Today's network technologies drive OEMs to seek innovative, scalable and cost effective designs for dealing with the exponential growth of data. The Mellanox BlueField-2 Reference Platform provides a multi-purpose fully-programmable hardware environment for evaluation, development and running of software solutions, reducing time-to-market, and increasing product development and runtime efficiency.

The platform delivers all the features of the BlueField-2 I/O Processing Unit (IPU) in a convenient form factor, making it ideal for a range of software solutions in the most demanding markets. Features include two 100Gb/s Ethernet or InfiniBand interfaces, eight Arm cores, BlueField-2 storage controller with 32GB DDR4 memory, a PCIe x16 slot, and an NVMe-ready midplane for SSD connectivity.

BlueField-2 Platform for Storage Appliances

Today's fast storage technologies drive storage OEMs to seek innovative, scalable and cost effective designs for their applications. Powered by the BlueField-2 IPU, the platform offers a unique combination of on-board capabilities and NVMe-readiness, creating an ideal environment for storage appliance development.

Platform Highlights

- Leverages the processing power of Arm® cores for storage applications such as All-Flash Arrays using NVMe-oF, Ceph, Lustre, iSCSI/TCP offload, Flash Translation Layer, RAID/Erasure coding, data compression/decompression, and deduplication.
- In high-performance storage arrays, BlueField-2 serves as the system’s main CPU, handling storage controller tasks and traffic termination.
- The integration of cryptography engines, including AES-XTS data-at-rest encryption and public key acceleration, simplify the implementation of security applications.
- Supports up to 8 front-mounted 2.5” disk drives in bays that are routed to an NVMe-ready midplane within the enclosure. The system can be configured as a storage JBOD with 8 drives using PCIe Gen 4.0 x2 lanes, or with 4 drives with PCIe Gen 4.0 x4 lanes.

BlueField-2 Platform for Machine Learning

The platform supports connectivity of a GPU via its PCIe x16 Gen 4.0 interface, providing a cost effective and integrative solution for Machine Learning appliances. By utilizing RDMA and RoCE technology, the BlueField-2 network controller data path hardware delivers low latency and high throughput with near-zero CPU cycles.
The platform offers GPUDirect® RDMA technology, enabling the most efficient data exchange between GPUs and with the Mellanox high speed interconnect, optimizing real-time analytics and data insights.

**NVMe-Ready Midplane**

The modular chassis midplane supports up to eight hot-swappable 2.5” SSDs. The midplane also supports an I2C switch to enable connectivity of the SMBUS from the platform’s Baseboard Management Controller (BMC) to each SSD, and an on-board clock generator/buffer.

**Software Support**

BlueField-2 reference platform is shipped with Ubuntu — a Linux commercial operating system — which includes the Mellanox OFED stack, and is capable of running all customer-based Linux applications seamlessly. The platform also supports CentOS and Yocto Linux Distribution. The platform provides a BMC running OpenBMC to manage the entire system.

Reference platform customers can run the Linux distribution of their choice.

**Figure 1. 8 x SSD Configuration**

**Figure 2: BlueField-2 Reference Platform**

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**Features**

- 2U 19” enclosure
- ATX form factor motherboard
- BlueField-2 IPU with 8 Armv8 A72 cores (64-bit)
- PCIe Gen 3.0/4.0 x16 expansion connector
- Dual QSFP56 ports supporting:
  - Ethernet: 40/50/100 GbE
  - InfiniBand: EDR
  - 10/25 Gb/s supported with QSA56 port adapter
- PCIe riser enabling 2.5” NVMe SSD disk support:
  - 4 x PCIe Gen 4.0 x4 lanes
  - 8 x PCIe Gen 4.0 x2 lanes
- Single 875W hot-plug power supply
- Integrated BMC
- 32GB eMMC flash memory for software
- Up to 32GB DDR4
- 3 x 80mm fan cartridges

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**Table 1 - Part Numbers and Descriptions**

<table>
<thead>
<tr>
<th>OPN</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBE2200B-BD1</td>
<td>2U BlueField®-2 Reference Platform. Supports option for 1 Controller, up to 8 SSDs or 1 GPU</td>
</tr>
<tr>
<td>MBE2201B-BE1</td>
<td>2U BlueField®-2 Reference Platform including 2 x 100Gb/s VPI Controller with 16GB DDR4, Crypto Enabled. Supports option for up to 8 SSDs or 1 GPU</td>
</tr>
</tbody>
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