

# Huawei CX820 Switch Module V100R001

## White Paper

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# About This Document

## Purpose

This document describes the functions, advantages, appearance, specifications, and chassis networking of the CX820 switch module.






## Intended Audience

This document is intended for:

- Huawei presales engineers
- Channel partner presales engineers
- Enterprise presales engineers

## Symbol Conventions

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

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

## Change History

**Table 1**

Issue	Date	Description
01	2017-11-29	This issue is the first official release.

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# 1 Overview

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## About This Chapter

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- [1.2 Advantages](#)
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- [1.6 Internal Networking of a Chassis](#)
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## 1.1 Functions

The CX820 is an Omni-Path Architecture (OPA) switch module of the E9000 server, centrally providing external OPA ports for E9000 compute nodes. The CX820 provides up to 20 OPA ports on the panel and up to 16 internal OPA ports to connect to compute nodes.

## 1.2 Advantages

Major advantages include high-speed ports (100 Gbit/s) and high performance.

### High-Speed Port (100 Gbit/s)

Underpinned by the leading hardware platform, the CX820 provides high-speed ports and line-speed forwarding capability.

Ports on the CX820 panel:

- One BMC port is used to access the BMC. The baud rate is 115200 bit/s.



- 20 QSFP+ ports are used to connect to external devices. Each port has a green indicator.

The CX820 provides 16 internal OPA ports for connecting to 16 half-width or eight full-width compute nodes.

## High Performance

Advantages in performance:

- 100 Gbit/s ultra-large bandwidth
- 7.2 Tbit/s switching capacity
- 90 ns low latency

# 1.3 Appearance

## Appearance

**Figure 1-1** shows the CX820.

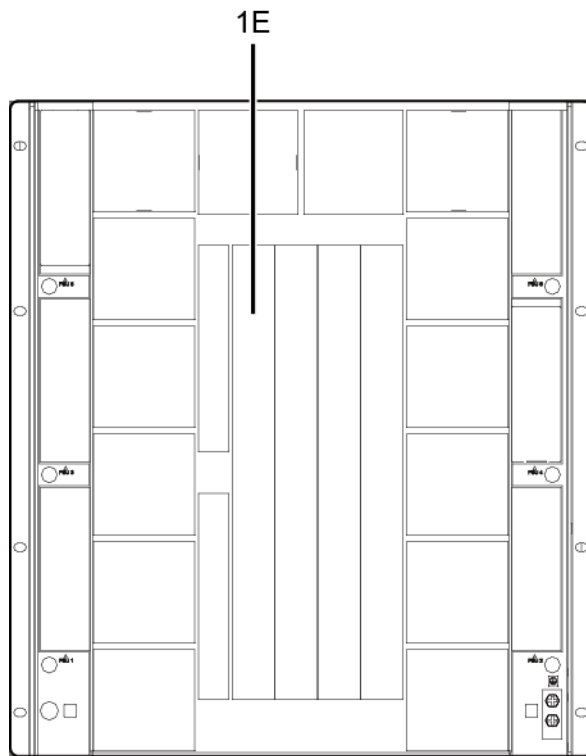
**Figure 1-1** Appearance



## Installation Position

The CX820 can only be installed in slot 1E at the rear of the E9000 chassis.

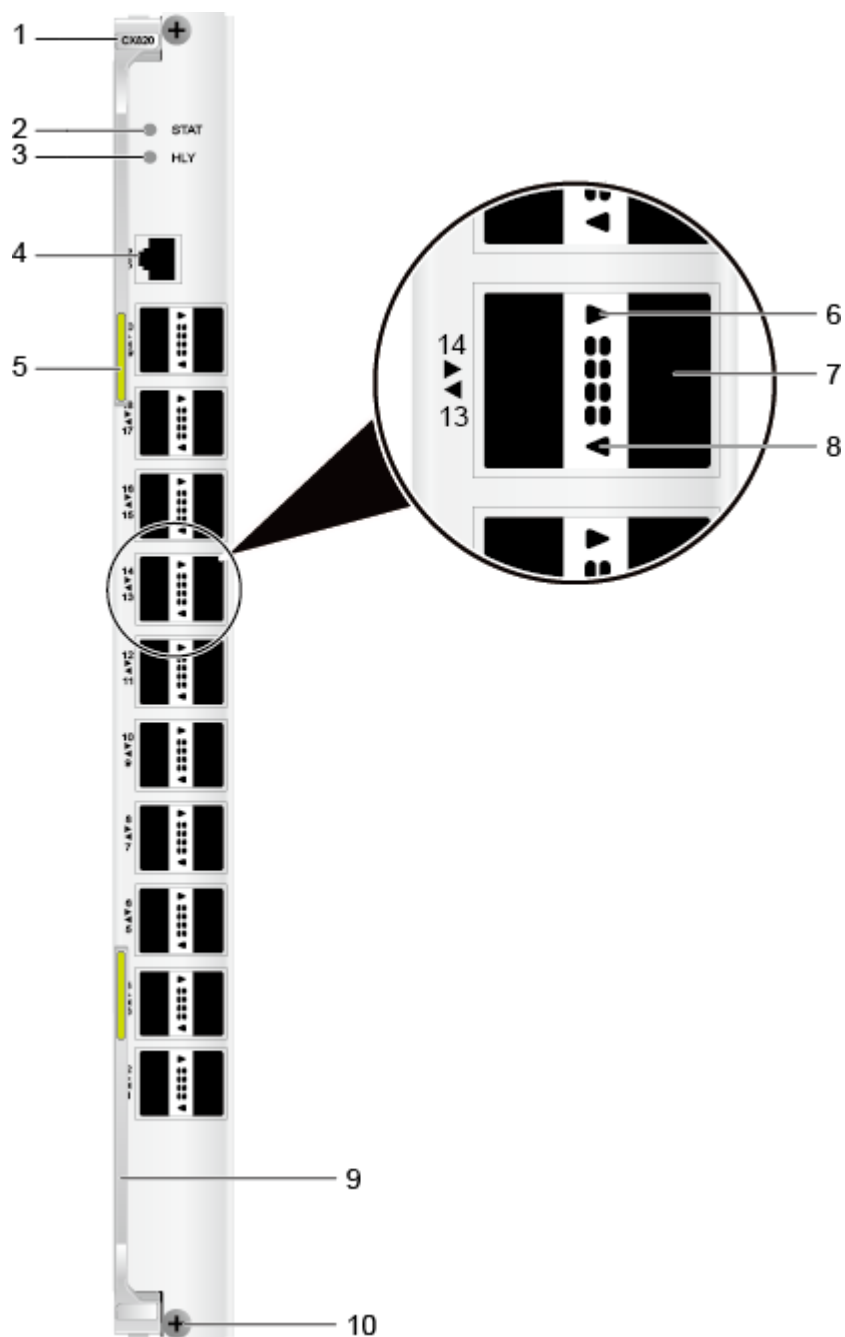
**Figure 1-2** Installation position



## Panel

**Figure 1-3** shows the panel of the CX820.

Figure 1-3 Panel



1	Product model	2	Power indicator
3	Health indicator	4	BMC serial port
5	Slide-out information label (with an ESN label)	6	Status indicator for the right port
7	QSFP+ port	8	Status indicator for the left port
9	Ejector lever	10	Captive screw

 **NOTE**

The numbers on the left of the panel are port numbers. The triangle mark directions indicate the port positions.

## SNs

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

**Figure 1-4** shows the SN format.

**Figure 1-4** SN format



No.	Description
1	Category code (two characters)
2	Last four characters of the item identification code
3	Vendor code (two characters)
4	Year and month of production (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	Serial number (six digits)
6	RoHS compliance (two characters)
7	Internal model number of the switch module

## 1.4 Ports

### Overview

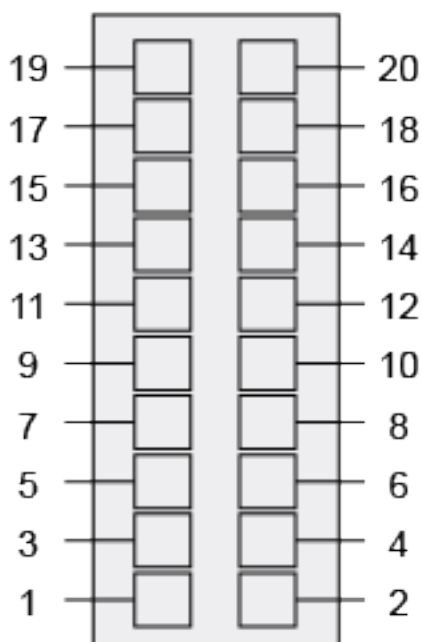
**Table 1-1** describes the external ports on the CX820.

**Table 1-1** Ports

Name	Type	Quantity	Description
BMC serial port	RJ45	1	Used for BMC commissioning. The baud rate is 115200 bit/s.
Service port	QSFP+	20	Used to connect to external devices. Each port has a green indicator.

**Figure 1-5** shows the port numbers.



**Figure 1-5** Port numbering



## 1.5 Indicators

The indicators on the CX820 display its working status. **Table 1-2** describes indicators on the CX820.

**Table 1-2** Indicators

Silkscreen	Meaning	Color	Description
STAT	Power status indicator	Green	<ul style="list-style-type: none"> <li>● Off: The switch module is not powered on.</li> <li>● Blinking green: The switch module is being powered on.</li> <li>● Steady green: The switch module is operating properly.</li> </ul>
HLY	Health indicator	Red and green	<ul style="list-style-type: none"> <li>● Off: The switch module is not powered on.</li> <li>● Steady green: The switch module is operating properly.</li> <li>● Blinking red at 1 Hz: A major alarm has been generated.</li> <li>● Blinking red at 4 Hz: A critical alarm has been generated.</li> <li>● Blinking red at 5 Hz: The switch module is not securely installed.</li> </ul> <p><b>NOTE</b> It is difficult to identify the difference between blinking frequencies of 4 Hz and 5 Hz. If the indicator is blinking red quickly, you are advised to check whether a compute node has been properly installed and then check whether an alarm has been generated.</p>
 and 	Service port status indicator	Green	<ul style="list-style-type: none"> <li>● Off: The port is not connected.</li> <li>● Steady green: The port is properly connected.</li> <li>● Blinking green: Data is being transmitted over the port.</li> </ul>

## 1.6 Internal Networking of a Chassis

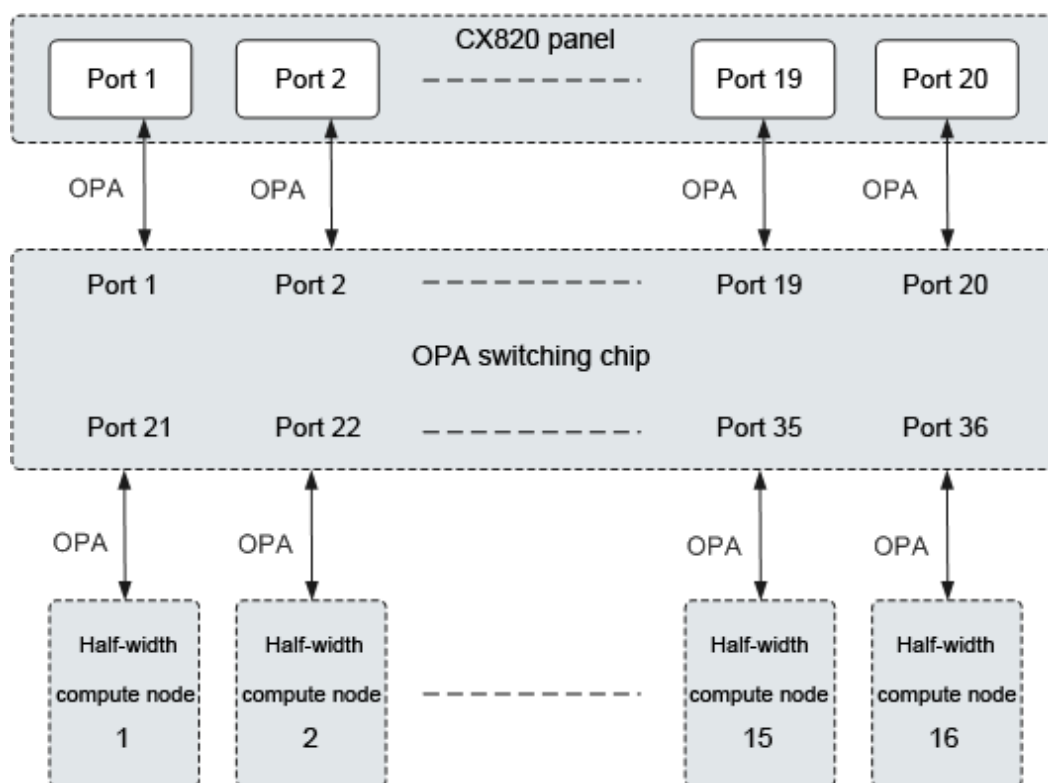
### Switching Chip Port Allocation

The 36 ports on the CX820 are provided by the Switch-OPA chip, numbered 1 to 36, and allocated as follows:

- 20 OPA ports (1 to 20) on the panel are used to connect to external devices.
- 16 internal OPA ports (21 to 36) connect to the mezzanine cards on the 16 half-width or eight full-width nodes.

Figure 1-6 shows the port allocation.

Figure 1-6 Port allocation



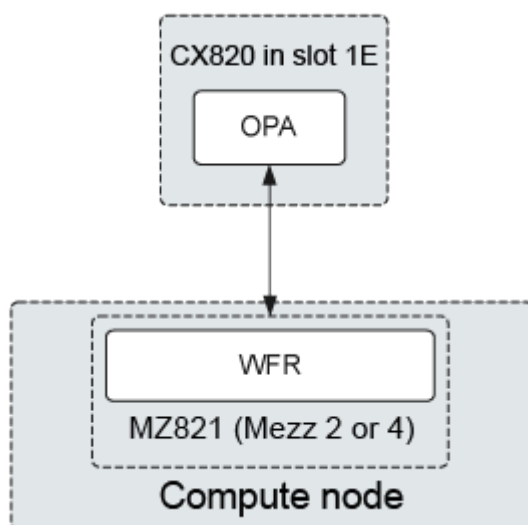
#### NOTE

The mapping between full-width compute nodes and ports is the same as that between half-width compute nodes and ports.

### Mapping Between Switch Modules and Mezzanine Card Ports

The mezzanine card in slot Mezz 2 or Mezz 4 of a compute node connects to an OPA port of the CX820 in slot 1E.

**Figure 1-7** Connection between a CX820 switch module and an MZ821 NIC



## 1.7 Software and Hardware Compatibility

Use the [Huawei Server Compatibility Checker](#) to check the software and hardware supported by the CX820.

### Supported Mezzanine Card

**Table 1-3** Supported mezzanine card

Name	Description
MZ821	Single-port Intel Omni-Path Fabric (OPF) mezzanine card

### Supported Cables and Transceivers

**Table 1-4** Supported cables and transceivers

Name	Description
OPA 100G DAC cable	1 m, 2 m, and 3 m passive DAC cables
OPA 100G AOC cable	3 m, 5 m, 10 m, 15 m, 20 m, and 30 m active AOC cables
Console cable	Serial cable with an RJ45 connector and an RS232 connector



## 1.8 Technical Specifications

**Table 1-5** Technical specifications

Category	Item	Specifications
Physical specifications	Dimensions (H x W x D)	388.55 mm × 35.06 mm × 272.15 mm (15.3 in. x 1.38 in. x 10.71 in.)
	Color	Silver
	Weight	2.78 kg (6.13 lb)
Environmental specifications	Temperature	<ul style="list-style-type: none"> <li>● Operating temperature: 5°C to 40°C (41°F to 104°F) (ASHRAE Class A3 compliant)</li> <li>● Storage temperature: - 40°C to +65°C ( - 40°F to +149°F)</li> <li>● Temperature change rate &lt; 20°C (36°F)/hour</li> </ul>
	Humidity	<ul style="list-style-type: none"> <li>● Operating humidity: 5% RH to 85% RH (non-condensing)</li> <li>● Storage humidity: 5% RH to 95% RH (non-condensing)</li> <li>● Humidity change rate &lt; 20% RH/hour</li> </ul>
	Altitude	<p>40°C (104°F) at 900 m (2952.76 ft)</p> <p>When the device is used at an altitude from 900 m (2952.76 ft) to 5000 m (9842.52 ft), the highest operating temperature decreases by 1°C (1.8°F) for every increase of 300 m (984.25 ft).</p>
	Corrosive gaseous contaminant	<ul style="list-style-type: none"> <li>● Copper corrosion rate test requirements: The corrosion product thickness growth rate is lower than 300 Å/month (meeting level G1 requirements of the ANSI/ISA-71.04-2013 standard on gaseous corrosion).</li> <li>● Corrosion rate of a silver test piece: &lt; 200 Å/month</li> </ul>
	Particle contaminant	<ul style="list-style-type: none"> <li>● The equipment room environment meets the requirements of ISO 14664-1 Class 8. You are advised to hire a professional organization to monitor particle contaminants in the equipment room.</li> <li>● The equipment room is free from explosive, conductive, magnetic conductive, and corrosive dust.</li> </ul>
Input power	Rated input voltage	12 V DC

Category	Item	Specifications
Power consumption	Maximum power consumption	128 W

# 2 Standards and Certifications

## About This Chapter

[2.1 Standards Compliance](#)

[2.2 Certifications](#)

## 2.1 Standards Compliance

### Industry Standards

**Table 2-1** lists the industry standards.

**Table 2-1** Industry standards

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

## Communication Protocols

**Table 2-2** lists the communication protocols.

**Table 2-2** 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

**Table 2-3** lists the certifications passed by the E9000.

**Table 2-3** 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: <ul style="list-style-type: none"> <li>● EN 55022:2010</li> <li>● CISPR 22:2008</li> <li>● EN 55024:2010</li> <li>● CISPR 24:2010</li> <li>● ETSI EN 300 386 V1.6.1:2012</li> <li>● ETSI ES 201 468 V1.3.1:2005</li> </ul>
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