



Mellanox Introduces Revolutionary ConnectX-6 Dx and BlueField-2 Secure Cloud SmartNICs and I/O Processing Unit Solutions

ConnectX-6 Dx and BlueField-2 Provide 200 Gb/s Ethernet and InfiniBand Connectivity, Enabling Next Generation of Clouds, Secure Data Centers and Storage Platforms

Mellanox Technologies, Ltd., a leading supplier of high-performance, end-to-end smart interconnect solutions for data center servers and storage systems, today introduced ConnectX-6 Dx and BlueField-2 - next-generation cloud [SmartNICs](#) and I/O Processing Unit (IPU) solutions, delivering unprecedented data center security, performance and efficiency at massive scale, for any workload. Continuing Mellanox's innovation in high-performance cloud fabrics, ConnectX-6 Dx and BlueField-2 make the impossible possible by introducing cutting-edge hardware acceleration engines and best-in-class software programmability to mission-critical applications. They deliver new levels of security and efficiency with the highest return on investment (ROI) for hyperscale, enterprise, and telco environments.

ConnectX-6 Dx SmartNICs provide up to two ports of 25, 50 or 100Gb/s, or a single port of 200Gb/s, Ethernet connectivity powered by 50Gb/s PAM4 SerDes technology and PCIe 4.0 host connectivity. The ConnectX-6 Dx innovative hardware offload engines include IPsec and inline TLS data-in-motion cryptography, advanced network virtualization, RDMA over Converged Ethernet (RoCE), and NVMe over Fabrics (NVMe-oF) storage accelerations.

The BlueField-2 IPU integrates all the advanced capabilities of ConnectX-6 Dx with an array of powerful Arm processor cores, high performance memory interfaces, and flexible processing capabilities in a single System-on-Chip (SoC), supporting both Ethernet and InfiniBand connectivity up to 200Gb/s. BlueField-2-based embedded controllers are ideal for building highly efficient and cost-effective flash storage, security, IoT and edge computing platforms. BlueField-2 SmartNICs can act as a coprocessor that puts a computer in front of the computer to transform bare-metal and virtualized environments using advanced software-defined networking, NVMe SNAP storage disaggregation, and enhanced security capabilities. Furthermore, BlueField-2 delivers unmatched performance and efficiency for AI workloads in the cloud or at the network edge.

"We are excited to introduce the ConnectX-6 Dx and BlueField-2 architectures, providing groundbreaking acceleration engines for next-generation cloud data centers," said Yael Shenhav, vice president, Ethernet NIC and SoC at Mellanox. "Built on the success of our award-winning ConnectX and BlueField product families, ConnectX-6 Dx and BlueField-2 set new records in high-performance networking, allowing our customers and partners to build highly secure and efficient compute and storage infrastructures to increase productivity and reduce total cost of ownership."

"With cloud computing becoming the norm, enterprises increasingly rely on the underlying data center infrastructures to deploy workloads across public, private and edge domains," said Baron Fung, director at Dell'Oro Group. "Hence, there is a growing need for advanced, secure, high performance SmartNICs. This is one of the reasons why we forecast the SmartNIC market to grow at a 40 percent CAGR surpassing \$500 million by 2023."

Secure Cloud and Data Storage

ConnectX-6 Dx and BlueField-2 are uniquely positioned to address the immense cloud security challenges by delivering protection at every data center server, storage, and edge computing endpoint. ConnectX-6 Dx provides a wide range of security-centered innovations, including IPsec, TLS, and AES-XTS built-in cryptographic acceleration, and Hardware Root of Trust. In addition to the above capabilities, BlueField-2 adds accelerated key management, integrated Regular Expression (RegEx) pattern detection, secure hash computation, and more.

Highly Efficient and Scalable Bare Metal and Virtualized Clouds

ConnectX-6 Dx and BlueField-2 deliver the latest generation of Mellanox's ASAP2 - Accelerated Switch and Packet Processing® technology - with built-in SR-IOV, Open vSwitch (OVS), and VirtIO hardware accelerators. Introducing additional network virtualization offloads, enhanced programmability and extreme scale, ConnectX-6 Dx and BlueField-2 enable highly efficient hyperscale cloud and SDN/NFV data centers, with a smooth transition from previous ConnectX and BlueField generations

Accelerate Storage, Big Data and AI with Best-in-Class RDMA

ConnectX-6 Dx and BlueField-2 provide unparalleled RDMA performance over Ethernet and InfiniBand with enhanced programmability and robustness, for accelerating the most demanding workloads at extreme scale. Advanced traffic management innovations enable communications to run seamlessly over ordinary networks, making RoCE the enterprise-grade, easy-to-use, network transport technology of choice.

Supporting Quotes:

"Baidu is an AI cloud giant tasked with delivering results at the speed of thought," said Liu Ning, director of system department, Baidu. "Therefore, we have partnered with Mellanox, the leader in high-performance networking, whose high-speed connectivity solutions today supports Baidu's machine learning platforms. We look forward to this new release of Mellanox's programmable cloud SmartNICs and IPU to deliver best-in-class network performance for accelerating scalable AI-driven applications."

"IBM's enterprise server solutions are designed to deliver the best performance for the most demanding workloads, while providing cutting-edge security and reliability," said Monica Aggarwal, vice president of Cognitive Systems Development. "We look forward to integrating the new Mellanox SmartNIC family into our product portfolio for building highly efficient secured cloud data centers."

"Through our partnership with Mellanox and native support of the ConnectX SmartNIC family in F5 application services, including traffic optimization, CGNAT, and DNS, we have solved several VNF specific challenges for our joint customers," said James Feger, vice president and general manager, service provider at F5 Networks. "Taking advantage of the offload capabilities in Mellanox ConnectX-5, we delivered exponential performance improvements in DNS QPS, as well as greater scale and performance for our security workloads. We look forward to supporting the new Mellanox ConnectX-6 Dx to help our customers continue to scale their infrastructures and achieve even greater results."

"Our partnership with Mellanox in high-performance computing (HPC) and AI is a key pillar of the Lenovo 'From Exascale to Everscale™' strategy to make the technologies of Exascale computing accessible to customers of all sizes," said Scott Tease, executive director of High-Performance Computing and Artificial Intelligence, Lenovo Data Center Group. "The new Mellanox portfolios of SmartNICs and IPU will help to make 'Exascale to Everscale' a reality, delivering secure, efficient, high-speed connectivity for the data centric future."

"At Meituan we leverage machine learning and artificial intelligence algorithms at massive scale for offering a wide selection of e-commerce services. Deploying Mellanox's end-to-end technologies has yielded excellent application performance results turning data into actionable value for our growing customer base," said Michael Zhu, VP of infrastructure technology at Meituan, China's leading e-commerce platform for services. "We are excited to see Mellanox introducing its new portfolios of secure cloud SmartNICs and IPU for accelerating scalable AI workloads."

"The Virtualized Cloud Services (VCS) solution by Nuage Networks from Nokia is integrated with Mellanox ConnectX SmartNIC family to deliver unprecedented performance for Telco Cloud deployments," said Saurabh Sandhir, head of product management at Nuage Networks. "Over time as Telco Cloud customers upgrade their networks for Network Function Virtualization (NFV), this innovative integration will be forward compatible to future generation Mellanox SmartNICs to achieve even higher performance. In addition, Nuage Networks' Telco Cloud portfolio and customers will benefit from the advanced security and virtualization offloads of Mellanox ConnectX-6 Dx and BlueField-2 SmartNICs."

"Deep neural network-based AI for autonomous vehicles and other machine learning training requires massive amounts of networking bandwidth and RDMA to connect the GPU systems to each other and to storage, which is why NVIDIA DGX AI servers and DRIVE Constellation driving simulation solutions take advantage of Mellanox InfiniBand and Ethernet networking connectivity," said Charlie Boyle, vice president and general manager of DGX Systems at NVIDIA. "We look forward to the new networking, security, and storage capabilities in the Mellanox ConnectX-6 Dx and BlueField-2, which we expect will greatly accelerate training and inference workloads in the data center and at the edge."

"As we work to deliver flexible and open hybrid cloud infrastructure to enterprises around the world, the ability to more securely and efficiently provision and deploy workloads across bare-metal, virtual and private and public cloud environments become a critical need," said Chris Wright, senior vice president and chief technology officer at Red Hat. "This need pairs with enterprises wanting to derive value from data at a reduced cost, with hardware acceleration playing an important role for the performance-sensitive workloads driving these insights, like AI/ML, as they are deployed from the edge to the data center. We look forward to collaborating with Mellanox to enable open source software solutions that can take advantage of these new technologies."

"Ubuntu is at the forefront of large cloud infrastructure deployments," said Stephan Fabel, director of product at Canonical. "The new Mellanox family of SmartNICs is ideal for delivering advanced offloading and new functionalities for a range of use-cases, providing an enhanced data center management experience when combined with the extensibility of the Ubuntu ecosystem. We proudly partner with Mellanox to take the BlueField-2 IPU-based SmartNICs running Ubuntu to market."

"UCloud offers a wide range of cloud computing services through its global data center infrastructures. Deploying Mellanox's SmartNICs throughout our cloud data centers has already enabled us to meet the increasing demand for consistent and predictable performance," said Leo Xu, director of Network Group, UCloud. "We are excited about Mellanox's new programmable IPU introducing software-defined networking and storage disaggregation technologies across our bare-metal cloud environments."

Additional Information:

Visit Mellanox at booth #1463 at VMworld 2019, San Francisco, CA on August 25-28, 2019, to learn about the benefits of the Mellanox ConnectX-6 Dx and BlueField-2, the industry's most advanced secure-cloud SmartNIC devices.

Supporting Resources:

- Learn more on [ConnectX-6 Dx SmartNICs](#)
- Learn more on [BlueField-2 IPU and Programmable SmartNICs](#)
- Check out how [Mellanox BlueField-2 SmartNICs transform bare-metal clouds](#)
- Review the [Mellanox Blog](#) supporting the release

About Mellanox

Mellanox Technologies is a leading supplier of end-to-end InfiniBand and Ethernet smart interconnect solutions and services for servers and storage. Mellanox interconnect solutions increase data center efficiency by providing the highest throughput and lowest latency, delivering data faster to applications and unlocking system performance capability. Mellanox offers a choice of fast interconnect products: adapters, switches, cables and transceivers, software and silicon that accelerate application runtime and maximize business results for a wide range of markets including high performance computing, enterprise data centers, Web 2.0, cloud, storage and financial services.

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Alex Shapiro
Enterprise Networking
1-415-608-5044
ashapiro@nvidia.com