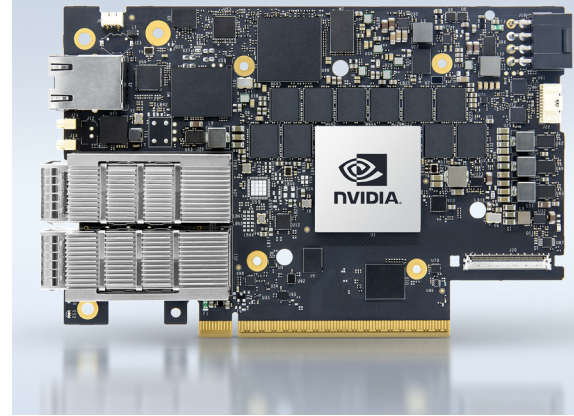




NVIDIA BlueField-3 DPU

400Gb/s infrastructure compute platform



The NVIDIA® BlueField®-3 data processing unit (DPU) is the 3rd-generation infrastructure compute platform that enables organizations to build software-defined, hardware-accelerated IT infrastructures from cloud to core data center to edge. With 400Gb/s Ethernet or NDR 400Gb/s InfiniBand network connectivity, BlueField-3 DPU offloads, accelerates, and isolates software-defined networking, storage, security, and management functions in ways that profoundly improve data center performance, efficiency, and security.

Providing powerful computing, and a broad range of programmable acceleration engines in the I/O path, BlueField-3 is perfectly positioned to address the infrastructure needs of the most demanding applications, while delivering full software backward compatibility through the NVIDIA DOCA™ software framework.

BlueField-3 DPUs transform traditional computing environments into high-performance, efficient and sustainable data centers, allowing organizations to run application workloads in secure, multi-tenant environments. Decoupling data center infrastructure from business applications, BlueField-3 enhances data center security, streamlines operations and reduces total cost of ownership. Featuring NVIDIA's in-network computing technology, BlueField-3 enables the next generation of supercomputing platforms, delivering optimal bare-metal performance and native support for multi-node tenant isolation.

Portfolio

- > 1 or 2 ports with up to 400Gb/s connectivity
- > 32GB on-board DDR5 memory
- > Form factors: HHHL, FHHL
- > 1GbE out-of-band management port
- > Integrated BMC

Key Software-Defined, Hardware-Accelerated Applications



Cloud Networking

Cloud overlay, SDN acceleration, NAT, load balancer, NFV, video streaming



Storage

NVMe™ over Fabrics (NVMe-oF™), NVMe/TCP™, elastic storage, hyper converged infrastructure (HCI)



Security

Distributed next-generation firewall, IDS/IPS, root of trust, micro-segmentation, DDOS prevention



HPC / AI

Cloud-native supercomputing, multi-tenancy and security, communication accelerations



Telco and Edge

Cloud RAN, virtualized edge gateways, VNF acceleration, edge microservers

Features

Network and Host Interfaces

Network Interfaces

- > 1 or 2 ports with up to 400Gb/s Ethernet or NDR InfiniBand connectivity

PCI Express Interface

- > 32 lanes of PCIe Gen 5.0
- > PCIe switch bi-furcation of up to 16 downstream ports

Compute and Memory

Arm CPU Cores

- > Up to 16 Armv8.2+ A78 Hercules cores (64-bit)
- > 8MB L2 cache
- > 16MB LLC system cache

Programmable Datapath Accelerator

- > 16 cores, 256 threads
- > Programmability through DOCA
- > Heavy multi-threading applications acceleration

DDR DIMM Support

- > Dual DDR5 5600MT/s DRAM controllers
- > 32GB on-board DDR5
- > ECC error protection support

Hardware Accelerations

Security

- > Platform security
 - > Secure boot with hardware root-of-trust
 - > Secure firmware update
 - > On-board flash encryption
 - > Device attestation
- > Functional isolation layer
- > Regular expression (RegEx) matching processor
- > IPsec/TLS/MACSec 128/256bit data-in-motion encryption

- > PSP security protocol (PSP)
- > AES-GCM 128/256bit key
- > AES-XTS 256/512bit data-at-rest encryption
- > Connection tracking for statefull firewall
- > Public key accelerator (PKA)
- > True random number generator (TRNG)

Storage

- > BlueField SNAP - Elastic block storage - NVMe™ and VirtIO-blk
- > NVMe-oF™ and NVMe/TCP™ acceleration
- > Decompression engine
- > Erasure coding for RAID implementation

Networking

- > RoCE, Zero Touch RoCE
- > ASAP² - Accelerated Switch and Packet Processing® for SDN and VNF acceleration
- > Single Root I/O Virtualization (SR-IOV)
- > VirtIO acceleration
- > Overlay network acceleration
 - > VXLAN, Geneve, NVGRE
- > Programmable flexible parser: user-defined classification
- > Connection tracking (L4 firewall)
- > Flow mirroring, sampling and statistics
- > Header rewrite
- > Hierarchical QoS
- > Stateless TCP offloads

HPC/AI Accelerations

- > HPC / AI All-to-All engine
- > NVIDIA GPUDirect
- > NVIDIA GPUDirect Storage (GDS)
- > HPC MPI Tag Matching

Advanced Timing and Synchronization

- > IEEE 1588v2 (any profile)
- > G.8273.2 Class C
- > PTP hardware clock (PHC)
- > Line rate hardware timestamp
- > SyncE
- > G.8262.1 (eEEEC)
- > Configurable PPS In and PPS Out
- > Time triggered scheduling
- > Time-based SDN acceleration

Boot Options

- > Secure boot (RSA authenticated)
- > Remote boot over Ethernet
- > Remote boot over iSCSI
- > PXE and UEFI

Management

- > 1GbE out-of-band management port
- > NC-SI, MCTP over SMBus, and MCTP over PCIe
- > PLDM for Monitor and Control DSP0248
- > PLDM for Firmware Update DSP026
- > I2C interface for device control and configuration
- > SPI interface to flash
- > eMMC memory controller
- > UART
- > USB

Ready to Get Started?

For ordering information, please contact your NVIDIA sales representative or visit the **NVIDIA BlueField-3 User Guide**

To learn more about the NVIDIA BlueField-3 visit:
www.nvidia.com/dpu

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