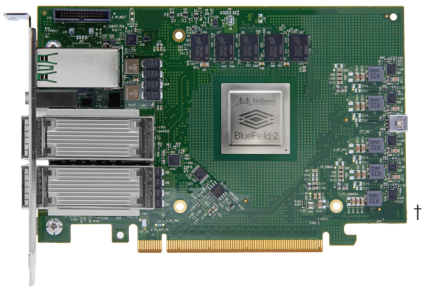
BlueField®-2



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BF2500

BlueField®-2 Dual Port 100Gb/s Controller Card for Ethernet

Industry-leading application acceleration for the most demanding storage and cloud platform workloads

Mellanox BF2500 BlueField-2 Dual Port 100Gb/s Controller Card is the perfect solution for managing backend NVMe storage, All Flash Arrays (AFA), compute and storage disaggregation, and hyperconverged systems. The BlueField-2 Dual Port 100Gb/s Controller Card delivers the highest NVMe-oF target performance, reducing TCO and increasing ROI.

Leading the Next Generation of NVMe-oF

Mellanox is at the forefront of the NVMe-oF revolution. As a leading provider of NVMe-oF network adapters, Mellanox was first to market with 25, 40, 50, and 100 GbE adapters, and is leading the next generation of Remote Direct Memory Access (RDMA) products, which are at the base of NVMe-oF technology. By deploying Mellanox BF2500 Controller Cards, customers gain the best of all worlds: the advantage of Mellanox's vast and proven success in RoCE and NVMe-oF deployments with high performance I/O acceleration and networking.

Ideal Solution for JBOF and JBOD System

Mellanox BlueField-2 I/O Processing Unit (IPU) is a highly integrated and efficient controller, optimized for NVMe storage systems, Network Functions Virtualization (NFV), Cloud and Machine Learning workloads.

BlueField-2 integrates all the discrete components of a storage system appliance into a single chip, including Arm core CPUs, PCIe switch and a network controller, making it the premier solution for building Just-a-Bunch-Of-Flash (JBOF) systems, All-Flash-Array and storage appliances for NVMe over Fabrics.

With an integrated NVMe-oF offload accelerator, the BF2500 Controller Card has a superior performance advantage over existing JBOF systems, significantly reducing storage transaction latency, while increasing IOPs (I/O operations per second).

Best-in-Class Storage Performance

The BF2500 Controller Card is a standard PCIe card that can transform existing JBOF systems into NVMe-oF compliant solutions, simply by plugging the card into the PCIe slot. It supports up to 16 PCIe Gen 4.0 lanes and can enable connectivity for up to 8 SSD drives without the need for an external PCIe switch. The card's compact form factor allows customers to install multiple BlueField-2 controller cards in a single system to support a larger number of SSDs as well as high-availability storage architecture.

The BF2500 storage controller delivers industry-leading NVMe-oF performance, coupled with advanced built-in hardware storage offloads, including compression/decompression, data deduplication, signature handover T10-DIF, distributed RAID and erasure coding offloads.

BENEFITS

- Increases ROI by leveraging the NVMe-oF accelerator to maximize performance
- Supports up to 8 NVMe SSDs without requiring an external PCIe switch
- Can be employed as a GPU controller card for Machine Learning systems
- Leading NVMe-oF performance
- Advanced storage accelerations

FEATURES

- Single or dual QSFP56 port(s) supporting 10/25/40/50/100/200 GbE
- Integrated BlueField-2 IPU
- 16GB DDR4 SODIMM
- 8GB eMMC flash memory for software
- FHHL standard PCIe Gen 4.0 x16
- 1GbE out-of-band management port

† For illustration only. Actual products may vary.

The integration of cryptography engines like AES-XTS data-at-rest encryption and public key acceleration simplify the implementation of security applications. These enhanced security capabilities reduce the threat of exposure and minimize risk, while enabling real-time prevention, detection and responses to potential storage threats.

Software Support

The BF2500 Controller Card is shipped with Yocto – a Linux distribution operating system (OS) – which includes the Mellanox OFED stack, and is capable of running all customer-based Linux applications seamlessly.

BF2500 also supports CentOS and Ubuntu Linux distribution, and has an out-of-band 1GbE management interface.

Features

BF2500 Controller Card

- FHHL form factor
- BlueField-2 IPU with 8 Armv8 A72 cores (64 bit)
- PCIe Gen 4.0 x16 golden finger connector (root complex)
- Single or dual port QSFP56 interface(s) supporting 10/25/40/50/100/200 GbE
- NC-SI RBT
- External PCIe power connector
- CPLD for SSD control signals expansion
- 8GB eMMC memory for BIOS and OS
- SPI flash for NIC firmware

DRAM DIMM Support

- 1 channel DDR4, 64bit + 8bit ECC
- 8/16GB 3200MT/s DDR4 soldered-down memory

Hardware Accelerations

Security

- IPsec/TLS data-in-motion encryption
  - AES-GCM 128/256 bit key
- AES-XTS 256/512 bit data-at-rest encryption
- SHA 256 bit hardware acceleration
- Titan IC regular expression (RXP) acceleration engine
- Arm A64, A32 & T32 cryptography instructions for:
  - AES, SHA-1, SHA-224, and SHA-256
  - Finite field arithmetic
- Hardware Public Key Accelerator
  - RSA, Diffie-Hellman, DSA, ECC, EC-DSA,EC-DH
- True Random Number Generator (TRNG)

Storage

- NVMe over Fabric offloads for target
- Erasure coding and RAID offloads
- T10-DIF signature handover
- Dedup accelerations
- DMA accelerations
- Compression and decompression acceleration

Table 1 - Part Numbers and Feature Set Breakdown

OPN	Max. Speed	No. of Ports	PCIe Support	Crypto Support*	DDR Memory	1GbE OOB	Form Factor
MBF2H516B-CENOT	100GbE	2x QSFP56	Gen 4.0 x16	Crypto disabled	16GB on-board	Yes	FHHL Tall Bracket
MBF2H516B-CEEOT**				Crypto enabled			
MBF2H515B-VENOT**	200GbE	1x QSFP56	Gen 4.0 x16	Crypto disabled	16GB on-board	Yes	FHHL Tall Bracket
MBF2H515B-VEEOT**				Crypto enabled			

Notes: * Hardware Root of Trust (RoT) or secure boot is not supported on these models, please contact Mellanox for additional information.
** Please contact Mellanox for additional information.

Support

For information about Mellanox support packages, please contact your Mellanox Technologies sales representative or visit our Support page.

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