QNAP

QXG-25G2SF-CX6

25Gbe network expansion card supports SR-IOV and RoCE to boost network and virtualization efficiency
01. QNAP high-speed NIC products, lead to next generation of faster ethernet

02. Specification & Features

03. QTS / QuTS hero support FEC configuration

04. Build up 25GbE environment
QNAP high-speed NIC products, lead to next generation of faster ethernet.
Fast growing market and performance of SSD

More and more NVMe SSDs are launched. Speed of Internet should be also increased as the bandwidth of SSD doubles!

SAMSUNG PM9A3 U.2 SSD
Read 6,800MB/s, Write 4,000MB/s

SAMSUNG 980 PRO
Read 6,200MB/s, Write 4,900MB/s

QNAP All-Flash Array
TS-h2490FU / TS-h3088XU-RP

All-flash array provides hundreds of thousands of IOPS, but do you get your I/O devices up to speed?
SSD generation comes! PCIe 4.0 doubles the bandwidth

2020 Global Shipments of SSDs Surpassed HDDs for First Time!

Solid-state drive shipments surpassed those of traditional hard drives by a significant margin in 2020 but spinning media retained the crown in terms of overall capacity served. As pricing continues to plummet and capacity increases, we can expect to see the ratio become even more skewed. According to data storage research and consulting firm TrendFocus (per Storage Newsletter), manufacturers shipped 333.12 million solid-state drives in 2020 – an increase of 20.8 percent year-over-year. Hard drive shipments, meanwhile, were down 18 percent annually to 259.81 million units.

Source: techspot
Bottleneck for 10GbE high-speed transmission among multiple users

PC/workstation

10GbE Transmission

Enterprise U.2 NVMe SSD or PCIe Gen4 SSD

10GbE Card

Hundreds of thousands of IOPS

10GbE Transmission

Bottleneck

QNAP All-Flash Array  TS-h2490FU / TS-h3088XU-RP
Strength of 25GbE – easily upgrade to 50/100GbE

Lower bandwidth than 40GbE, but more easily upgrade to 50/100GbE

Source: Mellanox
Specification & Features
Brand new QNAP 25GbE NIC – QXG-25G2SF-CX6

**QXG-25G2SF-CX6**
Dual-port 25GbE SFP28 NIC

- 2 x SFP28 connectors
- Support 2-speed 25GbE / 10GbE

**Mellanox ConnectX®-6 Lx Controller**

- Support iSER / RoCE offloads
QXG-25G2SF-CX6 25GbE hardware specification

- PCIe Gen 4 x8 interface up to 128Gbit/s bandwidth
- Dual-port 25GbE (SFP28) ports
- Active heatsink for controller chip
- Low-profile bracket pre-installed; full-height and specialized (for selected QNAP NAS) brackets are bundled
- Optional accessory: 25GbE SFP28 DAC
Support multiple OS to deploy your 25GbE environment

- Windows Server
  - Download Windows Driver
- Red Hat
  - Download Linux Driver
- Ubuntu
  - Ubuntu 18.04 and later
- QTS
  - QTS 4.5.2 and later
- QuTS hero
  - QuTS hero 4.5.2 and later
### QXG-25F2SF-CX6 v.s QXG-25G2SF-CX4

<table>
<thead>
<tr>
<th>Feature</th>
<th>QXG-25G2SF-CX4</th>
<th>QXG-25G2SF-CX6</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCIe express</td>
<td>Gen3 x8</td>
<td>Gen4 x8</td>
</tr>
<tr>
<td>Message Rate</td>
<td>70Mpps</td>
<td>75Mpps</td>
</tr>
<tr>
<td>PTP (1588)</td>
<td>N/A</td>
<td>Supported</td>
</tr>
<tr>
<td>Secure boot</td>
<td>N/A</td>
<td>Supported</td>
</tr>
<tr>
<td>VirtIO acceleration</td>
<td>N/A</td>
<td>Yes</td>
</tr>
<tr>
<td>RoCE v1/v2</td>
<td>Supported</td>
<td>Supported</td>
</tr>
<tr>
<td>RDMA</td>
<td>Supported</td>
<td>Supported</td>
</tr>
<tr>
<td>SR-IOV</td>
<td>Supported</td>
<td>Supported</td>
</tr>
</tbody>
</table>

#### Performance

![Performance Chart]

- **Performance**
  - **Read (Gb/s)**
  - **Write (Gb/s)**
Connector's form-fact from 1GbE to 100GbE

- 1 GbE: SFP
- 10 GbE: SFP+
- 25 GbE: SFP28
- 40 GbE: QSFP+
- 100 GbE: QSFP28
Experience the fastest performance with PCIe 4.0 NAS

TS-h2490FU-7302P-128G

- AMD EPYC 16core/32thread, 3.0 GHz (Max. 3.3GHz)
- 128GB DDR4 RDIMM ECC memory (8 x 16GB)
- 4 x SFP28 25GbE ethernet ports (25GbE/10GbE/1GbE)

TS-h2490FU-7232P-64G

- AMD EPYC 8core/16thread, 3.1 GHz (Max. 3.2GHz)
- 64GB DDR4 RDIMM ECC memory (8 x 8GB)
- 2 x SFP28 25GbE ethernet ports (25GbE/10GbE/1GbE)

*Slot 4 and Slot 5 are preinstalled with 25GbE network adapters. Please reserve these slots for the 25GbE adapters for the best performance.
**Slot 2 provides the width of PCIe Gen4 x8 when Slot 3 is not in use, and provides the width of PCIe Gen4 x4 when Slot 3 is in use.
***Slot 5 provides the width of PCIe Gen4 x16 when Slot 4 is not in use, and provides the width of PCIe Gen4 x8 when Slot 4 is in use.
Upgrade your QNAP High-end NAS with PCIe 3.0 for faster ethernet experience

**TS-h3088XU-RP**
- Intel Xeon W 1250 / 1270
- 2 x SFP28 25GbE ethernet ports (25GbE/10GbE/1GbE)
  - Slot 1: PCIe Gen3 x8 or x4
  - Slot 2: PCIe Gen3 x4
  - Slot 3: PCIe Gen3 x4

**TS-hx83XU**
- Intel Xeon E series
- 2 x SFP+ 10GbE ethernet ports (10GbE/1GbE)
  - 1U: Gen3 x16 (CPU)
  - 2U & 3U: Slot 2 with Gen3 x8 (CPU)
  - 4U: slot 4 with Gen3 x8 (CPU)

**TVS-h1288X**
- Intel Xeon W 1250 / 1270
- 2 x RJ45 10GbE ethernet ports (10GbE/5GbE/2.5GbE/1GbE/100M)
  - Slot 1: PCIe Gen3 x8
  - Slot 2: PCIe Gen3 x4
  - Slot 3: PCIe Gen3 x4

*Find out full compatibility list on our website!
Offload tasks from CPU with iSER

• iSER allows data to bypass general network drivers, the socket layer, and to directly enter memory buffers of the server and storage.

• Increasing performance, lower CPU loading

* iSER will support in QTS / QuTS hero later
QTS / QuTS hero support FEC configuration
Ensure data correction during transmission with FEC

• FEC (Forwarded-error-Correction) controlling errors in data transmission over unreliable or noisy communication channels.
• FEC must configured the same mode for both switch and NIC side.

Enable FEC (To turn on/off FEC)

Auto-negotiation
(Follow the sequence to negotiation from RS-FEC -> Base-R FEC -> Disable FEC -> 10GbE)

BASE-R FEC (Enable BASE-R FEC)
aka Firecode or Clause 74. Offers simple, low-latency (<100ns) protection against bursty errors.

RS-FEC (Enable RS-FEC)
aka Reed Solomon or Clause 91. Offers better error protection but adds latency (~250ns)

Configure FEC option require QTS 4.5.3 / QuTS hero 4.5.2 and later
*Older QTS/QuTS hero, FEC are set as Auto-negotiation.
*Switch and NIC require the same FEC configure in order to work properly.
Support FEC configuration for all models above 25GbE

For QTS 4.5.3 / QuTS hero 4.5.2 and later, you could configure FEC mode depends on your network environment in NIC setting page
Configure FEC mode with ethtool in Windows / Linux

Show current FEC mode

ethtool --show-fec devname

configure FEC mode

Auto: ethtool --set-fec devname encoding auto
Off: ethtool --set-fec devname encoding off
RS-FEC: ethtool --set-fec devname encoding rs
BASE-R FEC: ethtool --set-fec devname encoding baser

* Driver for Windows / Linux are required.
  • Linux: https://www.mellanox.com/products/infiniband-drivers/linux/mlnx_ofed
Build up 25GbE environment
QNAP makes your network environment faster!

Mellanox SN2010
25/100 GbE switch

18x 10/25GbE SFP+/28 ports

25 GbE

25 GbE

25 GbE

100 GbE

QNAP 100GbE NIC
QXG-100G2SF-E810

QNAP High-end NAS
Or Server

VM

Media Workstation
Connect to 100GbE/50GbE environment with break-out cable

- 4 x SFP28 connector
- 4 x 100GbE ports
- QSFP28 break-out cable
- Support 25GbE Transceiver
- TRX-25GSFP-SR
- 25GbE SR Transceiver
- TRX-10GSFP-SR-MLX
- 10GbE SR Transceiver
Accessories for 10GbE / 25GbE / 100GbE

**QXG-25G2SF-CX6**
- **25GbE SFP28 DAC**
- CAB-DAC30M-SFP28
- CAB-DAC15M-SFP28

**QXG-100G2SF-E810**
- **100GbE QSFP28 DAC**
- CAB-DAC15M-QSFP28
- CAB-DAC15M-QSFP28-B4

**25GbE SR Transceiver**
- TRX-10GSFP-SR-MLX

**10GbE SR Transceiver**
- TRX-25GSFP-SR
Upgrade to 25GbE / 100GbE now!
QXG-25G2SF-CX6
Your best choice!