# Huawei MZ621 NIC V100R001

# White Paper

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| **Issue** | **01** |
| **Date** | **2018-11-12** |

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## Huawei Technologies Co., Ltd.

Address: Huawei Industrial Base
Bantian, Longgang
Shenzhen 518129
People's Republic of China

Website: http://e.huawei.com

# About This Document

## Purpose

This document describes the MZ621 in terms of its functions, appearance, features, applications, and technical specifications. You can obtain comprehensive information about the MZ621 by reading this document.

## 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 document are defined as follows.

| Symbol | Description |
| --- | --- |
|   | Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. |
|   | Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. |
|   | Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. |
|   | Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results.<br>NOTICE is used to address practices not related to personal injury. |
|   | Calls attention to important information, best practices and tips.<br>NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration. |

# Change History

| Issue | Date | Description |
| --- | --- | --- |
| 01 | 2018-11-12 | This issue is the first official release. |

# Contents



# 1 Overview

## 1.1 Functions

The MZ621 is a single-port InfiniBand (IB) host channel adapter (HCA). It provides a 100 Gbit/s IB enhanced data rate (EDR) port for E9000 compute nodes to connect to switch modules in the chassis.

The MZ621 uses the Mellanox ConnectX-5 (CX5) chip and supports HCA applications. The 100 Gbit/s port supports 100/56/40 Gbit/s auto-negotiation and supports 100 Gbit/s (EDR), 56 Gbit/s (FDR), and 40 Gbit/s (QDR) port applications. (FDR stands for fourteen data rate; QDR stands for quad data rate.) The MZ621 supports the remote direct memory access (RDMA) feature to meet the requirements of low-latency network applications.

## 1.2 Appearance

The MZ621 can be installed in slot Mezzanine1 (Mezz1 for short) or Mezzanine2 (Mezz2 for short) on a half-width compute node or in slot Mezz1, Mezz2, Mezzanine3 (Mezz3 for short), or Mezzanine4 (Mezz4 for short) on a full-width compute node. The MZ621 provides network ports for connecting to switch modules.

- If the MZ621 is installed in slot Mezz1 or Mezz3, its 100 Gbit/s physical port connects to switch module slot 2X.
- If the MZ621 is installed in slot Mezz2 or Mezz4, its 100 Gbit/s physical port connects to switch module slot 1E.

**Figure 1-1** Appearance of the MZ621

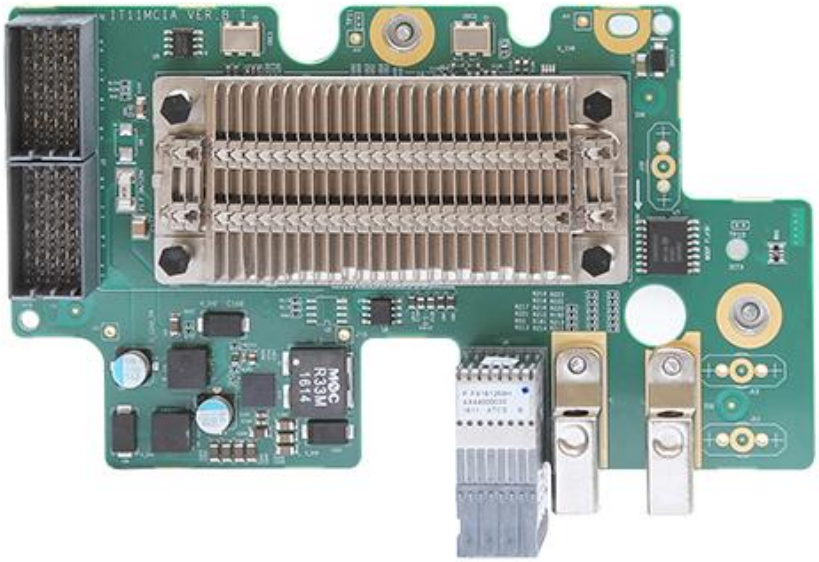


**Figure 1-2** MZ621 installation positions on a half-width compute node

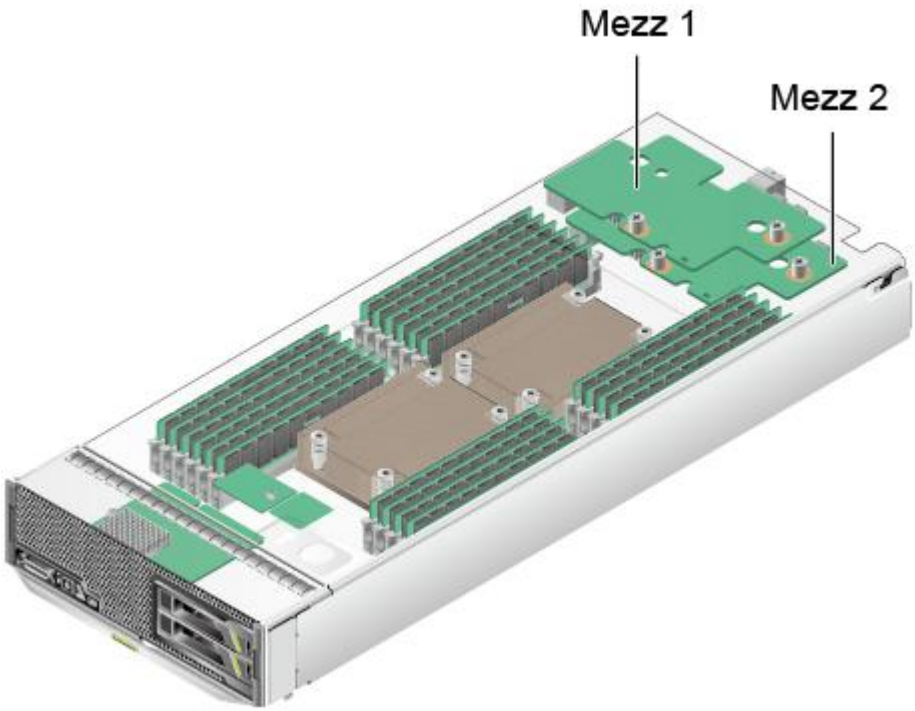
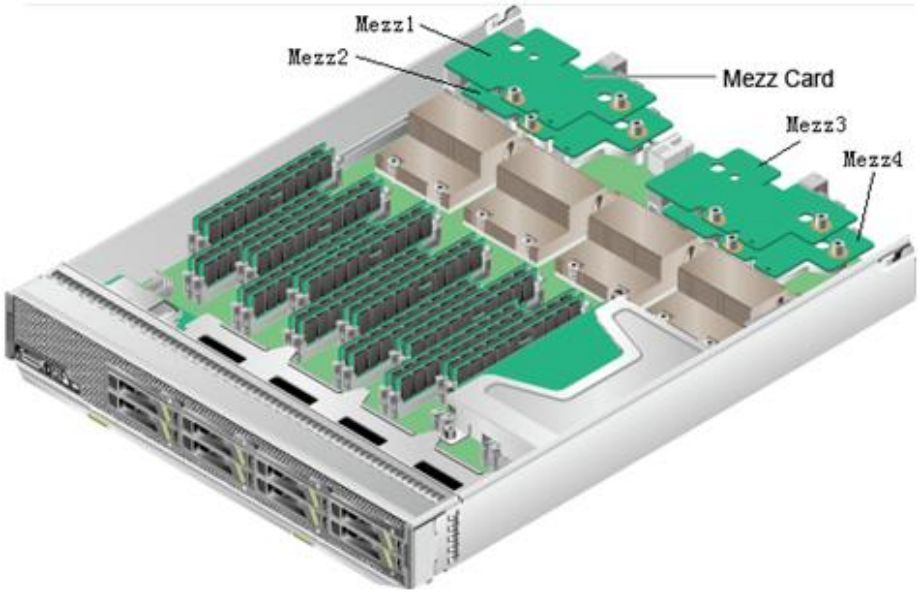


**Figure 1-3** MZ621 installation positions on a full-width compute node



# 2 Features

## 2.1 Feature List

The MZ621 supports the following features and performance specifications:

- InfiniBand Trade Association (IBTA) 1.3 specifications
- RDMA
- 16 million I/O channels
- End-to-end QoS and nine virtual lanes (VLs), including eight data VLs and one control VL
- Hardware-based congestion control
- In-band management and support for third-party Subnet Managers (SMs)
- PCIe 3.0 x16 system interface

**NOTE**
If flow control is configured on the NIC, it must also be configured on the corresponding switch module or external switch.

## 2.2 Feature Description

### RDMA

The MZ621 supports the RDMA feature. This feature uses the kernel bypass technology to reduce the packet processing and forwarding latency of the HCA, to reduce the CPU usage, and to implement low-latency data transmission over the data center network. With the RDMA feature, the end-to-end read and write delay of the HCA can reach 1 us when the packet length is 128 bytes. The MZ621 supports 16 million I/O channels (equivalent to IB QPs), and provides priority-based scheduling and flow control to support low-latency, high-bandwidth network transmission. The MZ621 supports OpenFabrics Enterprise Distribution for Linux (Linux OFED).

### QoS

The MZ621 supports end-to-end QoS for IB. It supports the VL mechanism defined in IB specifications, VL arbitration, and control-domain and service-domain prioritizing. The end-to-end QoS priority is represented by the service level (SL) domain of IB packets. Each SL is mapped to a VL. SMs configure VL arbitration and the SL-to-VL mapping table using

network management datagrams (MADs). The MZ621 supports nine VLs, including eight data VLs and one control VL.

# 3 Applications

## 3.1 Software and Hardware Compatibility

For details about the software and hardware that are compatible with the MZ621, see *Huawei Server Compatibility Checker*.

## 3.2 Networking

The MZ621 can connect to I/O modules (switch modules) to provide IB services.

### Connection Between the MZ621 and the CX611

The MZ621 can work with the CX611 switch module to provide 56 Gbit/s interface bandwidth, and connect to the external IB network through 56 Gbit/s FDR ports on the CX611.

**Figure 3-1** Connection between the MZ621 and the CX611


### Connection Between the MZ621 and the CX620

The MZ621 can work with the CX620 switch module to provide 100 Gbit/s interface bandwidth, and connect to the external IB network through 100 Gbit/s EDR ports on the CX620.

**Figure 3-2** Connection between the MZ621 and the CX620

# 4 Technical Specifications

## 4.1 Technical Specifications

**Table 4-1** Technical specifications

| Item | Specifications |
|---|---|
| Dimensions (length x width) | 148 mm x 85 mm (5.83 in. x 3.35 in.) |
| Power supply | 12 V DC |
| Net weight | 0.15 kg |
| Maximum power consumption | 18 W |
| Temperature | Operating temperature: 5 ℃ to 40 ℃ (41 ℉ to 104 ℉) (ASHRAE Class A3 compliant) |
| | Storage temperature: –40 ℃ to +65 ℃ (–40 ℉ to +149 ℉) |
| Temperature change rate | 15 ℃/h (27 ℉/h) |
| Humidity | Operating humidity: 5% RH to 85% RH (non-condensing) |
| | Storage humidity: 5% RH to 95% RH (non-condensing) |
| Altitude | 40 ℃ (104 ℉) at 900 m (2952 ft.)<br>When the device is used at an altitude of 900 m to 5000 m (2952 ft. to 16404 ft.), the highest operating temperature decreases by 1 ℃ (1.8 ℉) for every increase of 300 m (984 ft.). |
| Corrosive air pollutant | • Corrosion rate of the copper test piece: < 300 Å/month (in compliance with the ANSI/ISA-71.04-2013 gaseous corrosion level G1)<br>• Corrosion rate of the silver test piece: < 200 Å/month |
| Particulate pollutant | • The ISO14664-1 Class 8 requirements are met. You are advised to ask a professional organization to monitor particulate pollutants in the equipment room.<br>• There is no explosive, conductive, magnetic, or corrosive |

| Item | Specifications |
| --- | --- |
| | dust in the equipment room. |
| Number of ports | 1 |
| Port type | IB |
| Chip model/manufacturer | ConnectX-5 (CX5)/Mellanox |

# 4.2 Standards and Specifications

**Table 4-2** Standards and protocols that the MZ621 complies with

| Standard | Protocol |
| --- | --- |
| IBTA 1.3 | InfiniBand Trade Association |
| ANSI INCITS 365-2002 | SCSI RDMA Protocol (SRP) |
| IETF | iSCSI Extensions for RDMA (iSER) |
| DAPL | User Direct Access Programming Library (uDAPL) |

# A Acronyms and Abbreviations

| | |
|---|---|
| **E** | |
| EDR | Enhanced Data Rate |
| | |
| **H** | |
| HCA | host channel adapter |
| | |
| **I** | |
| IB | InfiniBand |
| IBTA | InfiniBand Trade Association |
| IO | input/output |
| | |
| **M** | |
| MAD | Management Datagram |
| | |
| **O** | |
| OFED | OpenFabrics Enterprise Distribution |
| OS | operating system |
| | |
| **P** | |
| PCIe | Peripheral Component Interconnect Express |
| | |
| **Q** | |
| QoS | quality of service |

| | |
|---|---|
| QP | queue pair |
| | |
| **R** | |
| RDMA | Remote Direct Memory Access |
| | |
| **S** | |
| SL | service level |
| SM | Subnet Manager |
| | |
| **V** | |
| VL | virtual lane |