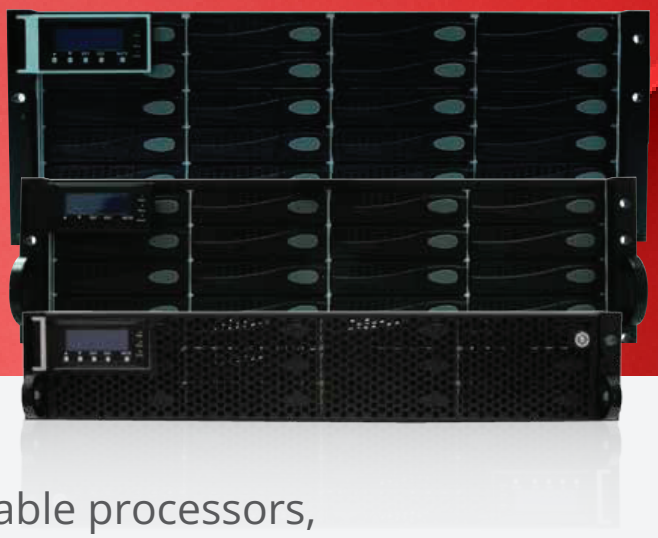
For enterprise and SMB businesses, Tyrone Opslag Unified Block Series is the perfect choice for a highly reliable, scalable and affordable SAN storage system.



# TYRONE OPSLAG D3-QFA-326D

## Dual active design architecture, 6-core scalable processors, 16GB DDR4 RDIMM (Max 384GB)

**Tyrone OPSLAG D3-QFA-326D** is another high-performance storage product in the OPSLAG unified block series. It is among the finest all-flash array data storage at the entry-level. Irrespective of enterprise size, its agility, and performance, ensure that even the most demanding application requirements are met successfully. It delivers excellent storage performance, enterprise-level reliability, and a flexible-to-use management system. The storage perfectly aligns with the objective of modern enterprise applications such as integrated virtualization, AI/ML, HPC, and financial services. Some of the noteworthy benefits are listed below:

**All NVMe Flash Storage:** It is 100% native high-density flash storage. Because of this, it can deliver the performance requirements of high-performance computing infrastructure with an impeccable IOPS at µs-level latency.

**Enterprise-Grade Performance:** The product is flexible with a high-speed 25GbE/32Gb iSCSI/Fibre Channel (FC) I/O host card. Moreover, it boasts excellent IOPs with ultra-low latency, i.e., 450Krandom write IOPs @ 500µs latency and 220K random write IOPs @ 300µs latency.

**Highly Reliable:** It has a remarkable 99.9999% high availability design without any point of failure. The cache-to-flash memory protection solution ensures that you never lose your valuable data.

**Simple to Use:** With Tyrone OPSLAG D3-QFA-326D, it is easy to upgrade and substitute system components with modular hardware design.

**Cost-Effective:** You can expect a significant saving to TCO (Total Cost of Ownership) compared to industry-leading flash storage.

**Tyrone Life:** It will provide a perceptible SSD monitoring with cent percent accuracy of SSD utilization ratio.

## PRODUCT HIGHLIGHTS

- Dual-Controller (active-active) Unified Storage Array
- Host Interface: Default: 2 x 10G (SFP+) iSCSI ports, 1 x Management port
- Supports RAID 0,1,0+1,3,5,6,30,50 & 60 with 16GB cache upgradable to 384GB
- Supports up to 26 hot-swap NVMe SSD with support of 399 TB
- Populated with 12 x 7600GB NVMe, hot-plug SSDs (1 DWPD)
- Fault-tolerant and redundant modular components for SAN controller, PSU, FAN module, and dual port disk drive interface
- Multipath I/O and load balancing support (MPIO, MC/S, Trunking, and LACP)
- Instant RAID volume availability
- Online storage pool expansion, volume extension & volume migration
- Online RAID level migration
- Supports thin provisioning
- Built-in Snapshot with rollback (64 per volume, 4096 per system)
- Volume cloning feature for local replication
- Synchronous, block-level, replication available, always synchronize based on the recorded fracture log
- Integration with Windows VSS
- Supports Wake-on-LAN
- Six-Core Xeon Processor
- N+1 Redundant power supplies (2 x 800W, 80Plus Platinum)
- Web UI for setup and configuration (HTTPS secured web & SSH secure shell)
- USB LCM, Dedicated LAN port & console port for management
- 3U form factor [438.0 x 645.0 x 132 mm (W x D x H)]
- Field upgradable firmware (online firmware update)

## SPECIFICATIONS

Tyrone® opslag™

### PERFORMANCE SERIES

Opslag Unified Block Performance Series brings enterprise-level features such as thin provisioning, SSD read and write cache, auto tiering and snapshot to the SMB businesses.

| MODEL NAME | D3-QFA-326D |
|---|---|
| Form Factor | • 3U form factor |
| Raid Controller | • Supports RAID 0, 1, 0+1, 3, 5, 6, 30, 50 & 60 with 16GB cache upgradable to 384GB |
| Processor | • Six-Core Xeon Processor |
| Memory (Per Controller) | • 16GB DDR4 ECC RDIMM |
| Host Connectivity (Per Controller) | • 2 x 32Gb or 4 x 16Gb or 2 x 16Gb Fibre-channel ports<br>• 2 x 25Gb (SFP28) or 4 x 10Gb (SFP+) iSCSI ports<br>• 2 x 10Gb (RJ45) iSCSI ports<br>• 4 x 1000BaseT iSCSI ports |
| Expansion Connectivity | |
| Drive Type | • Fault-tolerant and redundant modular components for SAN controller, PSU, FAN module, and dual port disk drive interface |
| Expansion Capabilities | • Online storage pool expansion, volume extension & volume migration |
| Max. Drives Supported | • Supports up to 26 hot-swap NVMe SSD with support of 399 TB |
| Dimension (HxWxD) | • 438.0 x 645.0 x 132 mm (W x D x H) |
| Memory Protection | • Battery Backup Module + Flash Module |
| LCM | • USB LCM, Dedicated LAN port & console port for managemen |
| Power Supply | • N+1 Redundant power supplies (2 x 800W, 80Plus Platinum) |

# SOFTWARE

Tyrone® opslag™

## Operating System
- 64bit embedded Linux

## Storage Management
- RAID level 0 ,1 ,0+1 ,3 ,5 ,6 ,10 ,30 ,50, 60, and N-way mirror
- Flexible storage pool ownership
- SSD Cache
- Auto Tiering
- Global, local, and dedicated hot spares
- Write-through and write-back cache policy
- Online disk roaming
- Spreading RAID disk drives across enclosures
- Background I/O priority setting
- Instant RAID volume availability
- Fast RAID rebuild
- Online storage pool expansion
- Online volume extension
- Online volume migration
- Auto volume rebuilding
- Instant volume restoration
- Online RAID level migration
- SED drive support
- Video editing mode for enhanced performance
- Disk drive health check and S.M.A.R.T attributes
- Storage pool parity check and media scan for disk scrubbing
- SSD wear lifetime indicator
- Disk drive firmware batch update

## iSCSI Host Connectivity
- Proven QSOE 2.0 optimization engine
- CHAP authentication
- SCSI-3 PR (Persistent Reservation for I/O fencing) support
- iSNS support
- VLAN (Virtual LAN) support
- Jumbo frame (9,000 bytes) support
- Up to 256 iSCSI targets
- Up to 512 hosts per controller
- Up to 1,024 sessions per controller

## Fibre Channel Host Connectivity
- Proven QSOE 2.0 optimization engine
- FCP-2 & FCP-3 support
- Auto detect link speed and topology
- Topology supports point-to-point12 and loop
- Up to 256 hosts per controller

## High Availability
- Dual-Active (Active/Active) SAN controllers
- Cache mirroring through NTB bus
- ALUA support
- Management port seamless failover
- Fault-tolerant and redundant modular components for SAN control-ler, PSU,
- FAN module, and dual port disk drive interface
- Dual-ported HDD tray connector
- Multipath I/O and load balancing support (MPIO, MC/S, Trunking, and LACP)
- Firmware update with zero system downtime
- Security
- Secured Web (HTTPS), SSH (Secure Shell)
- iSCSI Force Field to protect from mutant network attack
- iSCSI CHAP authentication
- SED drive support

## Storage Efficiency
- Thin Provisioning with space recla-mation
- Auto Tiering with 3 levels of storage tiers

## Networking
- DHCP, Static IP, NTP, Trunking, LACP, VLAN, Jumbo frame (up to 9,000 bytes)

## Advanced Data Protection
- Snapshot, block-level, differential backup
- Writeable snapshot support
- Manual or schedule tasks
- Up to 64 snapshots per volume
- Up to 64 volumes for snapshot
- Up to 4,096 snapshots per system
- Remote Replication
- Asynchronous, block-level, differential backup based on snapshot technology
- Traffic shaping for dynamic band-width controller
- Manual or schedule tasks
- Auto rollback to previous version if current replication fails
- Up to 32 schedule tasks per controller
- Volume clone for local replication
- Configurable N-way mirroring
- Integration with Windows VSS (Volume Shadow Copy Service)
- Instant volume restoration
- Cache-to-Flash memory protection10
- M.2 flash module
- Power module: BBM or SCM (Super Capacitor Module)
- USB and network UPS support with SNMP management

## Virtualization Certification
- Server Virtualization & Clustering
- VMware VAAI for iSCSI & FC
- Microsoft ODX

## Easy Management
- USB LCM, serial console support, online firmware update
- Intuitive Web management UI, secured web (HTTPS), SSH (Secured Shell), LED indicators
- S.E.S. support, S.M.A.R.T. support, Wake-on-LAN, and Wake-on-SAS Green & Energy Efficiency
- 80 PLUS Platinum power supply
- Wake-on-LAN to turn on or wake up the system only when necessary
- Auto disk spin-down

## Host Operating Systems Support
- Windows Server 2008, 2008 R2, 2012, 2012 R2, 2016
- SLES 10, 11, 12
- RHEL 5, 6, 7
- CentOS 6, 7
- Solaris 10, 11
- FreeBSD 9, 10
- Mac OS X 10.11 or later

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## Let's Talk

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