OpenFlex™ Data24 Series NVMe-oF™ Storage Platform

The Performance of NVMe™ Flash in Shared Storage, now with TCP support

Western Digital's OpenFlex Data24 3200 series NVMe-oF storage platform extends the high performance of NVMe flash to shared storage. Similar to the original OpenFlex Data24, It provides low-latency sharing of NVMe SSDs over a high-performance Ethernet fabric to deliver similar performance to locally attached NVMe SSDs. Unsurpassed connectivity in its class using Western Digital RapidFlex™ NVMe-oF controllers, allows up to six hosts to be attached without a switch, like a traditional JBOF.

OpenFlex Data24 3200 series uses Western Digital's RapidFlex C2000 Fabric Bridge Adapters to provide 2, 4, or 6-ports of 100GbE which can now connect to RDMA and/or TCP configured host ports. While RoCE (RDMA over Converged Ethernet) connections have historically been preferred in data centers, TCP offers greater ease-of-use and is sometimes preferred. OpenFlex Data24 3200 series offers the flexibility of connecting to either RoCE or TCP host ports for optimum usage.

NVMe-over-Fabrics, or NVMe-oF, is a networked storage protocol that allows storage to be disaggregated from compute to make that storage widely available to multiple applications and servers. By enabling applications to share a common pool of storage capacity, data can be easily shared between applications or needed capacity can be allocated to an application to respond to application needs.

OpenFlex Data24 3200 series NVMe-oF storage platform can also be used as a disaggregated storage resource in an open composable infrastructure environment using the Open Composable API. The platform can also be specified with just two RapidFlex adapters for simpler environments and as a direct replacement for SAS external storage.

OpenFlex Data24 3200 series is built to deliver high availability and enterprise-class reliability. The entire platform, including SSDs, is backed with a 5-year limited warranty.

Features

- Up to 368TB[1] of low latency Dual Port SSDs in 2U 24-bay platform
- RDMA over Converged Ethernet (RoCE) or Transmission Control Protocol (TCP) connectivity
- Bandwidth match between SSDs (Storage) and I/O (Network) – No oversubscription
- RESTful API support for simplified management
- Vertically integrated Western Digital design: NVMe SSDs, fabric adapters and platform
- Optional dual adapter configuration for direct SAS replacement
- Industry-leading 5-year limited warranty

Benefits

- Enables multiple servers to share NVMe flash storage as if it were local
- Leverages low latency fabric to fully utilize IOPS and capacity
- Provides more efficient use of large capacity SSDs at low latency
- Balances access to eliminate over-subscription and maintain NVMe performance
- Provides open composability thru mature NVMe-oF standard
- Ideal SAS replacement option (dual adapter configuration)

OpenFlex Data24 Series NVMe-oF Storage Platform

Specifications

Hardware

24 Dual port high-performance SSDs

Wide range of NVMe SSD capacity and endurance options

    —Ultrastar® DC SN840: 1DWPD: Up to 15360 GB

    —Ultrastar DC SN840: 3DWPD: Up to 6400 GB

High availability with dual IOM

3 PCIe® x 16 slots/IOM

Western Digital RapidFlex NVMe-oF fabric adapters

    —Six 100GbE ports with dual IOM for maximum performance

    —Four ports for a balance of performance and price

    —Two 100GbE ports for direct replacement of SAS external storage

Western Digital RapidFlex C2000 NVMe-oF Fabric Bridge Adapters

OpenFlex inspired composability in a mainstream 2U24

28in (711mm) chassis depth - fits most commonly used short depth racks (800 - 1000mm)

Specifications	OpenFlex Data24 Series
Form Factor	2U
Front Drive Bays	Up to 24 x U.2 NVMe SSDs
Power Supply	2x 2000W Platinum 200-240VAC, CRPS, Hot Plug
Fabric Adapter Slots	6x PCIe x16
Fabric Adapter(s)	Western Digital RapidFlex C2000 NVMe-oF Fabric Adapter
Cabling	Passive (1 - 5m) and Active Optical (5m)
Platform Management	ARM Based BMC
Rear I/O	1G-BASE-T Management Port (RJ-45)
HA Redundancy	Dual IOMs, Dual Port SSDs, Dual PSUs, Dual Rotor Hot Plug Fans
Environmental	10°C - 35°C
Chassis Dimensions (Height x Width x Depth)	87.63mm x 448mm x 711.2mm 3.45in x 17.64in x 28in
Weight	Maximum 31.75kg / 70lbs
Warranty[2]	5 Years Limited Warranty

Performance for Data24

RoCE		128K Bandwidth	4K IOPS	4K QD1 Latency
6 x 100GbE	Read	71.47 GB/s	16.76 M	83.6 µs
	Write	66.52 GB/s	6.16 M	27.8 µs
4 x 100GbE	Read	47.65 GB/s	11.17 M	83.6 µs
	Write	48.01 GB/s	6.13 M	27.9 µs
2 x 100GbE	Read	21.87 GB/s	4.01 M	83.9 µs
	Write	24.00 GB/s	5.65 M	28.3 µs

TCP		128K Bandwidth	4K IOPS	4K QD1 Latency
6 x 100GbE	Read	63.87 GB/s	10.68 M	92.2 µs
	Write	62.52 GB/s	6.16 M	54.2 µs
4 x 100GbE	Read	44.08 GB/s	8.00 M	92.5 µs
	Write	44.83 GB/s	4.16 M	64.3 µs
2 x 100GbE	Read	21.41 GB/s	2.94 M	93.2 µs
	Write	23.69 GB/s	1.92M	65.9 µs

Target Capabilities

- Up to 120 virtual controllers, allowing 120 hosts to share the NVMe device
- Up to 3896 NVMe-oF Submission / Completion queues
- Up to 64 entries per NVMe-oF connection (depends on selected profile)
- Up to 32 NVMe SSDs
- Up to 32 Namespaces per SSD
- Supports metadata pass-through
- Supports ZNS drives
- Supports 512 and 4096-byte logical block sizes
- Supports 8- & 16-byte metadata for 512B blocks; supports 8-, 16-, 64-, and 128-byte metadata for 4096B blocks

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