DATA PROCESSING UNIT
THE THIRD PILLAR OF THE ACCELERATED DATA CENTER

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THE Third Pillar of the Data Center
The Accelerated Data Center Is the New Unit of Computing

AI & ML
Accelerated Computing

GPU
GPU Accelerates AI and Machine Learning
Every workload will benefit from accelerated AI

CPU

DPU
Data Processing Unit
Software-Defined, Hardware-Accelerated

DPU Accelerates Data Intensive Tasks
THE DATA PROCESSING UNIT

Offload, Accelerate, Isolate

TRADITIONAL SERVER

Software-defined Networking
Software-defined Storage
Software-defined Security
Infrastructure Management

CPU

VMs

Containers

NVIDIA NIC

Acceleration Engines

DPU-ACCELERATED SERVER

Software-defined Networking
Software-defined Storage
Software-defined Security
Infrastructure Management

CPU

VMs

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NVIDIA DPU with Arm Cores & Accelerators

Acceleration Engines

From Hardware Appliances

Software-Defined Data Center Infrastructure on CPU

Software-Defined Hardware-Accelerated Data Center Infrastructure on DPU
NVIDIA BLUEFIELD-3
First 400Gb/s Data Processing Unit

22 Billion Transistors
400Gb/s Ethernet & InfiniBand Connectivity (1-4 Ports)
PCle Switch Gen 3/4/5 x32+x4
400Gb/s Crypto / Security Acceleration
18M IOP/s Elastic Block Storage
300 Equivalent x86 Cores
Arm A78 16-cores
DDR5-5600 memory controllers
INTRODUCING DOCA
Software Application Framework for BlueField DPUs

DOCA enables developers to rapidly create applications and services on top of NVIDIA DPUs

DOCA is for DPUs what CUDA is for GPUs

Certified reference applications, APIs, & partner solutions

Protects developer investment for future DPUs

Rich partner ecosystem

![Diagram showing DOCA features and partners]
• **Near Line-rate Performance:** Protect network traffic at speeds up to 100Gb/s
• **Amazing Acceleration:** 6x throughput improvement (15G to 93G)
• **Infinite Efficiency:** Drop CPU consumption from 12 cores to zero cores
• **Substantial TCO Savings:** Up to 150% CapEx Savings compared to legacy hardware
SUMMARY

NVIDIA DPU Enables the Data Center as the New Unit of Computing

- The CPU can no longer do it all
- Must offload & isolate server infrastructure tasks by using a DPU - networking, storage, security
- Effective DPU must offer hardware acceleration and security isolation
- DPU can accelerate storage networking, NVMe-oF, storage virtualization, encryption, compression, etc.
- To be effective, a DPU must support a broad software eco-system - to simplify that, NVIDIA offers DOCA
- NVIDIA is committed to line rate performance with forward and backward compatibility between generations of BlueField DPU’s