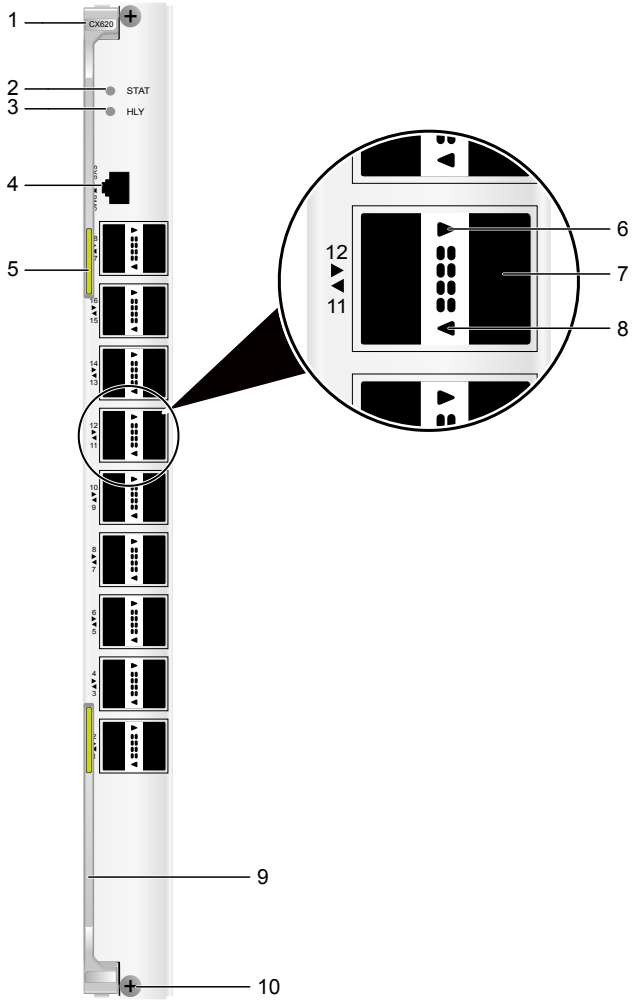
NOTE

The CX620 panel provides more ports than other switch modules. For ease of cable routing and maintenance, you are advised to install the CX620 in slot 1E or 4E.

Panel

Figure 1-3 shows the CX620 panel.

Figure 1-3 Panel



1	Product Model	2	STAT indicator
3	HLY indicator	4	BMC serial port
5	Customization label (with an ESN label)	6	Status indicator of the right optical port
7	Optical port (QSFP+)	8	Status indicator of the left optical port
9	Ejector lever	10	Captive screw

NOTE

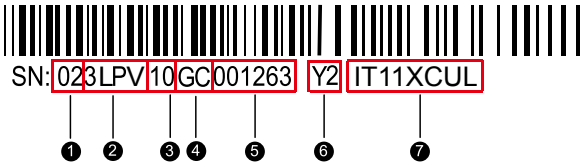
The numbers on the left side are port serial numbers. The arrow direction of a triangle indicates the direction of a port.

SNs

A serial number (SN) is a string that uniquely identifies a product. An SN is required when you apply for technical support from Huawei.

Figure 1-4 shows the SN format.

Figure 1-4 SN example



No.	Description
1	Indicates the category code (two characters).
2	Indicates the last four characters of the item identification code.
3	Indicates the vendor code (two characters).
4	Indicates the year and month (two characters). The first character indicates the year. The digits 1 to 9 indicate 2001 to 2009, and the letters A to Z indicate 2010 to 2035. The second character indicates the month. The digits 1 to 9 indicate January to September, and the letters A to C indicate October to December.
5	Indicates the sequence number (six digits).
6	Indicates RoHS compliance (two characters).
7	Indicates the internal model number of the board.

1.4 Ports

This topic describes the name, type, quantity, description, and the naming rules of the ports on the CX620.

Overview

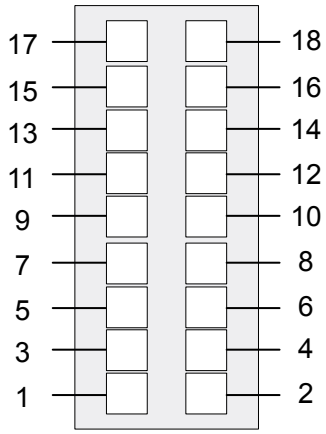
Table 1-1 describes the external ports on the CX620.

Table 1-1 Ports

Port	Type	Quantity	Description
BMC serial port	RJ-45	1	The serial port is used to debug the baseboard management controller (BMC) module and the baud rate of 115200 bit/s.
Optical port	QSFP+	18	These ports are used to connect to the external network. One green indicator is provided for each port.

Figure 1-5 shows the CX620 port naming rules.

Figure 1-5 Port naming rules



1.5 Indicators

This topic describes the names, meanings, colors, descriptions and working status of the indicators on the CX620.

You can observe the indicators to determine the current operating status of the CX620. **Table 1-2** describes the indicators.

Table 1-2 Indicators

Indicator	Meaning	Color	Description
STAT indicator	Power status indicator	Green	● Off: The module is not powered on. ● Blinking green: The module is being powered on. ● Steady green: Power is properly supplied to the module.

Indicator	Meaning	Color	Description
HLY indicator	Healthy indicator	Red and green	● Off: The module is not powered on. ● Steady green: The module is working properly. ● Blinking red (1 Hz): A major alarm is generated. ● Blinking red (4 Hz): A critical alarm is generated. ● Blinking red (5 Hz): The CX620 is not installed properly. **NOTE** It is difficult to distinguish a blinking frequency of 4 Hz from a blinking frequency of 5 Hz. When the HLY indicator is quickly blinking red, you are advised to check whether the device is securely inserted and then check whether a critical alarm is generated.
Status indicator of the optical port	The status indicator of the optical port	Green	● Off: The port is not properly connected, or the **opensm** command is not executed in the OS. ● Steady green: The port is properly connected. ● Blinking green: Data is being sent or received over the port.

1.6 Networking in the Chassis

This topic describes the networking between the CX620 and other devices in the chassis.

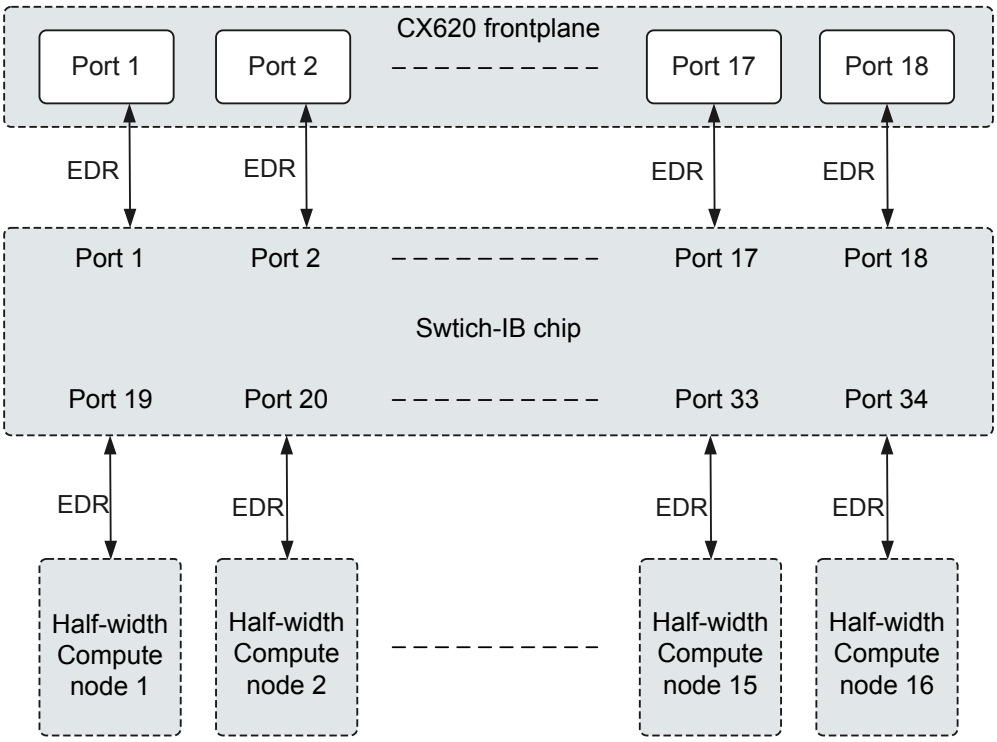
Switch Chip Port Allocation

The 34 ports for the CX620 are provided by the Switch-IB chip, numbered 1 to 34. The ports are allocated as follows:

- Eighteen EDR ports (1 to 18) on the panel connect to external devices.
- Sixteen EDR ports (19 to 34) connect to the mezzanine cards on the 16 half-width or eight full-width nodes.

Figure 1-6 shows the allocation of the ports provided by the Switch-IB chip.

Figure 1-6 Port allocation



NOTE

The mapping between full-width nodes and ports is the same as the mapping between half-width nodes in corresponding slots and ports.

Port mapping between switch modules and mezzanine cards

Port mapping between the CX620s and the mezzanine cards

Mezz1 and Mezz3 each connect to four EDR ports of the CX620 switch modules in slots 2X and 3X. Mezz2 and Mezz4 each connect to four EDR ports of the CX620 switch modules in slots 1E and 4E.

Figure 1-7, **Figure 1-8**, **Figure 1-9**, and **Figure 1-10** show the port mapping between the CX620s and the mezzanine cards.

Figure 1-7 Port mapping between the CX620s and the MZ611 mezzanine cards

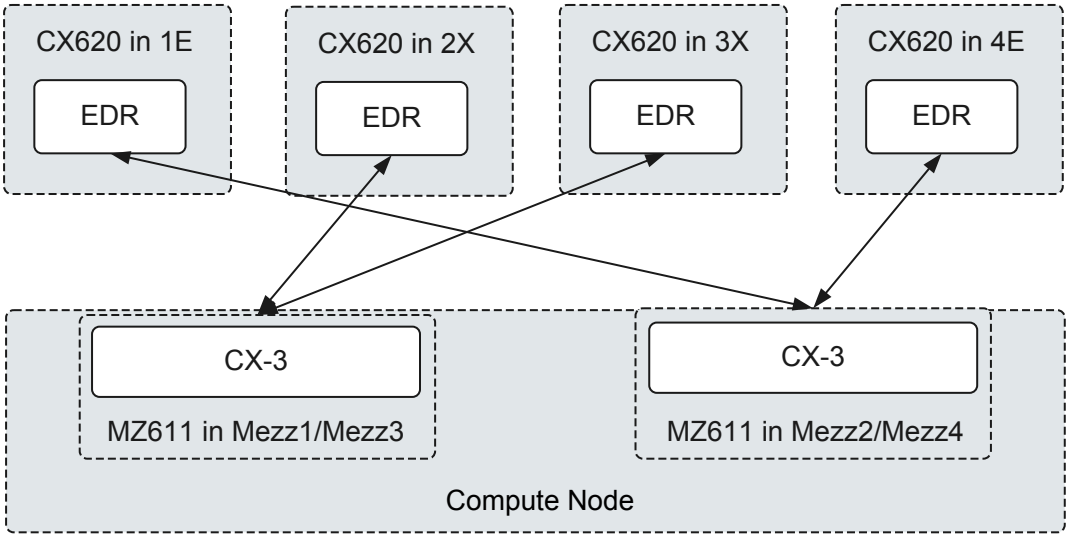


Figure 1-8 Port mapping between the CX620s and the MZ612 mezzanine cards

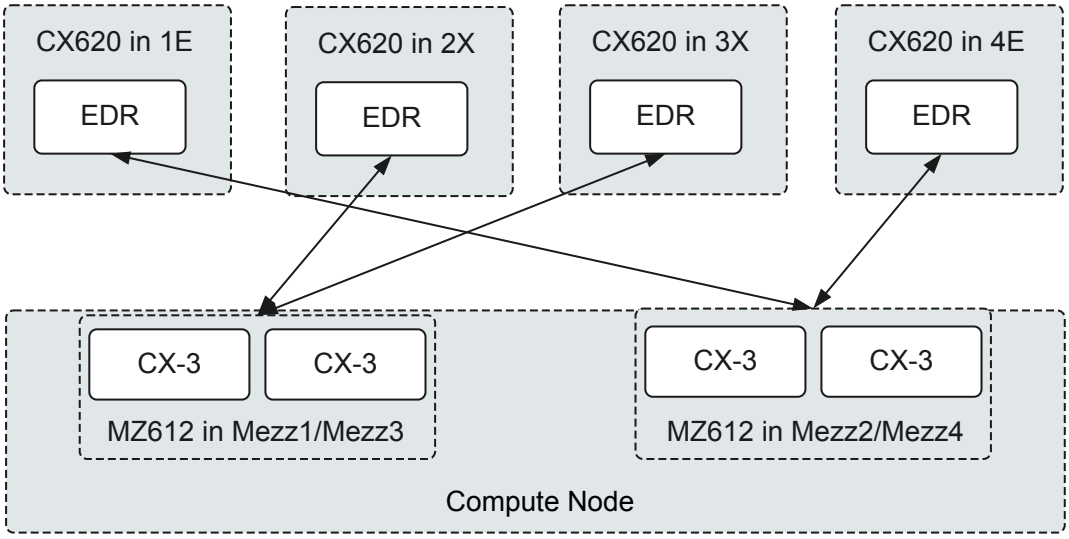


Figure 1-9 Port mapping between the CX620s and the MZ620 mezzanine cards

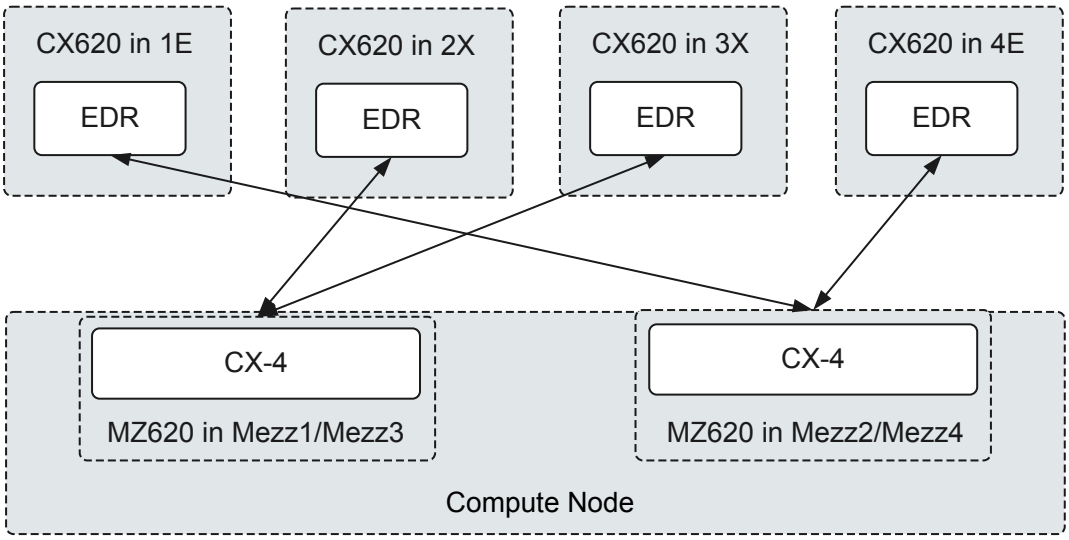
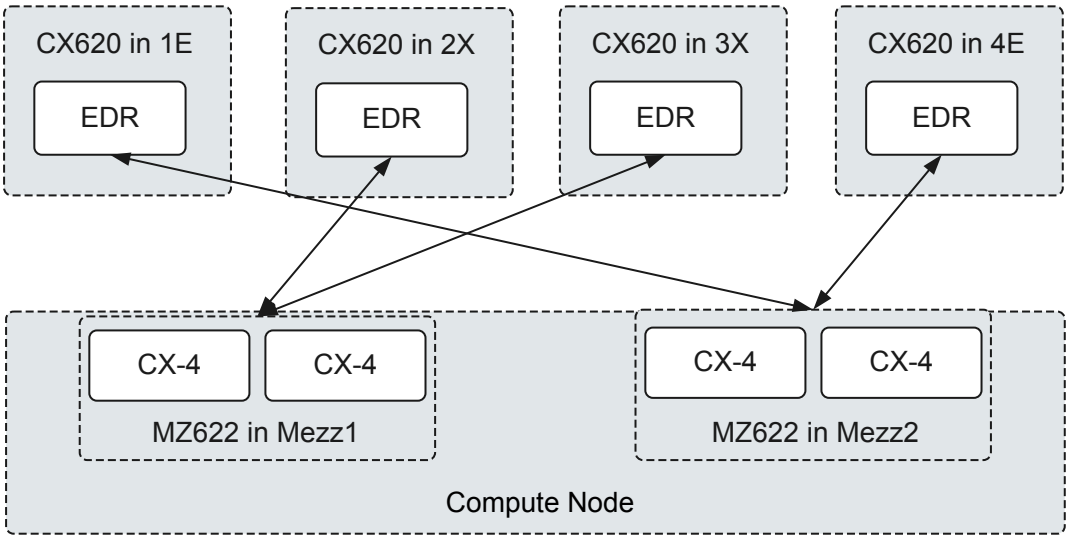


Figure 1-10 Port mapping between the CX620s and the MZ622 mezzanine cards



1.7 Software and Hardware Compatibility

This topic describes the software and hardware supported by the CX620.

For details about the software and hardware that are compatible with the CX620, see ***Huawei Server Compatibility Checker***.

Supported Mezzanine Cards

Table 1-3 describes the mezzanine cards supported by the CX620.

Table 1-3 Mezzanine cards supported by the CX620

Module	Description
MZ611	2–port IB fourteen data rate (FDR) mezzanine card
MZ612	2–port IB fourteen data rate (FDR) mezzanine card
MZ620	2–port IB enhanced data rate (EDR) mezzanine card
MZ622	2–port IB enhanced data rate (EDR) mezzanine card

Supported Cables and Transceivers

Table 1-4 describes the cables and transceivers supported by the CX620.

Table 1-4 Cables and transceivers supported by the CX620

Cable or Transceiver	Description
QSFP+ AOC cable (EDR)	Date rate: EDR; cable length: AOC active optical cable of 5 m, 10 m, or 20 m
QSFP+ DAC cable (EDR)	Date rate: EDR cable: 1 m or 3 m direct attached cable (DAC)
QSFP+ AOC cable (FDR)	Date rate: FDR; cable length: AOC active optical cable of 3 m, 5 m, 10 m, 15 m, 20 m, or 30 m
QSFP+ DAC cable (FDR)	Date rate: FDR; cable: 3 m DAC
Console cable	Supports an RJ45 port and serves as the connection cable for an RS232 serial port

The CX620 supports various pluggable optical modules and DACs. You can choose optical modules and DACs based on site requirements.

- The CX620 provides the following functions for EDR applications:
  - Provides QSFP+ optical ports and supports IB-dedicated EDR optical modules.
  - Supports 1 m or 3 m QSFP+ DACs for connections.
- The CX620 provides the following functions for FDR applications:
  - Provides QSFP+ optical ports and supports IB-dedicated FDR optical modules.
  - Supports 3 m QSFP+ DACs for connections.

1.8 Technical Specifications

This topic describes the physical, environmental, and power specifications of the CX620.

Table 1-5 describes the CX620 technical specifications.

Table 1-5 Technical Specifications

Category	Item	Specifications
Physical specifications	Dimensions (H x W x D)	388.55 mm x 35.06 mm x 272.15 mm (15.30 in. x 1.38 in. x 10.71 in.)
	Color	Silver white
	Weight	2.9 kg
Environmental specifications	Temperature	● Operating temperature: 5°C to 40°C (41°F to 104°F) (ASHRAE Class A3 compliant) ● Storage temperature: -40°C to +65°C (-40°F to +149°F) ● Long-term storage temperature: 21°C to 27°C (69.8°F to 80.6°F)
	Temperature change rate	15°C/h (27°F/h)
	Humidity	● Operating humidity: 5% RH to 85% RH (non-condensing) ● Storage humidity: 5% RH to 95% RH (non-condensing) ● Long-term storage humidity: 30% RH to 69% RH (non-condensing)
	Altitude	At an altitude of 900 m (2952.72 ft), the highest operating temperature is 40°C (104°F). When the device is used at an altitude of 900 m to 5000 m, the highest operating temperature decreases by 1°C (1.8°F) as the altitude increases by 300 m (984.24 ft).
Input power supply	Rated input voltage	12 V DC
Power consumption	Maximum power consumption	154 W

2 Standards and Certifications

About This Chapter

2.1 Standards Compliance

This topic describes the international and industrial standards and communication protocols that the CX620 complies with.

International Standards

Table 2-1 lists the international standards.

Table 2-1 Standards and protocol compliance

Standard	Protocol
IBTA1.3	IB Trade Association 1.3

Industrial Standards

Table 2-2 lists the industrial standards.

Table 2-2 Industrial standards

Organization	Standard
ECMA TR/70	Environment protection
EN60950	Safety (Europe)
GR-929	Reliability
IEC60297	Chassis compliance
IEC60950	Safety
IEC60825-1/2/6	Safety
IEC60215	Safety
IEC61000	EMC standard
IEC 863	Reliability, maintainability, and availability compliance standard
Telcordia SR-332	Reliability
UL60950	Safety (North America)

Communication Protocols

Table 2-3 lists the communication protocols.

Table 2-3 Communication protocols

Protocol	Description
ARP	Address Resolution Protocol
FTP	File Transfer Protocol
HTTP	Hypertext Transfer Protocol
ICMP	Internet Control Message Protocol
IP	Internet Protocol
IPMI	Intelligent Platform Management Interface
NTP	Network Time Protocol
SNMP	Simple Network Management Protocol
SSH	Secure Shell
SSL	Secure Socket Layer
TCP	Transmission Control Protocol
TELNET	Remote terminal protocol
TFTP	Trivial File Transfer Protocol
UDP	User Datagram Protocol

2.2 Certifications

This topic describes the certifications that the E9000 has passed.

Table 2-4 lists the certifications.

Table 2-4 Certifications

Country /Region	Certification	Standard
Europe	WEEE	2002/96/EC, 2012/19/EU
Europe	RoHS	2002/95/EC, 2011/65/EU, EN 50581: 2012
Europe	REACH	EC NO. 1907/2006

Country /Region	Certification	Standard
Europe	CE	Safety: EN 60950-1: 2006+A11: 2009+A1: 2010+A12: 2011 EMC: ● EN 55022: 2010 ● CISPR 22: 2008 ● EN 55024: 2010 ● CISPR 24: 2010 ● ETSI EN 300 386 V1.6.1: 2012 ● ETSI ES 201 468 V1.3.1: 2005
China	RoHS	SJ/T-11363-20006 SJ/T-11364-20006 GB/T 26572-2011
China	China Environmental Labeling	GB/T24024: 2001 idt ISO14024: 1999 HJ 2507-2011
Australia	C-tick	AS/NZS CISPR22: 2009
America	UL	UL 60950-1
America	FCC	FCC Part 15 (Class A)
America	NTRL-UL	UL 60950-1, 2nd Edition, 2011-12-19 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No.60950-1-07, 2nd Edition, 2011-12 (Information Technology Equipment-Safety-Part 1: General Requirements)
Canada	IC	ICES-003 Class A
Nigeria	SONCAP	IEC 60950-1: 2005 (2nd Edition) + A1: 2009 EN 60950-1: 2006+A11: 2009+A1: 2010 + A12: 2011
Kingdom of Saudi Arabia (KSA)	SASO	IEC 60950-1: 2005 (2nd Edition) + A1: 2009 EN 60950-1: 2006+A11: 2009+A1: 2010 + A12: 2011
Global	CB	IEC 60950-1
Japan	VCCI	VCCI V-4: 2012