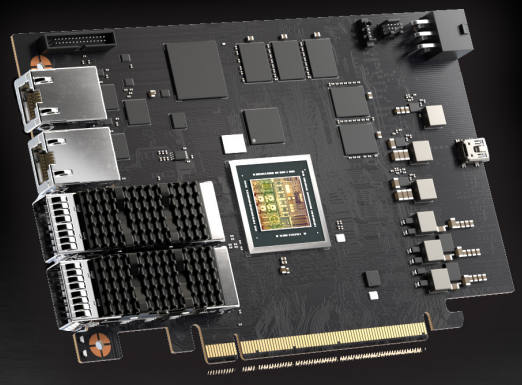


NVIDIA BLUEFIELD-2 DPU

Data Center Infrastructure on a Chip

The NVIDIA® BlueField®-2 data processing unit (DPU) is the world's first data center infrastructure-on-a-chip optimized for traditional enterprises' modern cloud workloads and high performance computing. It delivers a broad set of accelerated software-defined networking, storage, security, and management services with the ability to offload, accelerate and isolate data center infrastructure. With its 200Gb/s Ethernet or InfiniBand connectivity, the BlueField-2 DPU enables organizations to transform their IT infrastructures into state-of-the-art data centers that are accelerated, fully programmable, and armed with "zero trust" security to prevent data breaches and cyber attacks.

By combining the industry-leading NVIDIA ConnectX®-6 Dx network adapter with an array of Arm® cores and infrastructure-specific offloads, BlueField-2 offers purpose-built, hardware-acceleration engines with full software programmability. Sitting at the edge of every server, BlueField-2 empowers agile, secured and high-performance cloud and artificial intelligence (AI) workloads, all while reducing the total cost of ownership and increasing data center efficiency.

The NVIDIA DOCA™ software framework enables developers to rapidly create applications and services for the BlueField-2 DPU. NVIDIA DOCA makes it easy to leverage DPU hardware accelerators, providing breakthrough data center performance, efficiency and security.

Key Software-Defined, Hardware-Accelerated Applications

Networking

vSwitch/vRouter, NAT, load balancer, NFV

Storage

NVMe™ over fabrics (NVMe-oF™), elastic storage virtualization, hyper converged infrastructure (HCI), encryption, data integrity, compression, data deduplication

Security

Next-Generation firewall, IDS/IPS, root of trust, micro-segmentation, DDOS prevention

KEY FEATURES

Security

- Hardened isolation layer
- Hardware root of trust
- IPsec/TLS and AES-XTS encryption acceleration
- Connection tracking for stateful firewall and IDS/IPS
- Regular expression (RegEx) matching processor

Storage

- NVIDIA GPUDirect® Storage
- Elastic block storage enabled by BlueField SNAP storage virtualization
- Compression and decompression acceleration
- NVMe-oF acceleration
- VirtIO-blk acceleration

Networking

- RoCE, Zero Touch RoCE
- GPUDirect
- SDN acceleration powered by NVIDIA ASAP² - Accelerated Switching and Packet Processing®
- Overlay network offloads including VXLAN

Management

- Authenticated product life-cycle management
- Telemetry agents

Portfolio

- Dual ports of up to 100Gb/s, or a single port of 200Gb/s Ethernet or InfiniBand
- 8GB / 16GB / 32GB of on-board DDR4 memory
- Card form factors: HHHL, FHHL, and OCP 3.0 SFF
- M.2 / U.2 connectors for direct attached storage
- 1GbE out-of-band management port

Features

Network and Host Interfaces

Network Interfaces

- Ethernet - Dual ports of 10/25/50/100Gb/s, or a single port of 200Gb/s
- InfiniBand - Dual ports of EDR / HDR100, or single port of HDR

PCI Express Interface

- 8 or 16 lanes of PCIe Gen 4.0
- PCIe switch bi-furcation with 8 downstream ports

ARM/DDR Subsystem

Arm Cores

- Up to 8 Armv8 A72 cores (64-bit) pipeline
- 1MB L2 cache per 2 cores
- 6MB L3 cache with plurality of eviction policies

DDR4 DIMM Support

- Single DDR4 DRAM controller
- 8GB / 16GB / 32GB of on-board DDR4
- ECC error protection support

Hardware Accelerations

Security

- Secure boot with hardware root-of-trust
  - Secure firmware update
  - Cerberus compliant
- Regular expression (RegEx) acceleration
- 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
- Hardware public key accelerator
  - RSA, Diffie-Hellman, DSA, ECC, EC-DSA, EC-DH
- True random number generator (TRNG)

Storage

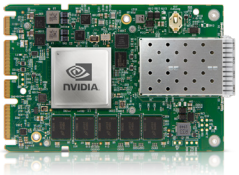
- BlueField SNAP - NVMe™ and VirtIO-blk
- NVMe-oF™ acceleration
- Compression and decompression acceleration
- Data hashing and deduplication
- M.2 / U.2 connectors for direct attached storage

Networking

- RoCE, Zero Touch RoCE
- Stateless offloads for:
  - TCP/UDP/IP
  - LSO/LRO/checksum/RSS/TSS/HDS
  - VLAN insertion/stripping
- SR-IOV
- VirtIO-net
- Multi-function per port
- VMware NetQueue support
- Virtualization hierarchies
- 1K ingress and egress QoS levels

BlueField-2 DPU - 2x 25Gb/s HHHL form factor

BlueField-2 DPU - 2x 100Gb/s FHHL form factor



BlueField-2 DPU - 2x 25Gb/s OCP3.0 SFF form factor

Ordering Information

For information about NVIDIA ordering information, please contact your NVIDIA sales representative or visit our Nvidia BlueField-2 User Guide index page:

NVIDIA BlueField-2 Ethernet boards

NVIDIA BlueField-2 InfiniBand/VPI boards

NVIDIA BlueField-2 for OCP3.0

Learn more

Learn more about **NVIDIA Blue-Field-2 DPU**