

## QSAN XCUBESAN XS3226D

QSAN Technology has a fine reputation in the enterprise storage market as its extensive range of arrays offer extreme value with no compromises on features. The latest XCubeSAN XS3200 series takes this to the next level by delivering high-performance all-Flash storage at a price Tier-1 vendors can't hope to compete with.

On review is the XCubeSAN XS3226D which scores even more points as its 2U chassis has 26 SFF drive bays - two more than most other competitors. Hardware redundancy looks good as along with two hot-plug fans and PSUs, the dual controllers run in active/active mode and support optional cache-to-flash backup modules.

Each controller has a fast quad-core Xeon D-1500 series processor teamed up with 4GB of DDR4 cache memory field expandable to 64GB. Each controller comes with dual embedded 10GBase-T iSCSI data ports and has room for two host expansion modules.

QSAN offers a good range of host cards with quad-port 16Gbps FC, 10GbE SFP+ and Gigabit on the menu. Note that the second slot has a maximum bandwidth of 20Gbps so only supports the 10GbE and Gigabit host cards.

The controllers are endowed with 12Gbps SAS3 backplanes and these services extend to their dual mini-SAS expansion ports. QSAN's XD5300 series of disk shelves can be connected to the head unit over dual-redundant links with the XS3226D supporting up to 10 shelves and 286 drives.

For testing, we loaded up 26 400GB Micron SAS3 SSDs. We had no problems deploying



the array in the lab as QSAN's QFinder located it for us and provided direct access to its web interface.

The new SANOS 4 web interface provides easy access to all features. Storage is provisioned by placing selected drives into pools and choosing from eleven RAID array options. During pool creation, you can choose thick or thin provisioning and set the preferred controller. Volume creation is just as easy as you pick a pool, decide on a size and set it for data storage or as a backup target for the integral cloning and replication operations.

Volumes are protected with snapshots which run on-demand or regularly at scheduled intervals. Existing snapshots can be exposed as new read-only or read/write targets and assigned to specific hosts using the handy auto-map feature.

For performance testing, we used four Xeon E5-2600 v4 rack servers equipped with QLogic dual-port 16Gbps FC adapters and running Windows Server 2012 R2. We configured two RAID10 pools with two volumes each and mapped them to all ports on both controllers to create high-speed 32Gbps MPIO server links.

Running Iometer on one server returned fast sequential raw read speeds of 3,132MB/sec and a cumulative total for all four of

11,851MB/sec - very close to QSAN's claimed 12,000MB/sec. For write speeds, we saw a cumulative 6,839MB/sec across all four servers - shy of the claimed 8,000MB/sec but impressive nonetheless. The all-Flash array shone in our random read and write tests as Iometer reported only slightly lower speeds than those of our sequential tests.

I/O throughput is also excellent with one server hitting nearly 400,000 IOPS for sequential read operations using a 4KB block size (note also all these figures were achieved under snapshot conditions).

Failover is transparent and near-instant as after pulling the secondary controller out to simulate a failure, our Iometer tests continued unabated with uninterrupted access to all volumes. Full redundancy was established less than 20 seconds after we plugged the controller back in and we saw Iometer throughput return to full MPIO speeds after a few minutes.

**Product:** XCubeSAN XS3226D

**Supplier:** QSAN Technology

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**Price:** XCubeSAN XS3226D, 2U 26, Dual, 2x 10Gb/s RJ45 Onboard £6,399 ex VAT  
**Extras:** Host Cards (x2) - 4 port, 16Gb/s FC (£1,299) or 4 port, 10Gb/s iSCSI (£699)

**VERDICT:** QSAN's affordable XCubeSAN XS3226D will have Tier-1 storage vendors very worried. It delivers high levels of redundancy along with seamless failover and makes high-performing all-Flash arrays a reality for SMBs.