



Titan T5000/T5000x

Unified storage built for
a multi-cloud world



Titan T5000 is built for multi-cloud deployment, it provides simple and affordable unified storage that is designed for performance, delivering high-speed access to business data with the ability to simultaneously run mixed application workloads, process inline data reduction, (all-flash pools) and provide data services with no impact on performance.

Key Benefits

- **Modern**
2U design future proofs your investment; scalable to 1500 drives and 16PB raw capacity
- **All-inclusive**
Every Titan T5000 comes to you with all-inclusive software making your investment easy to purchase and own
- **Simple**
Install and configure in 25 minutes, with intuitive easy-to-use web based (HTML5) management
- **Flexible**
Deploy as a physical appliance or as part of a converged infrastructure – all sharing one OS and GUI
- **Multi-cloud**
Titan T5000 supports multiple cloud deployment options that help simplify operations, lower costs and reduce complexity

Designed for price-performance

Titan T5000 storage system has the raw performance to ensure that controllers don't become the limiting factor, enabling users to scale as needed to keep pace with application IOPS, latency and capacity growth and are designed for 5-9's availability. Titan T5000 array IO is accelerated with FAST Cache to deliver the performance of flash with lower-priced MLC flash drives.

Optimized for efficiency

This unified storage system enables organizations to deal with the pressing issues of data growth and data center sprawl, leveraging the latest storage technologies to drive digital transformation with unified consolidation and superior all-inclusive data services functionality. Also, unlike some competitive systems, Titan T5000 is an active-dual controller architecture that ensures data access with 5-9's availability.

Lower capex/opex – Entire racks of legacy systems can be replaced by only a few rack units of Titan T5000 hybrid storage, freeing up data center resources, and dramatically reducing co-lo costs, power and cabling needs.

Consolidate applications – If you have several demanding environments, such as databases and transactional processing, T5000 systems are the easy way to consolidate them to save space and cost, while improving performance, efficiency and response time.

Data migration – Even if you've been using 3rd party storage systems, migrating data to Titan T5000 couldn't be simpler. The system provides you with built-in and best practice data migration capabilities for file and block data making your transition seamless. File migration from NetApp and VNX is also available through Cloud Tiering Appliance.

Expanded file capabilities – Titan T5000's integrated block and file design supports a 64-bit file system and adds features like file system shrink and reclaim that improves utilization and flexibility, use of Top Talkers or file correlated stats and full sync/async file replication capabilities with Metrosync file failover management.

Built for multi-cloud

Customers nowadays demand their storage infrastructure be cloud ready. Titan T5000 is built for a multi-cloud world, so you can easily leverage this platform with flexible cloud deployment options:

- Validated for use with VMware Cloud Foundation (VCF) enabling you to build your own hybrid cloud on VCF with NFS and best of breed components to easily provision storage
- Expand to the cloud with an automated policy-based virtual appliance for file tiering and block snapshot archiving to four S3-based clouds freeing up valuable capacity and reducing backup windows.

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Data protection

Enterprise data protection solutions deliver the resilience and availability to protect your organization from data and application outages or worse. Titan T5000 takes the financial pain out of availability and disaster recovery deployment by including a complete suite of all-inclusive data protection software such as unified snapshots and thin clones, unified sync/async replication with throttling and snapshot replication, metro node synch replication, data-at-rest encryption and file level retention. T5000 also supports RecoverPoint continuous data protection and remote replication.

Unified Snapshots – simplifies daily operations by providing a single interface for creating and managing snapshots and thin clones for block and file storage, reducing operational complexity. And with UFS64, you get up to 256 snaps per file system and the ability to create thin clones direct from snapshots. Snapshots can be replicated, refreshed, applied to vVols and compared to report back differences.

Integrated copy data management – supports snapshot mobility & thin clone interoperability with AppSync application-aware and orchestration to provide customers with integrated copy data management (iCDM) saving capacity and costs.

Local and remote replication – includes a full complement of enterprise-grade array-based synch/async replication services as well as RecoverPoint replication options, providing robust protection with no additional investment. Replicate snapshots for greater

data protection and recovery options. Titan T5000 includes native asynchronous and synchronous replication for both file and block data with async throttling, async interface pairing and full copy avoidance. The system also supports the use of Metrosync Manager for automated file level failover and synch replication over metro distances.

File protection – file data is protected with File-level Retention (FLR) for safeguarding files from modification or deletion until a specified retention date. FLR allows you to create a permanent, unalterable set of files and directories and ensure the integrity of data. There are two different types of file-level retention available: Enterprise (FLR-E) and Compliance (FLR-C).

DevOps integrations

Containers are fast becoming the new software architecture paradigm and Kubernetes has emerged as a popular Container Orchestration platform choice. Titan T5000 supports the Container Storage Interface (CSI) plugin to run Kubernetes workloads.

Automation is a major theme in IT Procurement discussions. The good thing is Automation no longer means programming-intensive and hard-to-maintain scripting. Tools like VMware vRealize Orchestrator (vRO) provides a drag and drop environment to quickly automate infrastructure operations and service delivery tasks. Titan T5000 supports vRO plugin enabling customers to automate end to end workflows spanning the entire infrastructure stack.

T5000 Specifications	
Min/Max Drives	6/500
Chassis	2U, 25x 2.5" drives
Drive bays	25x 2.5TB SSD
Storage capacity (as configured)	96 TB (25x 3.84 TB SSD)
Maximum # of drives/enclosures	Max 250x drives or 10x Titan T5000X per BUS (whichever limit is reached first)
Max Raw Capacity ^A	696TB
RAID Options	1/0, 5, 6
CPU per Array	2x Intel® CPUs, 12 cores per Array, 1.7GHz
System Memory/Cache per Array	128 GB
Max FAST Cache per Array ^B	Up to 800 GB
Total Cache ^C	Up to 928 GB
Max IO Modules per Array ^D	4
IO Modules (as configured)	2x 4-port 25GbE SFP+, 2x 2-port 10GbE SFP+
Embedded SAS IO Ports per Array	4 x 4 lane 12Gb/s SAS ports for BE (back end) Connection
Base 12 Gb/s SAS BE Buses per Array	2 x 4 Lane
Max 12 Gb/s SAS BE Buses per Array	2 x 4 Lane
Max FE (front end) Total Ports per Array (all types)	24
Additional Ports per Controller	1x Management Port, 1x Service Port
Embedded 10GbaseT Ports per Array	4
Embedded CNA ports per Array	4x10GbE SFP+
10/25 GbE/iSCSI total ports per array	12 – 10GbE 8 – 25GbE
Standby Power System	2 redundant power supplies per system/enclosure Battery Back Up (BBU) module provides power to a single module (power zone)



T5000 Specifications (continued)

Max Initiators per Array	1024
Max SAN Hosts	512
Max Number of Pools	20
Max Number of LUNs per Array	1000
Max LUN Size	256 TB
Max file systems per Array	1000
Max File System Size	256 TB
Max attached snapshots per Array (Block)	1000
Drive Enclosure (DAE - Disk Array Enclosure)	Supports 25x 2.5" drives in 2U enclosure Titan T5000X (max of 250x drives or 10x DAEs per BUS (whichever limit is reached first))
Dimensions (H x W x D)	8.88cm x 44.76cm x 61.39cm
Weight	24.6 kg

A Maximum raw capacity will vary based on drive sizes available at time of purchase

B GB = Base2 GiB (GiB = 1024x1024x1024)

C Specific to hybrid arrays

D Two IO Modules per Storage Processor (SP), mirrored

Titan T5000x Specifications – Expansion for Titan T5000 only	
Chassis	2U Rackmount
Drive Bays	25x 2.5" HDD/SSD
Storage capacity (as configured)	19TB (12x 1.6TB SSD SAS 12Gb/s)
Connector type	SFF-8088 connectors (mini-SAS)
SAS cable length	Up to 10 meter (2m included)
Dimensions (H x W x D)	8.64 cm x 44.45 cm x 35.56 cm
Weight (fully populated)	20.3 kg

Protocols and Facilities Supported	
Block Protocols: iSCSI, Fibre Channel (FCP SCSI-3)	Container Storage Interface (CSI) Driver
Controller based Data at Rest Encryption (D@RE), with self-managed keys	DFS Distributed File System (Microsoft) as Leaf node or Standalone Root Server
Direct Host Attach for Fibre Channel and iSCSI	Dynamic Access Control (DAC) with claims support
Fail-Safe Networking (FSN)	Internet Control Message Protocol (ICMP)
Kerberos Authentication	Key Management Interoperability Protocol (KMIP) compliant external key manager for D@RE
LDAP (Lightweight Directory Access Protocol)	LDAP SSL
Link Aggregation for File (IEEE 802.3ad)	Lock Manager (NLM) v1, v2, v3, and v4
Management & Data Ports IPv4 and/or IPv6	NAS Servers Multi-protocol for UNIX and SMB clients (Microsoft, Apple, Samba)
Network Data Management Protocol (NDMP) v1-v4, 2-way & 3-way	Network Information Service (NIS) Client
Network Status Monitor (NSM) v1 Network Status Monitor (NSM) v1	Network Time Protocol (NTP) client
NFS v3/v4 Secure Support	NT LAN Manager (NTLM)
Portmapper v2	REST API: Open API that uses HTTP requests to provide management
Restriction of Hazardous Substances (RoHS) compliance	RSVD v1 for Microsoft Hyper-V
Simple Home Directory access for SMB protocol	SMI-S v1.6.1 compatible Dell EMC Unity Block & File client
Simple Mail Transfer Protocol (SMTP)	Simple Network Management Protocol v2c & v3 (SNMP)
Virtual LAN (IEEE 802.1q)	VMware® Virtual Volumes (VVols) 2.0
VMware® vRealize™ Orchestrator (vRO) Plug-in	

All systems are available in individual configurations (drives, network connectivity, support options).

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Software	
All Inclusive Base Software	<p>Management Software</p> <ul style="list-style-type: none"> • Unisphere: Element Manager • Unisphere Central: Consolidated dashboard and alerting • CloudIQ: Cloud-based storage analytics • Thin Provisioning • Dynamic Pools - All-Flash Arrays (AFA) only • Data Reduction: Zero Detect/Deduplication/Compression (AFA and All-Flash Pools in Hybrid Arrays, Block & File) • Host Groups • Proactive Assist: Configure remote support, online chat, open a service request, etc. • Quality of Service (Block and VVols) • Storage Analytics Adapter for VMware® vRealize™ • File & Block Tiering / Archiving to Public/Private Cloud (Cloud Tiering Appliance) • File-Level Retention (FLR-E & FLR-C) <p>Unified Protocols</p> <ul style="list-style-type: none"> • File • Block • VVols <p>Local Protection</p> <ul style="list-style-type: none"> • Controller Based Encryption (optional), with self-managed or external key management • Local Point-In-Time Copies (Snapshots and Thin Clones)
Interface Protocols	NFSv3, NFSv4, NFSv4.1; CIFS (SMB 1), SMB 2, SMB 3.0, SMB 3.02, and SMB 3.1.1; FTP and SFTP; FC, iSCSI and VMware Virtual Volumes (VVols) 2.0
Optional Solutions	<ul style="list-style-type: none"> • AppSync Advanced • Connectrix SAN • Data Protection Suite: Backup, Archive and Collaboration Software • RecoverPoint Advanced • RP4VM • PowerPath Migration Enabler • PowerPath Multipathing • Metro node • VPLEX



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