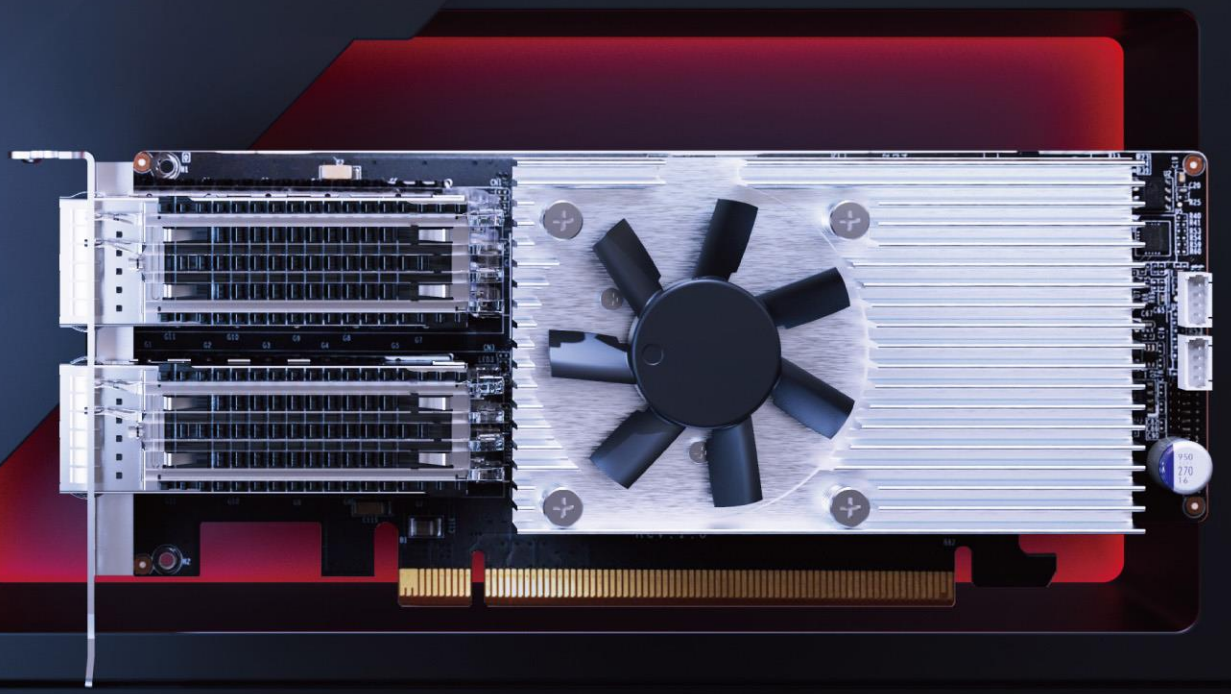
QNAP

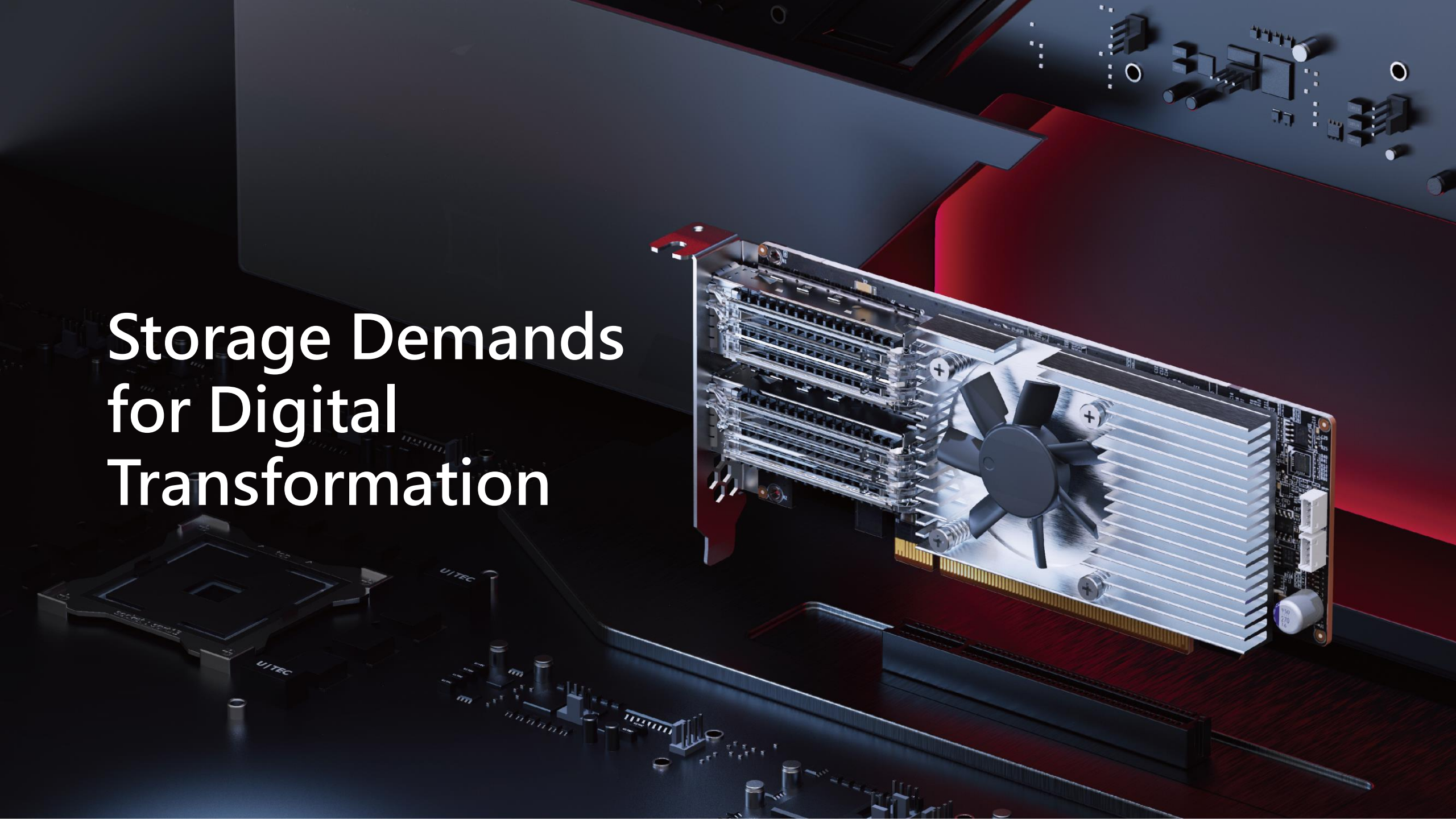
QXG-100G2SF-E810

The dual-port **100GbE** network expansion card
with QSFP28 connector to boost all-flash performance

100GbE QSFP28 x2 | intel | 4.0 PCIe | Smart NIC | SR-IOV

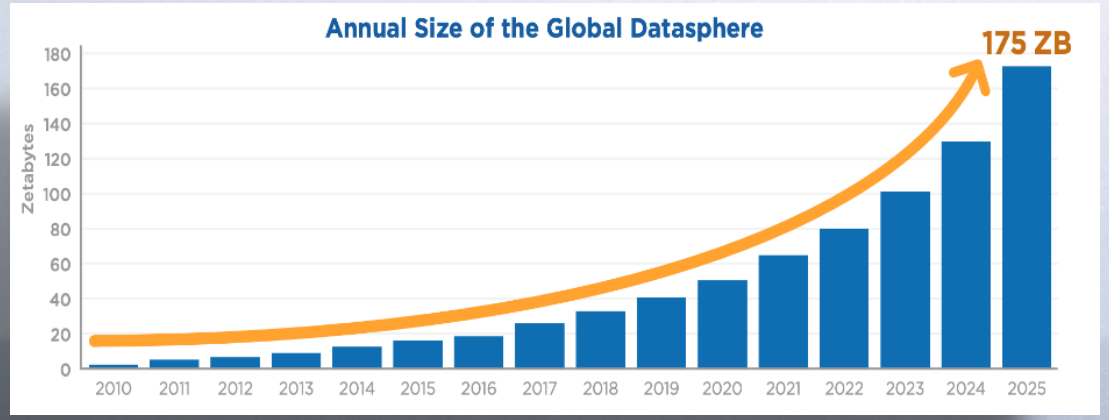


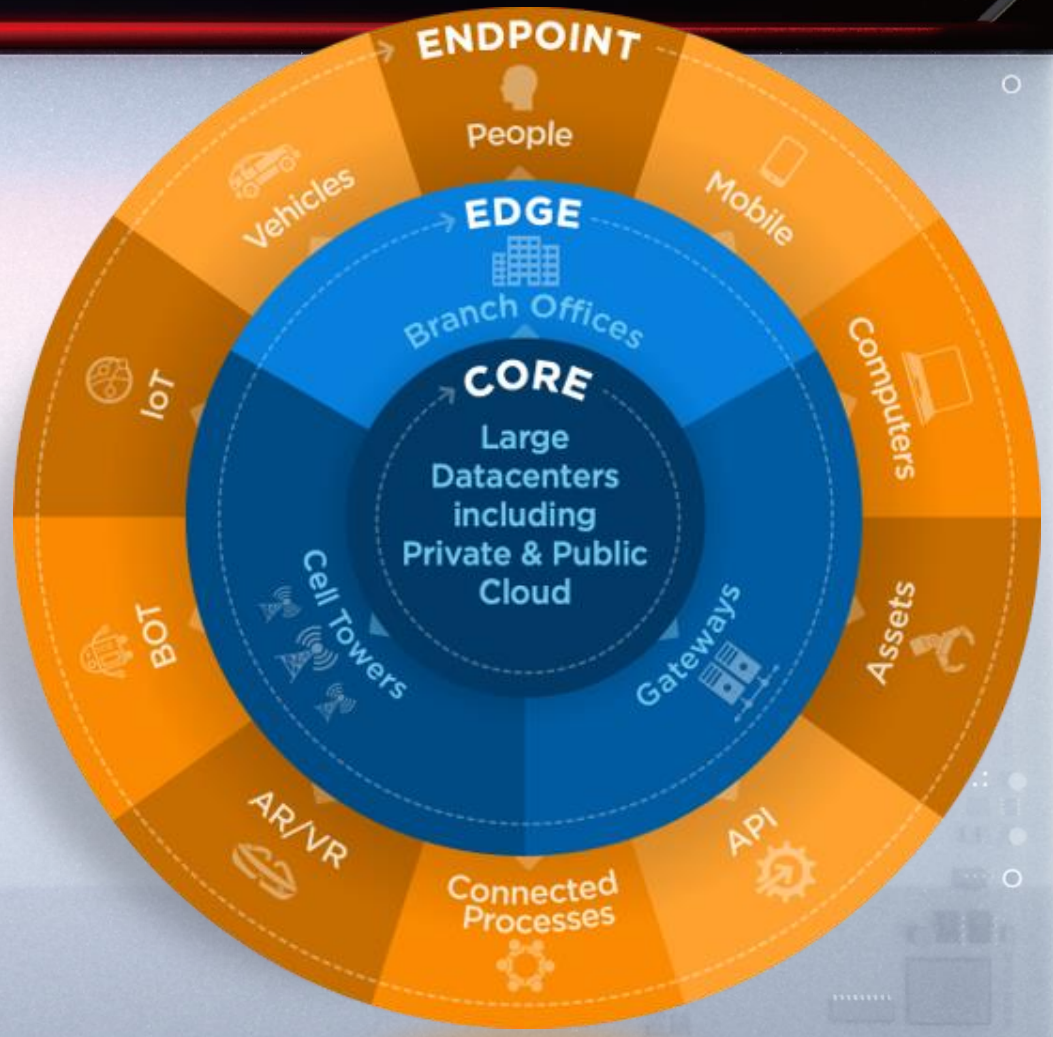
Storage Demands for Digital Transformation



Big data wave causing rapid adoption of digital transformation in businesses

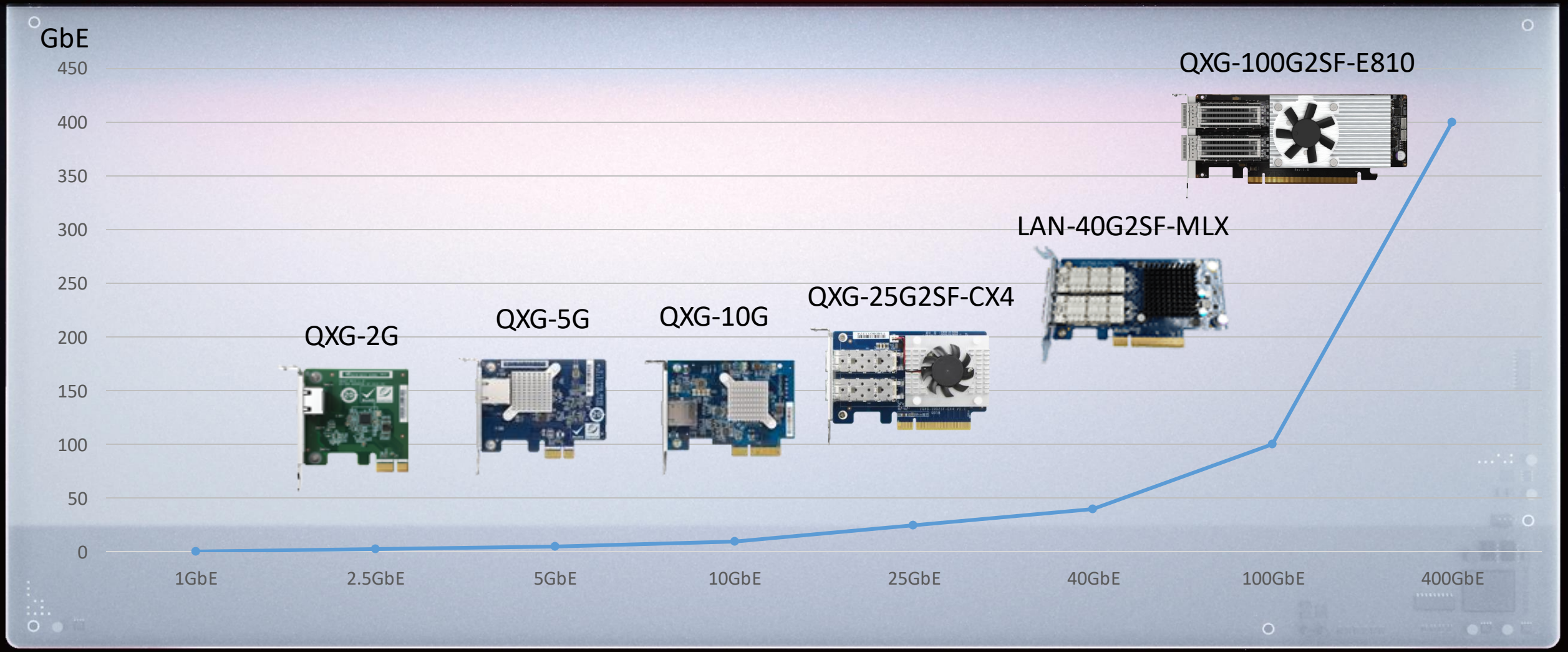
Digital transformation is based upon the large amount of raw data, which is needed to be instantly analyzed for making a meaningful business decision. Therefore, it is critical to store the data in a high-performing, low-latency all flash array (AFA).





Source： Data Age 2025, sponsored by Seagate with data from IDC Global DataSphere, Nov 2018

Rapid development of high-speed network technologies



QNAP All-Flash Array (AFA) Series

- **With the ZFS file system, featuring data security and data reduction technologies**
  - Increase storage efficiency and maximize ROI
  - Deduplication, inline compression, and data compaction

TS-h3088XU

2U 30-bay 2.5-inch SATA SSD
ZFS file system

TS-h3088XU-RP-W1270-64G
TS-h3088XU-RP-W1250-32G

TS-h2490FU

2U 24-bay 2.5-inch U.2 NVMe SSD
ZFS file system

TS-h2490FU-7302P-128G
TS-h2490FU-7232P-64G

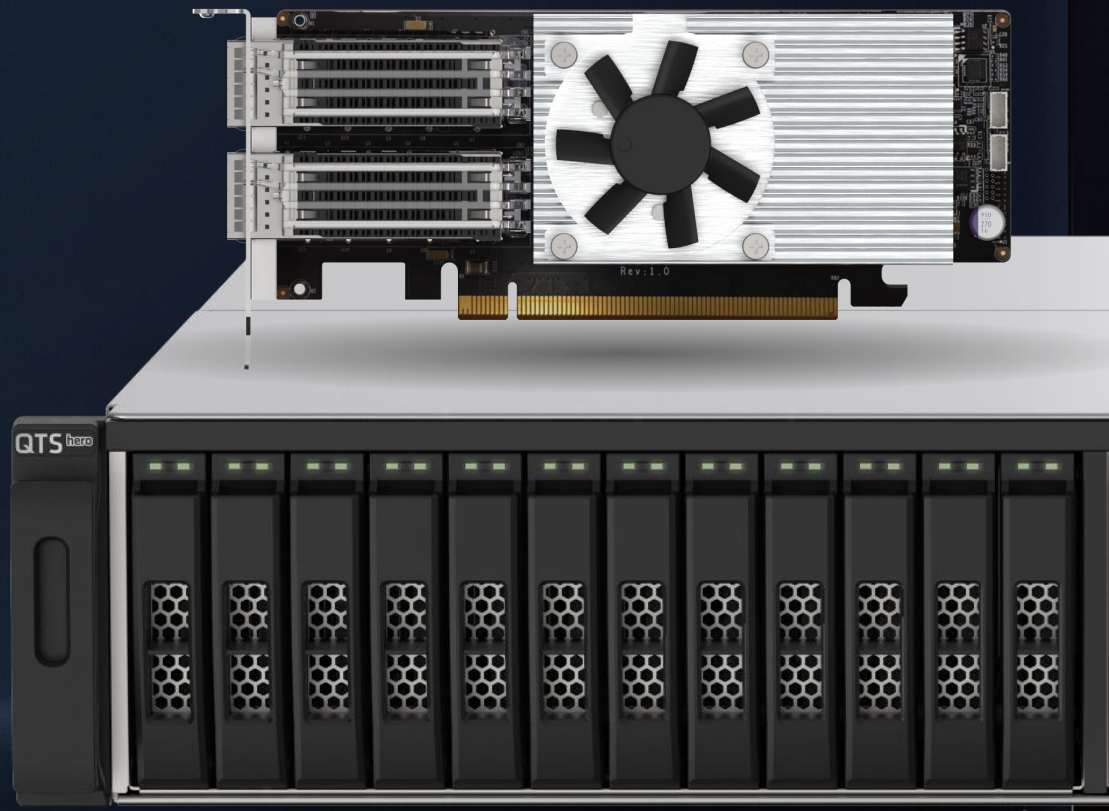
TS-h2490FU NAS SKUs

TS-h2490FU-7302P-128G

- AMD EPYC 7302P 16-core/32-thread, 3.0 GHz (Max. 3.3GHz)
- 128GB DDR4 RDIMM ECC memory (8 x 16GB)
- 4 x SFP28 25GbE ports (25GbE/10GbE/1GbE)

TS-h2490FU-7232P-64G

- AMD EPYC 7232P 8-core/16-thread, 3.1 GHz (Max. 3.2GHz)
- 64GB DDR4 RDIMM ECC memory (8 x 8GB)
- 2 x SFP28 25GbE ports (25GbE/10GbE/1GbE)



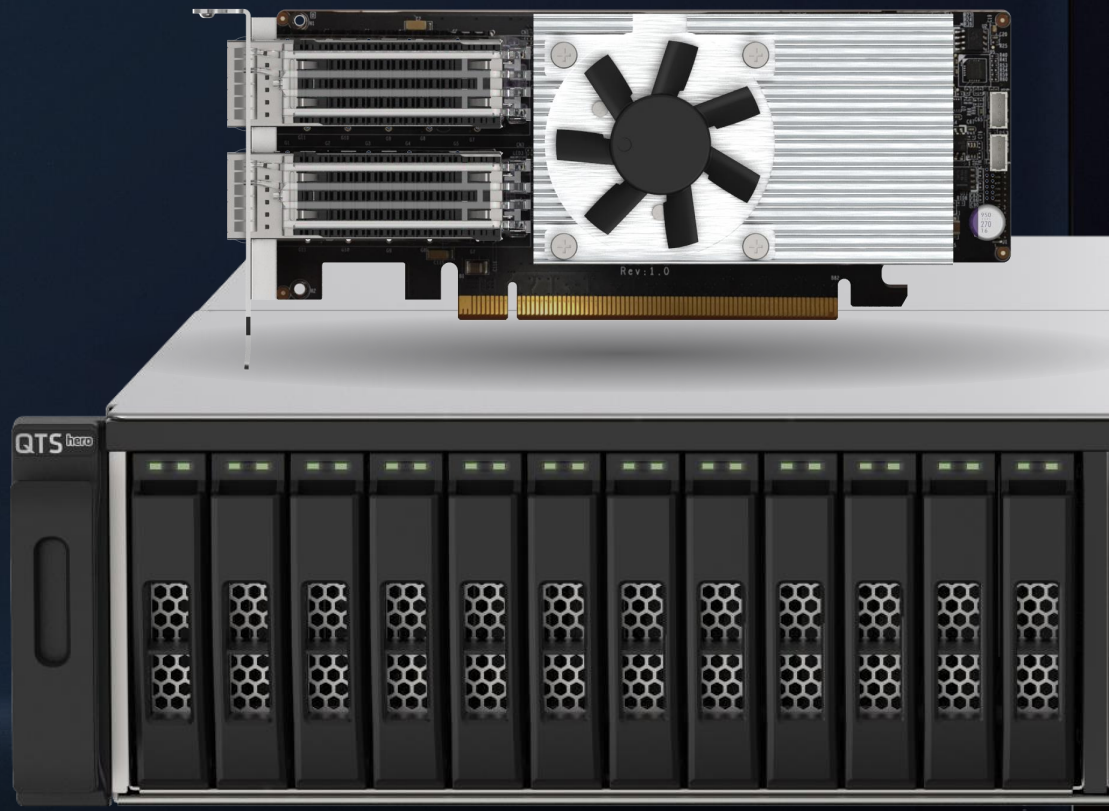
TS-h3088XU NAS SKUs

TS-h3088XU-RP-W1270-64G

- Intel Xeon W-1270 8-core/16-thread, 3.4 GHz (Max. 5.0GHz)
- 64GB DDR4 UDIMM ECC memory (4 x 16GB)
- 2 x SFP28 25GbE ports (25GbE/10GbE/1GbE)

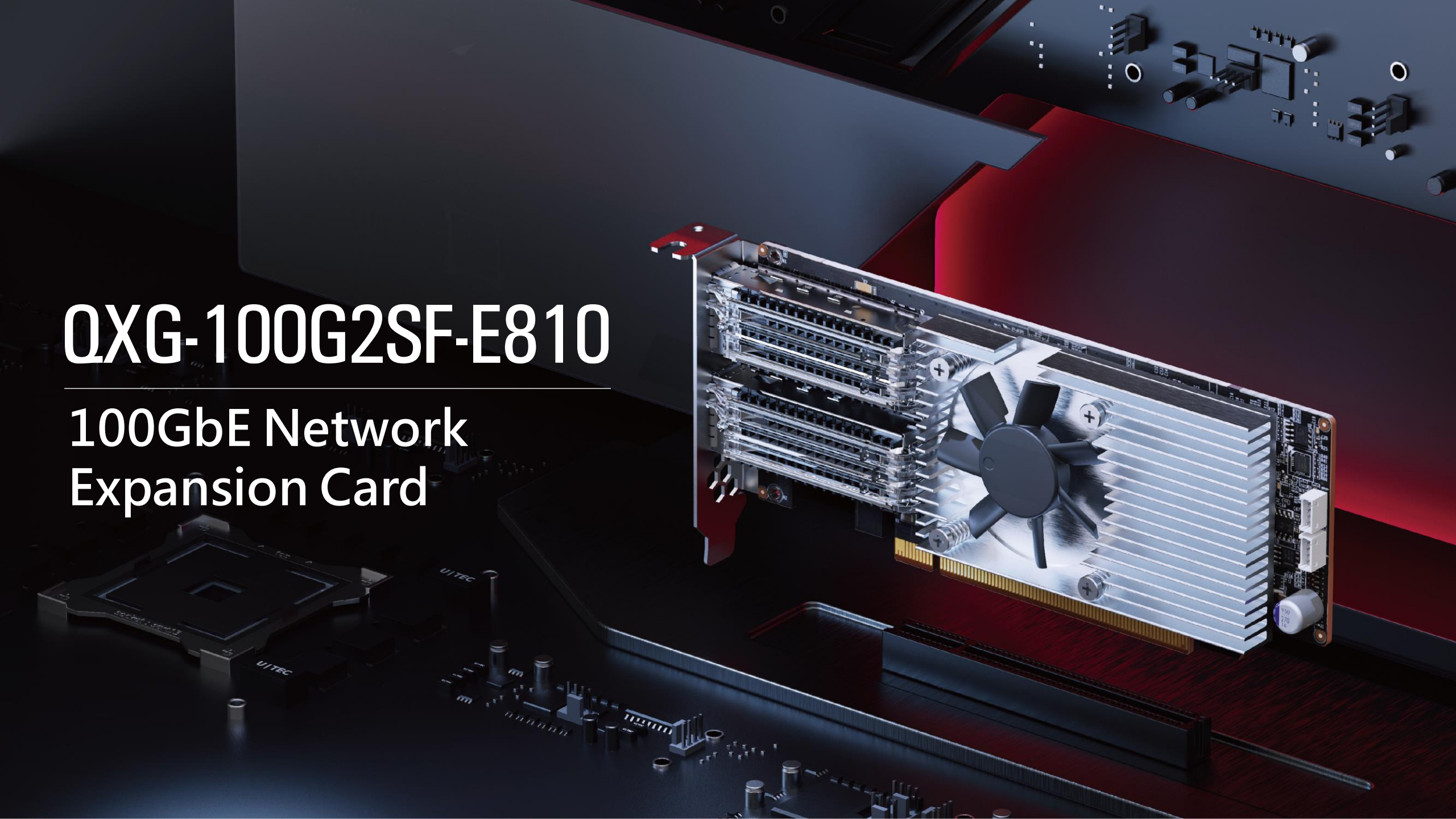
TS-h3088XU-W1250-32G

- Intel Xeon W-1250 6-core/12-thread, 3.3 GHz (Max. 4.7GHz)
- 32GB DDR4 UDIMM ECC memory (2 x 16GB)
- 2 x SFP28 25GbE ports (25GbE/10GbE/1GbE)



QXG-100G2SF-E810

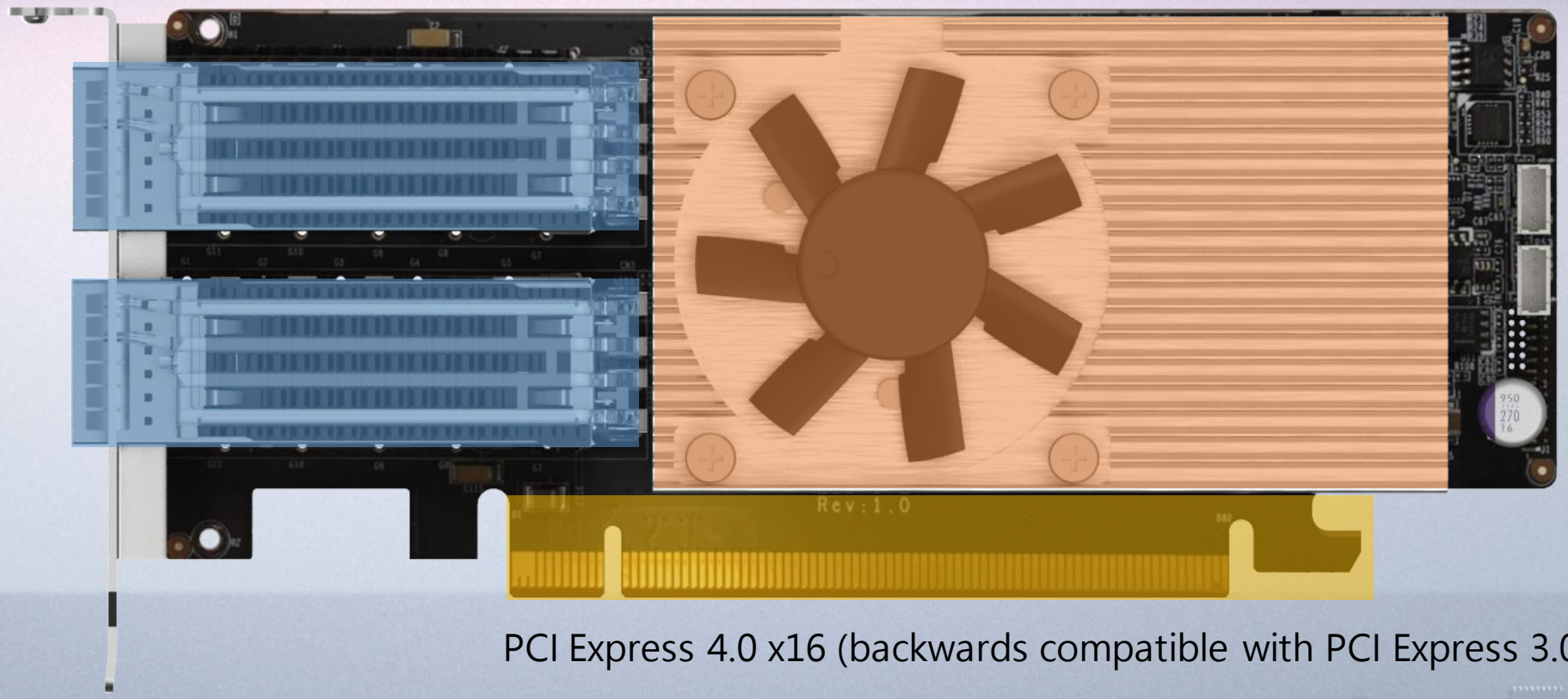
100GbE Network Expansion Card



QXG-100G2SF-E810 view

A high-performance, active cooling module

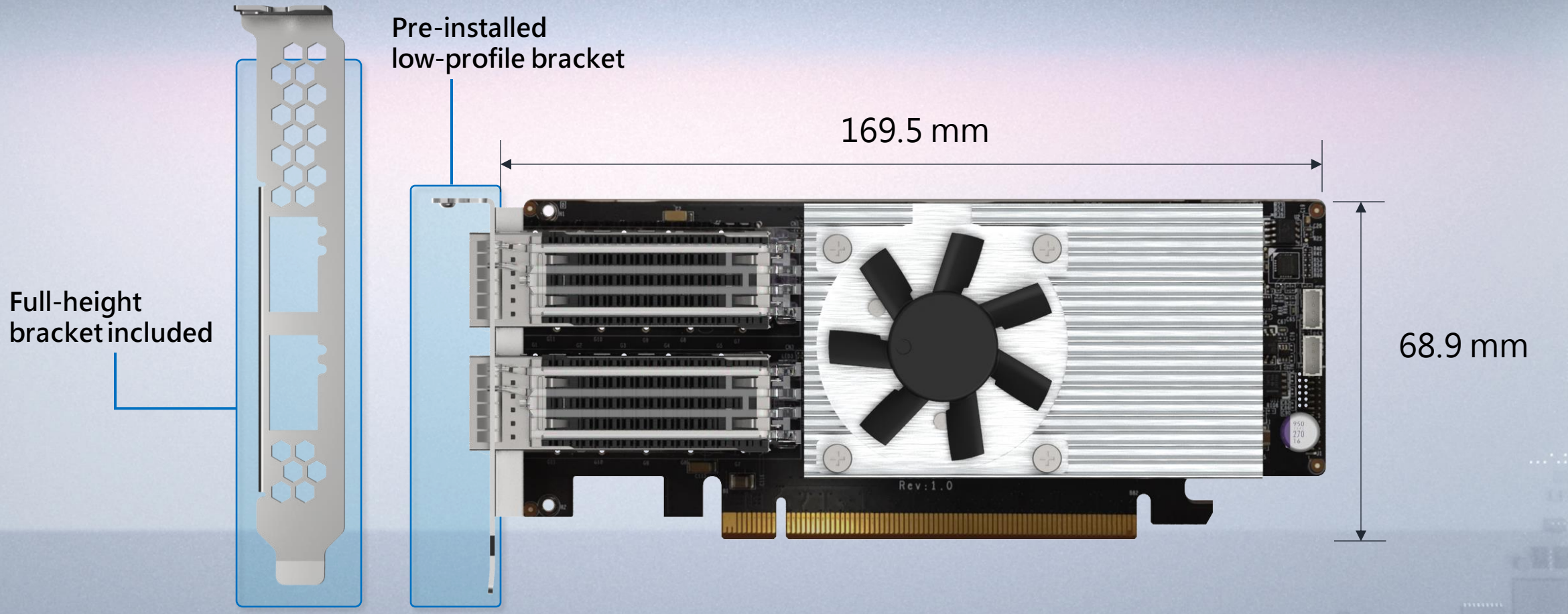
2 x QSFP28 connectors with heatsink



PCI Express 4.0 x16 (backwards compatible with PCI Express 3.0)

SFP, SFP+, SFP28, QSFP28

QXG-100G2SF-E810 low-profile design for general chassis including full-height/low-profile brackets



QXG-100G2SF-E810 Specification

QXG-100G2SF-E810	
Ethernet controller	Intel E800 Series Ethernet controller; E810-CAM2
PCI-Express interface	PCI-Express 4.0 x16 (support PCI Express 3.0)
Connector	QSFP28
Transmission speed	100GbE, 50GbE, 25GbE, 10GbE
Supported operating systems	QuTS hero 4.5.2 and later QTS 4.5.2 and later Linux Windows 10 Windows Server 2016/2019
Dimension	169.5 x 68.9 mm
Support cable & transceiver	CAB-DAC15M-QSFP28 (*coming soon later) CAB-DAC15M-QSFP28-B4 (*coming soon later)

New dual-port 100GbE network expansion card
Supports multiple operating systems

QXG-100G2SF-E810

Software Features

QXG-100G2SF-E810 Supports QoS, SR-IOV, iWRAP, RDMA, RoCE, etc.

Intel® Virtualization Technology for Connectivity

On-chip QoS and Traffic Management	Yes
Flexible Port Partitioning	Yes
Virtual Machine Device Queues (VMDq)	Yes
PCI-SIG* SR-IOV Capable	Yes

Advanced Technologies

Fiber Channel over Ethernet	No
MACsec IEEE 802.1 AE	No
IEEE 1588	Yes
Supported Under Intel vPro® Technology	No
iWARP/RDMA	Yes
RoCEv2/RDMA	Yes
Intel® Data Direct I/O Technology	Yes
Intelligent Offloads	Yes
Storage Over Ethernet	SMB Direct

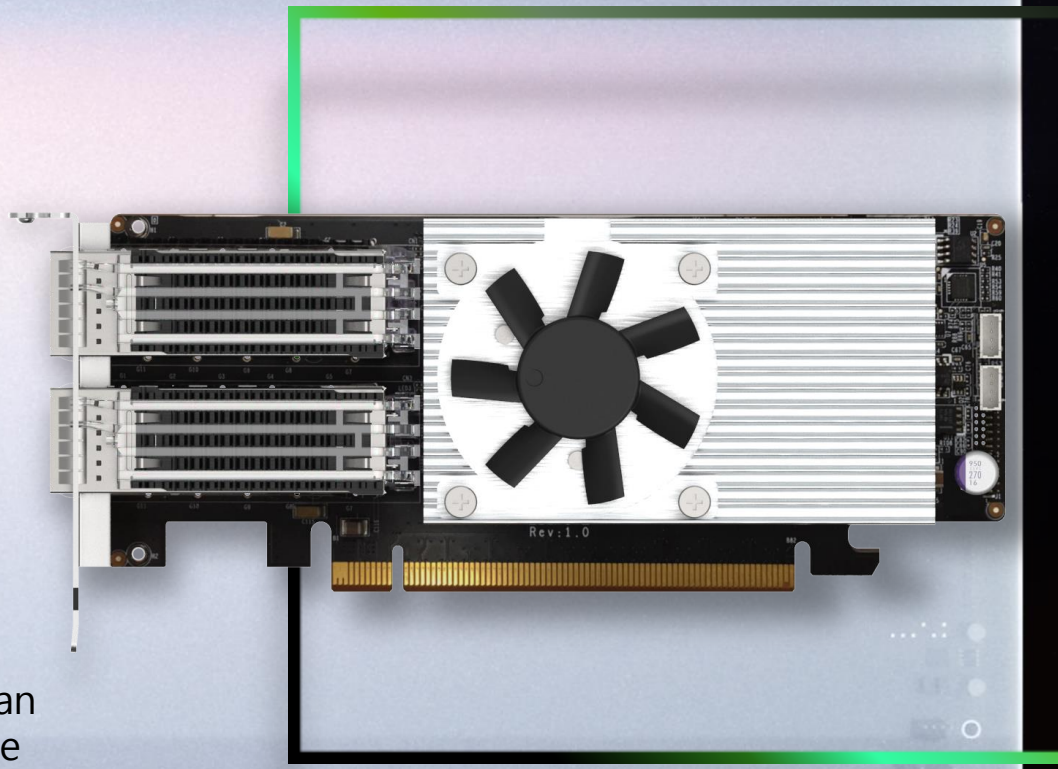
https://ark.intel.com/content/www/us/en/ark/products/187410/intel-ethernet-controller-e810-cam2.html

iWARP / RDMA, SR-IOV, and Link Aggregation Support for QXG-100G2SF-E810 in QTS coming soon

Support iWARP / RDMA, realize RDMA through IP network, can achieve low-latency, high-throughput direct memory-to-memory network communication, thereby eliminating unnecessary data movement.

SR-IOV network I/O virtualization, which directly allocates the bandwidth resources of the physical network card to the virtual machine, can reduce network bandwidth loss and increase network efficiency by more than 20%, and is more stable, which also helps reduce hypervisor CPU is consumption.
Note: Only certain NAS models support SR-IOV technology

When used with a high-speed 25/50/100 network switch, it can be configured with Failover fault-tolerant switching. When the network fails, two groups of 100GbE paths can reach a redundant/backup network through the switch to ensure uninterrupted service.



Split ports

QXG-100G2SF-E810 supports port splitting for the following port modes:

A. 2 x 100GbE (Use a QSFP28-QSFP28 cable: CAB-DAC15M-QSFP28)

B. 2 x 50GbE (Use a QSFP28-QSFP28 cable: CAB-DAC15M-QSFP28)

C. 4 x 25GbE (Use a QSFP28 - **4** x SFP28 cable: CAB-DAC15M-QSFP28-B4)

D. 8 x 10GbE (Use a QSFP28 - **4** x SFP28 cable CAB-DAC15M-QSFP28-B4)

```
epctw64e -nic1 -get
----
>epct -nic=1 -get
Available Port Options:
=================================================================================
Active  Port                          Quad 0                  Quad 1
Option  Option (Gbps)                 L0  L1  L2  L3          L4  L5  L6  L7
======= ============================  ==================      ==================
        4x25                    -> 25  25  25  25          -   -   -   -
        2x1x100                 -> 100 -   -   -           100 -   -   -
   X    2x2x25                  -> 25  25  -   -           25  25  -   -
        2x50                    -> 50  -   50  -           -   -   -   -
        8x10                    -> 10  10  10  10          10  10  10  10
        100                     -> 100 -   -   -           -   -   -   -
```

Windows Server

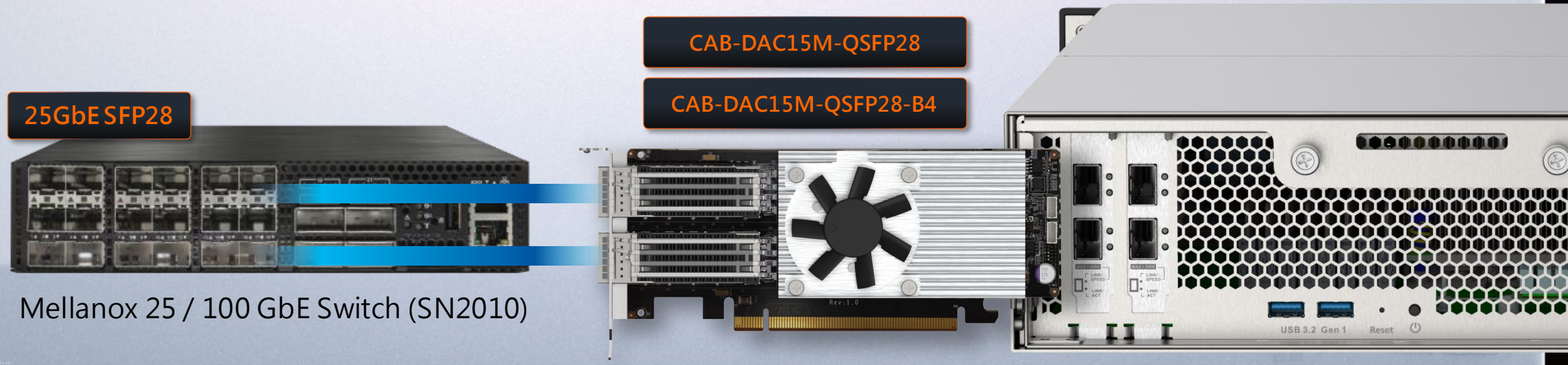
How to use in Windows / Linux

Download Intel EPCT (Ethernet Port Config Tool)

*Support in later QTS / QuTS hero versions
*The left image takes Windows for example. Please refer to Intel Readme document for Linux commands.
*Restart after completing configurations

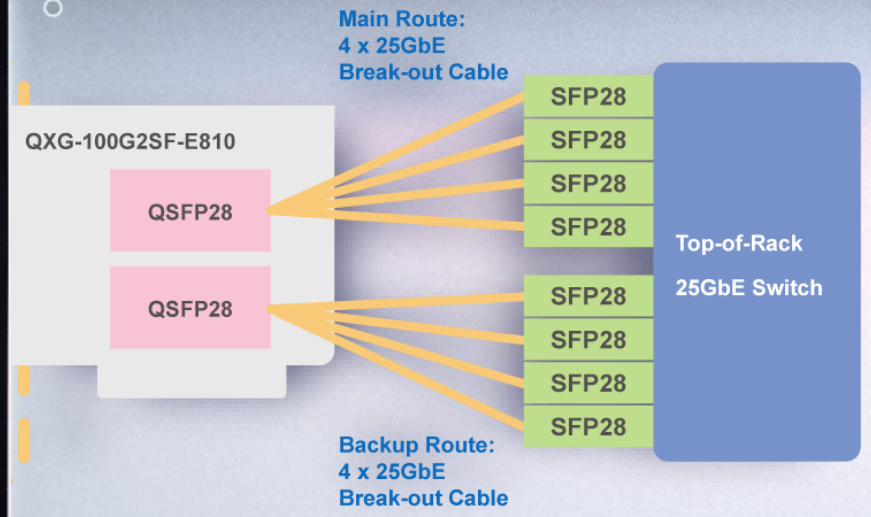
Upgrade TS-h2490FU to 100GbE for more powerful enterprise applications

- Upgrade to 100G network environment with TS-h2490FU installed with QXG-100G2SF-E810 pairing with 100GbE switch
- Supports splitting ports in later QTS/QuTS hero versions for more flexible options e.g. Connecting to a 25GbE switch or connecting to 4 x 25GbE / 8 x 10GbE devices

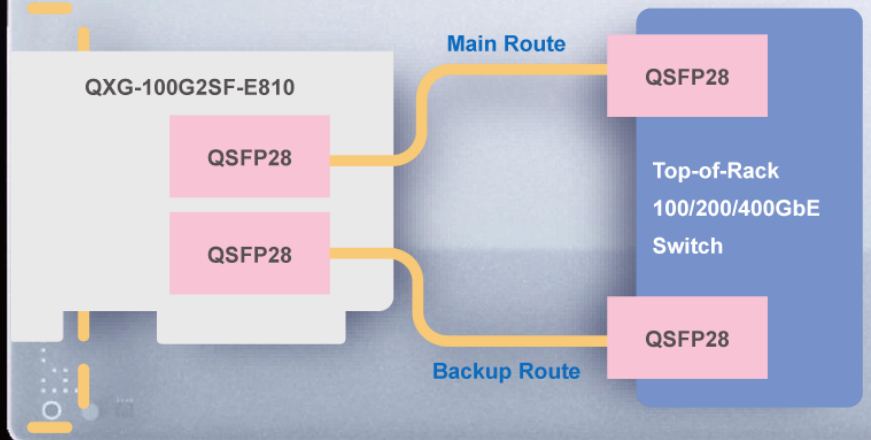


Mellanox 25 / 100 GbE Switch (SN2010)

Pair with high-speed switches for high-performance, low-latency data centers



Use a QSFP28 – 4 SFP28 cable to connect to the 25GbE switch



Use a QSFP28 cable to connect to the 25Gb switch

The QXG-100G2SF-E810 network expansion card can be connected to a switch either with a QSFP28 cable or a QSFP28 to (4) SFP28 cable. You can also configure network redundancy to achieve **network failover** via the switch for continuous service and high availability.

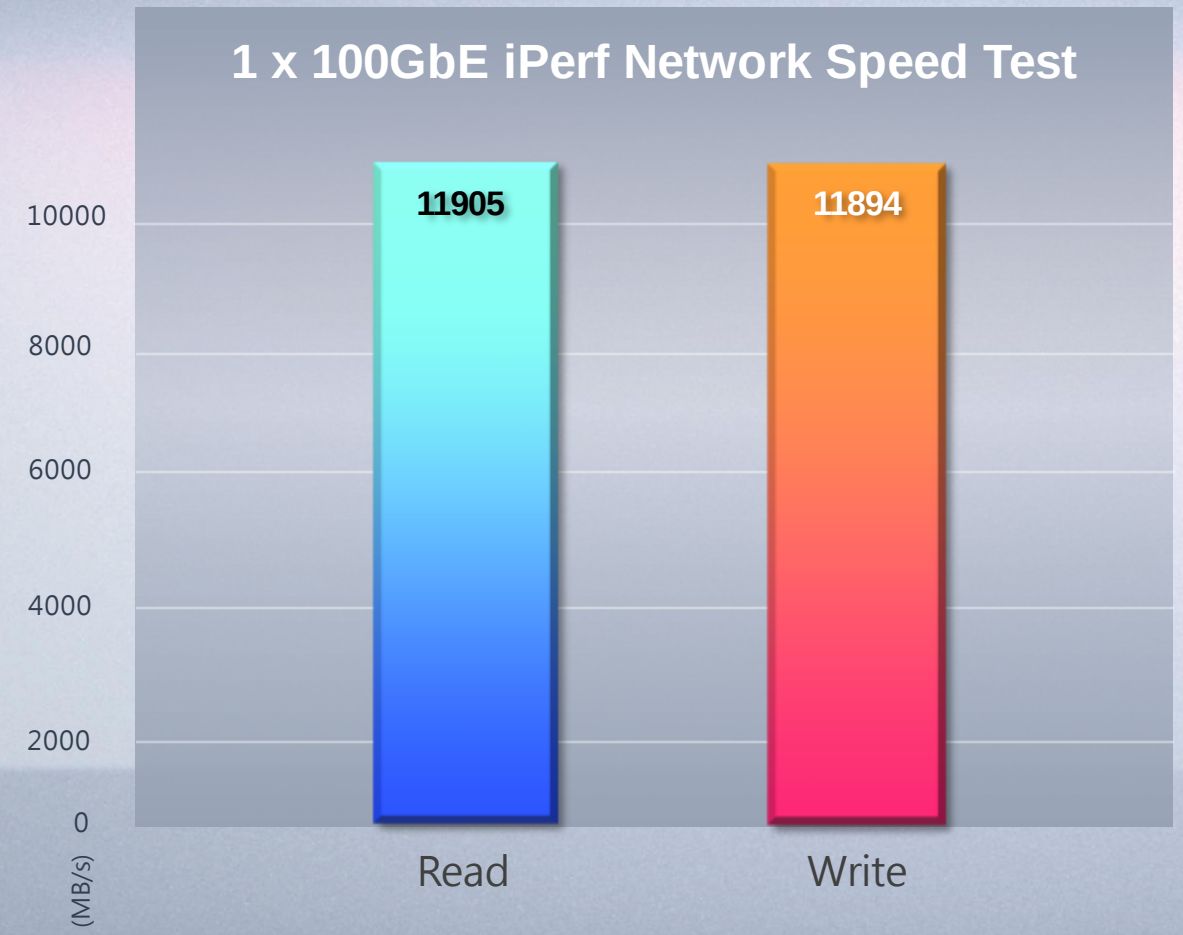
CAB-DAC15M-QSFP28-B4

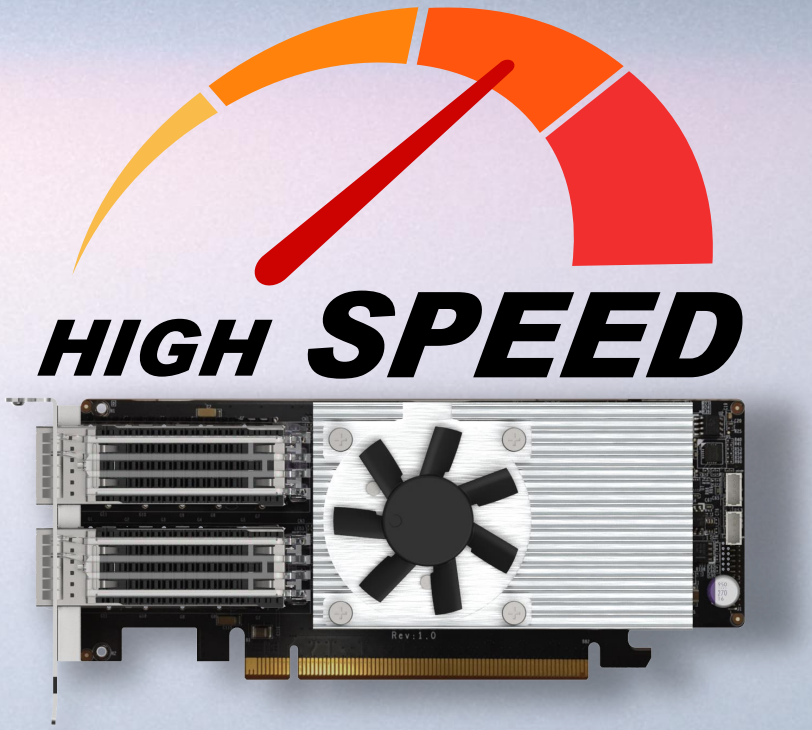
CAB-DAC15M-QSFP28

QXG-100G2SF-E810

100GbE Performance

QXG-100G2SF-E810 transmission performance at near full-speed 99Gbps





Test Environment:
NAS| TS-h2490FU-7232P-64GB with QXG-100G2SF-E810
Client PC| OS: Ubuntu 20.04
CPU: Xeon Scalable
RAM: 64GB
NIC: QXG-100G2SF-E810
MTU 9000