Western Digital.

PRODUCT BRIEF

Features

- Composable, shareable high-performance storage
- Access data from anywhere in the data center
- Lower Capex and Opex by reducing resource over provisioning
- Manageable through existing data center orchestration frameworks
- Reduce stranded or underutilized resources
- Dynamic provisioning—scale down resources just as easily as you scale up
- Common hardware for varied use cases
- Scale at the enclosure or device level
- Deploy uniform components and provision as needed

OpenFlex™ F3100 Series Fabric Device

Modular Building Block for Open, Composable IT Infrastructure

With the exponential growth in data, along with the increasing diversity of workflows and demands on IT infrastructure, businesses need to increase speed, agility, and time-to-value for their customers. Emerging as a solution for this, composable infrastructure is a new architectural approach that—using NVMe™-over-Fabrics—will vastly improve compute and storage utilization, performance, and agility in the data center. OpenFlex is based on scale-out performance and open composability.

Enabling Fast Data to Live Outside the Server

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.

Exploiting NVMe device-level performance, NVMe-oF promises to deliver the lowest end-to-end latency from application to shared storage. NVMe-oF enables composable infrastructures to deliver the data locality benefits of NVMe DAS (low latency, high performance) while providing the agility and flexibility of sharing storage and compute. OpenFlex's scale-out performance is particularly useful for large analytics tasks, large-scale high performance computing and other demanding workloads.

Multiple Storage Tiers Over the Same Wire—Disk and Flash Accessed via NVMe-oF

In addition to enabling NAND flash media access using NVMe-oF, OpenFlex also enables disk and other IT components such as GPUs, FPGAs and even tape to be accessed via NVMe-of so that all data center storage can be addressed in the same way. The Western Digital NVMe-oF architecture is a huge step towards the software-defined data center—allowing storage to be assigned to applications without regard for where it is physically located. This is the essence of "composable infrastructure" where physical resources (compute, networking, storage) can be logically and dynamically configured and treated as a resource for a specific application without the need for physical configuration.

Western Digital has established the Open Composable Compatibility Lab (OCCL). The OCCL is where different vendors can come together to test and verify their Open architecture. The OCCL underscores Western Digital's commitment to having a dynamic community of technologies supporting composable disaggregated infrastructure (CDI), which is an important step in providing the flexibility needed to keep up with the rapid rate of change in today's business environment.

OpenFlex™ F3100 Series Fabric Device

PRODUCT BRIEF

Specifications

OpenFlex F3100 Fabric Device

Protocol	Ethernet					
Media	NAND Flash					
Ports	Dual QSFP28 (2×50Gb)					
Power	140 W					
Endurance	0.8 DWPD			2 DWPD		
Formatted Capacity (TB)[1]	15.4	30.7	61.4	12.8	25.6	51.2

OpenFlex E3000 Fabric Enclosure with up to 10 OpenFlex F3100 Series Fabric Devices

Max. # of Devices	• 10 Dual-port fabric device bays
Weight	• Product fully populated: 68.5kg (151.0 lbs)
Fabric/Network Interface	• Dual QSFP28 per Device
Management	• RJ45 1Gbps connector • Open Composability API (out of band via RJ45)[2]
LED Indicators	• Power/Activity, Locate and Fault
Physical Dimensions	• Height 131mm (5.16") • Width 447mm (17.61") • Depth 828mm (32.60")
Power	• 220V • Dual 1600W Power Supplies with fans
Cooling	• 4 Fans (N+1 Supported)
Environmental	• Operating Temperature: 5°- 40°C • Non-op Temperature: -30°- 60°C • Humidity: 8% to 90% RH operating & non-op
Serviceability	• Hot-swappable power supplies, fans, and fabric devices

CRU P/N	1EX2413	1EX2414	1EX2415	1EX2416	1EX2417	1EX2418
Capacity / Endurance	25.6TB 2DWPD	51.2TB 2DWPD	15.4TB 0.8DWPD	15.4TB 0.8DWPD	30.7TB 0.8DWPD	61.4TB 0.8DWPD
Random Read[3] (4kB, QD=1024)	2199K IOPS	2164K IOPS	2176K IOPS	2111K IOPS	2160K IOPS	2191K IOPS
Random Write (4kB, QD=1024)	1493K IOPS	1431K IOPS	1464K IOPS	1433K IOPS	1397K IOPS	1400K IOPS
Random 70R/30W (4kB, QD=1024)	2199K IOPS	2183K IOPS	2227K IOPS	2137K IOPS	2188K IOPS	2251K IOPS
Sequential Read (128KB, QD=320)	11.8 GB/s	11.7 GB/s	11.7 GB/s	11.7 GB/s	11.7 GB/s	11.7 GB/s
Sequential Write (128KB, QD=320)	9.9 GB/s	9.9 GB/s	9.4 GB/s	9.9 GB/s	9.4 GB/s	9.9 GB/s
Random Write Latency (4KB, QD=1, 99.99%)	33.9 µs	33.7 µs	33.7 µs	33.7 µs	33.9 µs	33.5 µs

[1] One MB is equal to one million bytes, one GB is equal to one billion bytes and one TB equals 1,000GB (one trillion bytes). Actual user capacity may be less due to operating environment.

[2] For more information on Open Composability, visit: www.opencomposable.com. For more information on the OpenFlex Architecture, visit: www.wdc.com/nvmf.

[3] Based on internal testing. Latency measured through a single Mellanox® SN2700 switch. One K IOPS is equal to 1000 IOPS. Devices pre-conditioned with 2 full sequential fills. Performance may vary with changes in useable capacity and workload. Consult product manual for further details. All performance measurements are in full sustained mode and are peak values. Subject to change.

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