Enterprise Storage Newsletter

G2M COMMUNICATIONS

November 2020

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## Updates to KumoScale and New SSD Products

KIOXIA

Achieving "high-energy" product launches in a virtual setting may be more challenging than doing so at live tradeshows. However, Kioxia took advantage of the virtual format of the [2020 Flash Memory Summit (FMS)](#) to launch two new SSD products, and used [Kubecon 2020](#) to launch a significant update to their KumoScale product this month.

Kioxia XD6 E1.S Datacenter SSD Series: Many cloud service providers (CSPs) and private cloud operators need to utilize the same tools and capabilities of the hyperscale datacenter operators ([Amazon AWS](), [Microsoft Azure](), and [Google Cloud]()) to be competitive. That is one of the reasons why [Facebook]() launched the [Open Compute Platform (OCP)]() initiative. The Kioxia XD6 E1.S PCI NVMe® SSD is built specifically for the CSP/large-scale private cloud environment, with a PCIe® Gen4 interface and a performance profile optimized for CSP workloads, which tend to be read-intensive. The XD6 is optimized for OCP density through its use of the Enterprise Datacenter Small Form Factor (EDSFF) and thermal optimizations. The XD6 also provides highly consistent latencies, improving quality of service profiles, which is critical for CSPs and large-scale private cloud datacenter operators. "Developing and deploying flash-based products is very challenging, and the OCP-based NVMe Cloud SSD Specification helps by aligning SSD providers with hyperscale needs," explains Ross Stenfort, hardware storage engineer, Facebook. "EDSFF E1.S is the next generation of flash form factors, delivering superior thermals, performance, serviceability, and scalability when compared to current solutions. KIOXIA's support of EDSFF is a great step forward and lays the groundwork for the future." The XD6 SSD will be available in 1.92TB and 3.84TB capacities.

Kioxia XG7/XG7-P High-Performance Client SSD: To address needs on the client side, Kioxia also released their XG7/XG7-P series of M.2 SSDs for OEM manufacturers of workstations and laptops. The XG7/XG7-P SSDs are PCIe Gen4 devices with a 4-lance interface and support for NVMe 1.4 and SMBus features. The XG7 is available in 256GB, 512GB, and 1TB capacities, while the XG7-P has a 2TB and 4TB capacity. Both are being sampled to OEMs today, with full-scale launch in 2021.
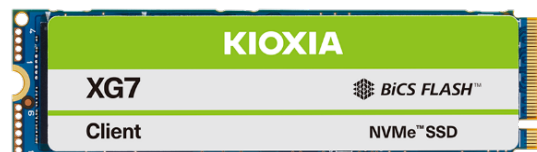
Kioxia KumoScale™ New Feature Release: This week at Kubecon 2020, Kioxia released the latest version of their KumoScale software. The new release is aimed at CSPs, and builds upon the current KumoScale functionality by providing the following capabilities:

KumoScale CSI Driver: The CSI driver is on the official Cloud Native Computing Foundation driver list, and provides Kubernetes containers with virtual volumes that look like local NVMe drives. These virtual volumes are resilient and support live pod migration.

Kubernetes "micro-cluster": This feature containerizes the KumoScale control plane, improving reliability and maintainability.

Multi-Tenancy for virtual clusters: This capability allows a single KumoScale cluster to simultaneously serve multiple client clusters.

It also provides policy-based isolation between tenants, enabling true multi-tenancy.

<u>Hosted Storage Services with Local Volumes</u>: This features frees KumoScale clusters from only providing block storage by allowing storage services such as file systems and object-based solutions to run as worker nodes and serve up local storage instances.
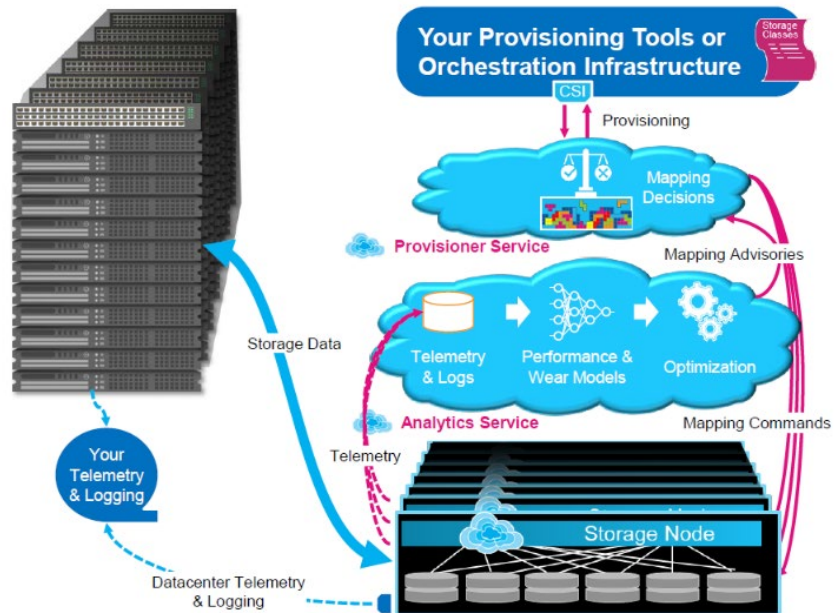
Kioxia has invested in these features to allow service providers such as CSPs, telcos, managed service providers (MSPs), and large private cloud operators to provide services that are competitive with the large hyperscalers, easy to manage through Kubernetes, and provide the highest performance possible.

[Flash Memory Summit](#) featured [Best of Show Awards](#) and [IT Brand Pulse Awards](#).

Most Innovative Flash Memory Customer Implementation - [Pavilion Data Systems](#)

Most Innovative Flash Memory Startup - [NEO Semiconductor](#); [FADU Technology](#)

Most Innovative Flash Memory Consumer Application - [Enmotus](#); [Western Digital](#)

Most Innovative Flash Memory Enterprise Business Application - [Pliops](#)

Most Innovative Hyperscaler Implementation - [Fungible](#)

Most Innovative AI Application- This new category recognizes how a product or service that includes flash memory or other forms of non-volatile memory is being used to solve a specific AI problem including things like machine learning, cognitive computing, big data, IoT, container and virtualized customer environments. Awards Winners: [NVIDIA](#); [IBM](#); [Ambiq](#); [WekaIO](#)

Most Innovative Flash Memory Technology - addresses innovations that will change the way flash memory is used in products and raise the bar to new levels of performance, availability, endurance, scalability and/or energy efficiencies. Award Winners: [Intel](#); [Marvell](#) and [HPE](#); [Pure Storage](#); [VAST Data](#); [KIOXIA](#); [NVM Express®](#); [SNIA® Object Drive Technical Work Group (TWG)](#)

[IT Brand Pulse 2020 Awards](#)

2020/2021 Flash Brand Leaders Voted by IT Pros	MARKET LEADER Voted by IT Pros	PRICE LEADER Voted by IT Pros	PERFORMANCE LEADER Voted by IT Pros	RELIABILITY LEADER Voted by IT Pros	INNOVATION LEADER Voted by IT Pros	SERVICE AND SUPPORT LEADER Voted by IT Pros
SSD	Samsung	Samsung	Samsung	Intel	Intel	Intel
NVDIMM	Intel	Intel	Intel	Intel	Intel	Intel
Computational Storage	NGD	NGD	NGD	NGD	NGD	NGD
All-Flash SAN Array	Dell Technologies	Dell Technologies	Dell Technologies	Dell Technologies	Pure Storage	Dell Technologies
All-Flash NAS Array	Dell Technologies	Dell Technologies	Dell Technologies	Dell Technologies	Dell Technologies	Dell Technologies
Hybrid HDD/SSD Array	Dell Technologies	Dell Technologies	Dell Technologies	Dell Technologies	Dell Technologies	Dell Technologies
On-Prem All-Flash Storage-as-a-Service	HPE	HPE	HPE	HPE	Pure Storage	HPE
Big Memory Software	MemVerge	MemVerge	MemVerge	MemVerge	MemVerge	MemVerge
All-Flash Scale-Out File & Object Storage Systems	Dell Technologies	Dell Technologies	Dell Technologies	Dell Technologies	Pure Storage	Dell Technologies

For the fourth consecutive year, IT Pros selected [Dell](#) as Market Leader for All-Flash SAN Array. Dell was also voted Price, Performance, Reliability, and Service & Support Leader. Dell prevailed over competitive rival NetApp to sweep all six categories of brand leadership for All-Flash NAS Array. Dell was voted Market, Price, Performance, Innovation, and Service & Support leader for All-Flash HDD/SSD Array. Dell also secured IT Pros' votes for Market, Price, Performance, Reliability, and Service & Support Leader in our first year covering All-Flash Scale-Out & File Object Storage Systems.

More 2020 Flash Memory Summit Product Launches

Western Digital - Zoned Namespace and Industrial NVMe SSDs: Western Digital's launch at 2020 Flash Memory Summit (FMS) included the new Ultrastar DC ZN540 enterprise SSD, which includes NVMe Zoned Namespaces (ZNS), which allows WDC to reduce the amount of DRAM required in the drive, reducing SSD cost. WDC also announced the Zoned Storage Initiative, a new form of storage architecture to support the zettabyte-scale storage needs fo the future. WDC also launched the industrially-rated IX SN530 M.2 SSD, which is targeted for automotive applications and is available in 1TB and 2TB capacities.
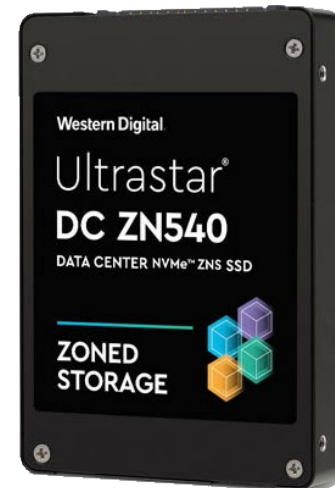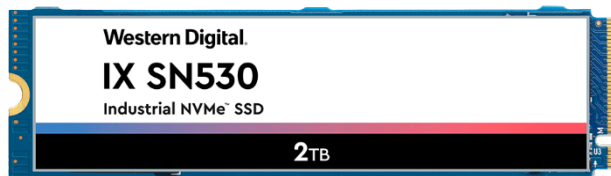
Xilinx and Samsung - SmartSSD Computational Storage Drive: Roughly two years ago, Samsung and Xilinx announced a partnership to build a computational storage device that combined Samsung SSD and Xilinx FPGA technology in a single package. That product was launched last week at FMS in the form of a 4TB U.2 drive.

The product combines the capabilities of Samsung's PCIe Gen3 SSD, the Xilinx Kintex FPGA, and 4GB of DDR4 DRAM specifically for use by the FPGA workload. The Samsung SmartSSD CSD has completed customer qualifications, and is now in general availability.

FADU Delta GEN4 SSDs: FMS 2020 also saw the launch of the FADU Delta SSDs. These SSDs, which include four E.1S EDSFF form factors and a U.2 drive, are all NVMe 1.4a and

PCIe Gen4 compatible drives, with capacities up to 16TB today, and a 32TB U.2 drive on the way in the near future. FADU also launched their FC4121 SSD Controller, which forms the heart of the FADU Delta SSDs.

NGD Systems Launches ESDFF E1.S NVMe Computational Storage SSD: NGD Systems also launched and EDSFF computational storage drive (CSD), in this case using the E.1S form factor. The drive supports 12TB today, and will be available with 16TB in Q1 2021. It comes with both 15mm and 25mm heatsinks, and is optimized for use in both 1U and OCP servers. NGD Systems has partnered with AIC as the launch partner for this device.

Micron Launches 176-Layer NAND: Not all of the product announcements at FMS 2020 were systems. Micron used FMS 2020 to launch their 176-layer NAND flash device. The device increases both the density and capacity of flash devices, as well as boosting the read/write performance of the drives by 30%-35%. Micron expects to productize this technology in its upcoming SSDs.

"As we see 2020 continue to create unique and innovative ways to engage customers and attend events, it is great to see the progress continue in storage technologies. With product releases from most NAND Vendors, sales of entire business units, the growth of Computational Storage solutions, ZNS, as well as, the birth of the DPU, much more is to come." Scott Shadley, SNIA Board Member and VP of Marketing at NGD Systems.

"Flash Memory Summit, celebrating a 15th anniversary virtually, with a successful gathering of companies, like Western Digital talking about Computational Storage and ZNS, prove that the desire to stay informed is even more key, and storage technologies are going to drive that effort. We have even seen organizations like SNIA and NVMe coming together on new technologies, with focus this year on ZNS, Computational Storage, and more, shows how quickly the technology world moves forward, even during a pandemic. 2021 is going to continue to show large trend changes in our technology arena."

WekaIO's Barbara Murphy Wins 2020 SuperWomen in Flash Leadership Award at FMS 2020

And, the 2020 SuperWomen in Flash Leadership Award goes to Barbara Murphy, Vice President of Marketing at WekaIO. For the past several years, FMS has recognized women who have made significant contributions to the storage industry. This year, the winner is Barbara Murphy, Vice-President of Marketing at Weka. Barbara has had a long career in the storage industry, including Adaptec, 3ware, AMCC, Panasas, and HGST. "I have always thrived in the fast-paced work environment of high-technology companies," said Barbara. "I have especially enjoyed developing integrated go-to-market strategies for startups and have focused on building cohesive teams based on a spirit of mutual respect, tactical excellence, open communication, and a fun work environment." Barbara's contributions have helped Weka become one of the fastest-growing storage companies in the past several years. Congratulations Barbara!

Flash Memory Summit Highlights Technological Evolution in Computing for Artificial Intelligence

While Flash Memory Summit 2020 is predominantly storage-centric, it also explores technologies that drive storage architectures and practices. Three examples of this that were covered at FMS 2020 that fell into this category include artificial intelligence (AI), general-purpose graphics processing units (GPUs), field-programmable gate arrays (FPGAs), application-specific integrated circuits (ASICs), data processing units (DPUs), and the impact of NVMe-oF on linking these various pieces together. The panel included Dave Eggleston (Principal, Intuitive Cognition Consulting), Rob Davis (VP of Storage Technology at NVIDIA), Eric Herzog (VP of WW Storage Channels at IBM), Tom Coughlin (President of Coughlin Associates), and Jim Handy (director/chief analyst at Objective Analysis). Some of the conclusions that the panel discussed included:

- It will be necessary to rethink computer architectures to build AI systems that are both high-performance and power-efficient. This includes moving some compute tasks out of the CPU and placing them inside GPUs, network controllers, storage controller, and storage devices.
- Technologies like NVIDIA's GPUDirect that allow the host CPU to be bypassed during data movement are critical to improving AI system performance. Perhaps we will see other system components utilize these RDMA-based technologies to avoid CPU copy operations.
- Non-volatile RAM (NVRAM), embodied in Intel's Optane SSDs and DIMMs, are still alive and well, despite making slower progress than originally expected. These devices, which Intel has invested billions of dollars into during the past decade, can both accelerate system performance and reduce system cost by reducing the amount of DRAM required.

All of these developments are part of the trend towards disaggregation of computing, especially as new devices pick up and accelerate AI workloads.

G2M Research Multi-Vendor Webinar Series

Our 2021 webinar schedule is ready! Click on any of the topics to get more information about that specific webinar. Interested in Sponsoring a webinar? Contact **G2M** for a prospectus.

Our October webinar "AI, GPUs, & Storage Use Cases in Healthcare" was sponsored by Kioxia (Matt Hallberg), NVIDIA (Brad Genereaux), WekaIO (Shimon Ben-David) and Datyra (Keith Klarer). View the recording and/or download a PDF of the slides.

G2M
RESEARCH

Nov 17:   Implementing NVME™ & NVMe-oF™ for Cloud Service Providers

2021 Webinars

Jan 19:   Can Your Server Handle The Size of Your SSDs?

Feb 23:   Storage Architectures to Maximize the Performance of HPC Clusters

March 23:   One Year after COVID-19: How Did Storage Architectures Perform for Biotech AI Modeling & What Can We Learn From This?

April 20:   The Race to be Relevant in Autonomous Vehicle Data Storage   (both On-Vehicle and Off-Vehicle)

May 18:   Responsive and Efficient Storage Architectures for Social Media

Effective Marketing & Communications with Quantifiable Results