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TECHNOLOGY CORP.

EDSFF – A Flash Optimized Form-Factor

The introduction of flash in the datacenter first came in legacy form factors. The new storage media increased efficiency but lacked optimizations to scale. The chains of the past acted like an anchor when the mantra was scale-up, scale-out. For an industry reliant on change, some things take time to evolve. 3.5" and 2.5" hard drive form factors have been the standard for so long few people even remember the 5.25" predecessor.

The process of optimizing storage for the next twenty years goes beyond the form factor. Several companies and industry bodies came together to design a new platform. The all-encompassing redesign required a fresh look to overcome difficult challenges at every turn. The payoff will reshape the server, the rack, and the datacenter for decades to come.

The Future - Today



BigTwin™ E1.S



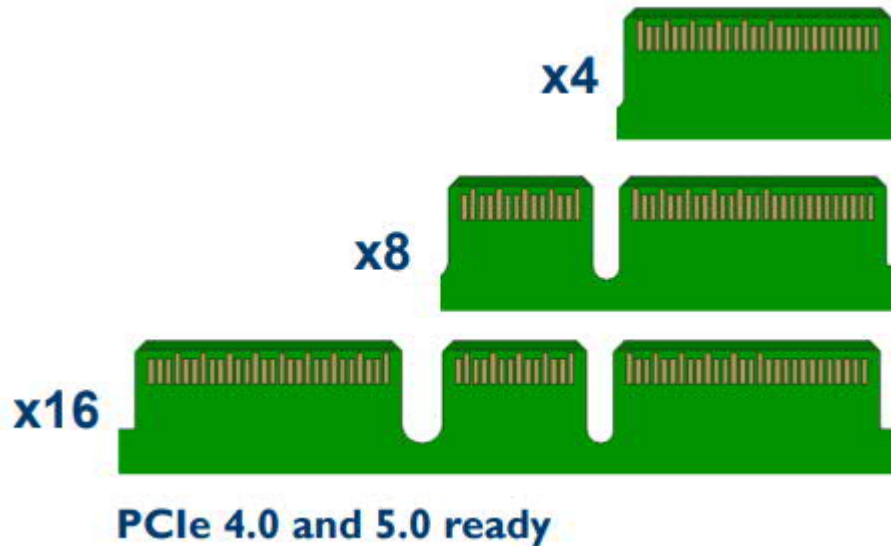
1U Petascale E1.S



1U Petascale E1.L

The new EDSFF (Enterprise and Datacenter Small Form Factor) solutions will make storage architects rock stars within an organization. The platform design increases operational and thermal efficiency while optimizing density. The all-flash design uses the NVMe protocol for 6x increases in throughput and a 7x reduction in latency. Streamlined component design reduces the airflow required for operation by up to 55% over existing storage servers. This decreases operational costs by leveraging better IOPS per Watt. Upon disposal, the loss of legacy components like HBAs also reduce the amount of e-waste.

Fast, Faster, Fastest – 3 Connectors with an Eye on the Future

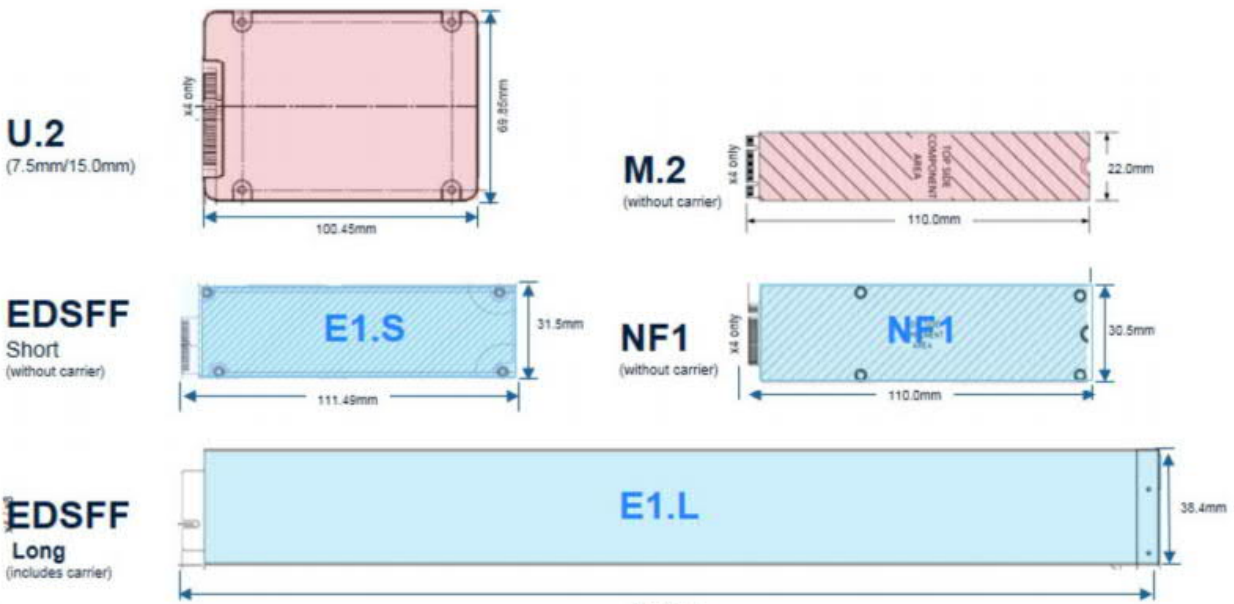


Not every storage tier needs to provide the same level of performance. The new EDSFF standard includes three edge connectors to scale performance. This allows companies to build products based on customer's requirements by directing PCI Express lanes to different areas of the server (GPUs, network, storage). This is also a cost saving feature that allows builders to use processors with fewer PCI Express lanes in less expensive models.

The EDSFF edge connector is a zero-force type that allows hot plug ability for simply rip and replace capabilities not offered in early NVMe add-in card or M.2 designs.

The same edge connectors also work for future technology advances to increase throughput at the device level. Emerging PCIe 4.0, and its eventual successor PCIe 5.0, provides a clear upgrade path as old systems age out and new servers take their place. Over time, we will also see EDSFF migrate into the downstream markets. Workstations and other edge computing systems that already utilize hot swap bays will adapt EDSFF storage.

The Short List of Long Lengths



White box server providers have already adapted both EDSFF form factors, E1.S and E1.L.

E1.S focuses on optimizations for thermal, power and scalability. This form factor provides up to 12 standard pads for NAND packages with ample room for other surface mount components like controllers and DRAM packages. The 111.5mm length supports up to 12 watts per drive.

E1.L is the long form factor designed for superior capacity for disaggregate servers. The increased length boosts power support for up to 40 watts per drive and 48 flash package pads. The 318.75mm long drives already scale to one petabyte per unit of rack space and we could see that double in record breaking time.

Neither E1.S nor E1.L requires a drive sled or the tedious task of using four screws per device. This allows for faster deployment, less billable hours, and instant replacements when seconds matter.

The Takeaway – Years in the Making for Many Dollars of Saving

The EDSFF standard has combined the best of many smaller advancements since the start of the SSD-era and put them under a single umbrella with a focus on interoperability. The design increases performance, capacity, and power efficiencies on scales we haven't seen before. In time, we will see EDSFF become the standard in enterprise and datacenters deployments on a global scale. In the years to come, the standard will move downstream to other markets where data hungry CPUs require fast, large-volume storage for massive datasets.

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