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New Product Webinar Series – Part 1

- **Titan Primary & Secondary Storage**
- **Presenter: Dan Egan**

CRS
TITAN

Meet the Team

Moderator

Our Presenter

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Agenda

- Introduction
- About Overland-Tandberg
- Titan Primary & Secondary Storage
- Closing | Next Steps

About Overland-Tandberg

- Minority-Owned/Black-Owned/MBE

- NMSDC Certified – Diversity Supplier

- **40+** Years delivering IT data management solutions

- Global footprint in **100+** countries (Americas, EMEA, APAC)

- **4** Hybrid IT Infrastructure portfolios

What's the opportunity for you?

200%+ growth in a single year generated by e-mail/attachments, shared files, application data, large video and image files, more

Coping with Data Growth

Lack of all-inclusive tools to best manage, store, protect and retrieve growing data repositories

Data Management Concerns

Limited IT Staff & Budgets

IT staff consistently directed to accomplish more with less in conflict with limited budgets

Absence of comprehensive data protection strategies/solutions seriously impact the security and availability of data

Data Protection Concessions

Complex and Limiting Solutions

Lack of time, resources and budget constraints need to be addressed via intuitive solutions designed with IT generalists in mind

Project Opportunities

Serve a data center project from one single source
addressing the SMB, SME, Midrange and Enterprise segments

- Olympus Servers

- Titan T2000: SAN & DAS solutions
- Titan T3000: PBBA appliance
- Titan T5000: Unified Storage
- Titan T6000: Scale-out Archive NAS

- NEO Tape libraries

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Titan T2000
SAN/DAS storage

(based on Dell PowerVault ME5024 and ME4xx)

Titan T2000 reveals the business value of your investment

Titan T2000

Performance & Capacity
More processing power & capacity to support high-value workloads

Balanced Costs
Cost-effective balance of performance and price/TCO

All-inclusive Software
Everything needed by IT to store, manage and protect data

Management Ecosystem
Intuitive navigation, features and analytics for the IT generalist

Outcomes

Workload Diversity
Run it all from backup to DBs to HPC to Edge solutions & more

Affordable Entry Storage
IT is enabled to do much more and with less budget needed

Everything You Need
Easy to purchase and cost effective to own with no separate licensing

Simplified Management
Better quality & time saving management for the IT generalist

Titan T2000

Entry storage that's purpose-built and optimized for **SAN, DAS** and **Edge**

SIMPLE

Easy to install/configure; simple to manage; proactive storage analytics; PowerEdge ready

FAST

Powerful IOPs; high bandwidth; fast host connectivity; 12Gb SAS backend

AFFORDABLE

Low-cost configs & TCO; easy to own all-inclusive SW; pay-as-you-grow

BLOCK STORAGE | MULTIPLE PROTOCOLS | HIGHLY SCALABLE | DIVERSE USE CASES

Titan T2000

Titan T2000 Technical Overview

Performance and capacity advancements

T2000

2U-24 drives

EBOD Expansion Enclosures

T2084X

T2012X   **T2024X**

2U-12 drives   2U-24 drives   5U-84 drives

Max Raw Capacity	System (7.68TB SSD)	184TB	
	Max.encls. (18TB)*	4.53PB	9 x 2U enclosures behind T2000 3 x 5U enclosures behind T2000
Min/Max Drives		2/276	
Controllers		Dual	
Controller Memory		16GB per controller	
Storage as configured		4x 960GB SSD SAS ISE Read Intensive 12Gbps 512	
Networking Connectivity		16/32Gb FC, 10Gb iSCSI BaseT, 10/25Gb optical iSCSI, 12Gb SAS	12Gb SAS Backend
Warranty		3Y ProSupport and Next Business Day Onsite Service	
Operational Modes		Virtual (all data services) & Linear (performance-based)	
Performance		640K IOPs, 100% Sequential Reads, 16K block, R5, Virtual	
Throughput		12GB/s Read & 10GB/s Write	
HW Availability		5-9's (Dual controller mode only)	

* 3 x 5U enclosures with 18TB Hard Drive SAS ISE 12Gbps 7.2K 512e 3.5in Hot-Plug

Titan T2000X Expansion Enclosures

T2084X

T2012X

2U-12x 2.5"/3.5"drives

T2024X

2U-24x2.5"drives

5U-84x 2.5/3.5" drives

- expand T2000 only
- Up to 9 enclosures
- SAS 12Gb/s drives
- connected via SAS

- expand T2000 only
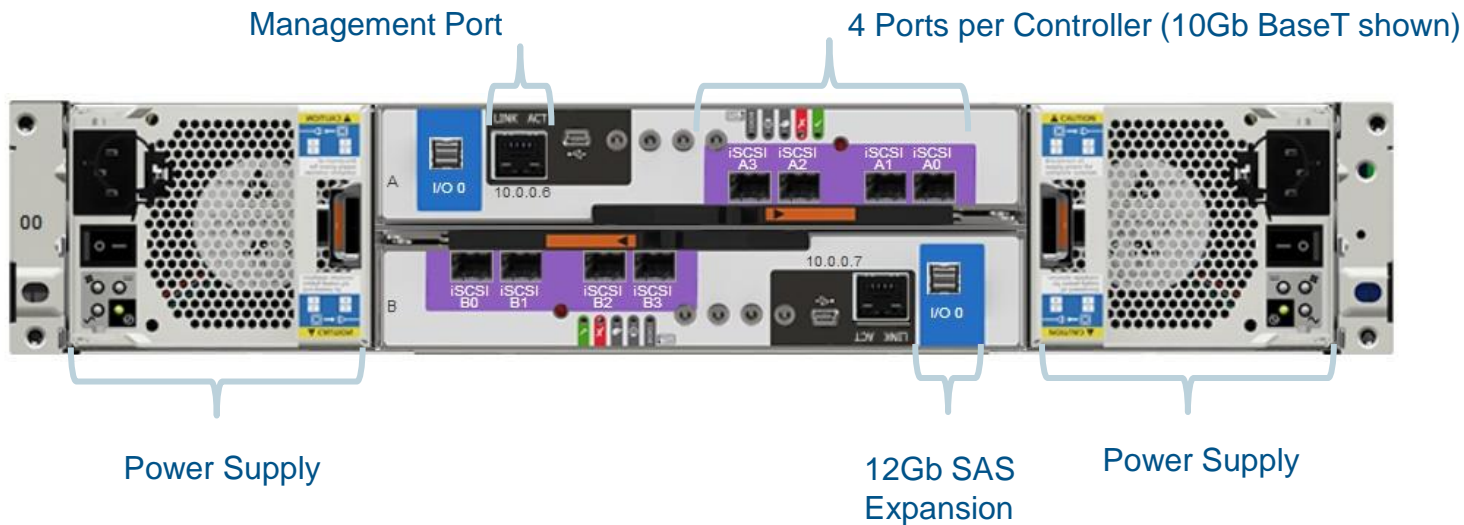- Up to 9 enclosures
- SAS 12Gb/s drives
- connected via SAS

- expand T2000 or Olympus servers or any legacy server
- Up to 3 enclosures
- SAS 12Gb/s drives
- connected via SAS

Titan T2000 Front View

Mandatory quantity for T2000:
4, 8, 12, 16, 20, 24 drives
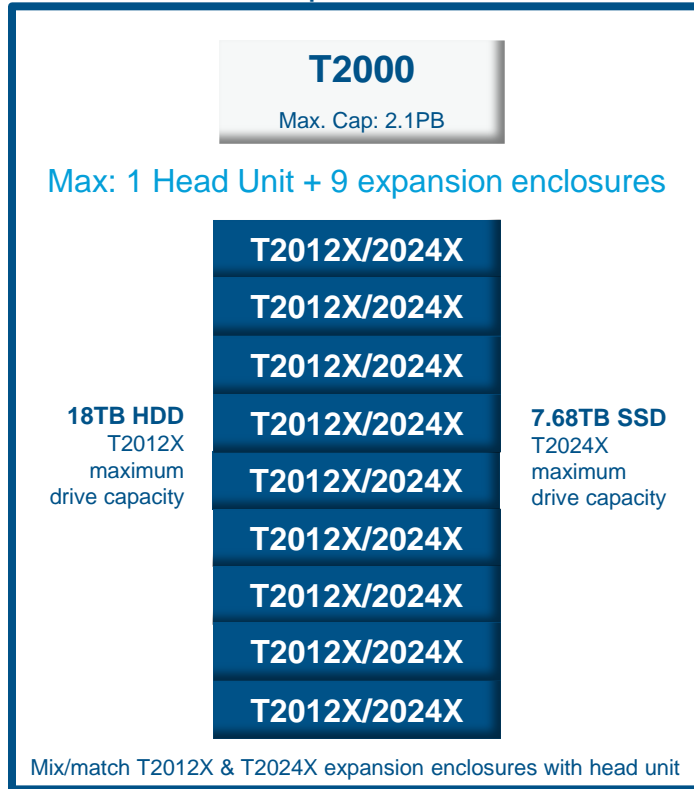Mix and match is possible

Titan T2000 Rear View

Management Port

4 Ports per Controller (10Gb BaseT shown)
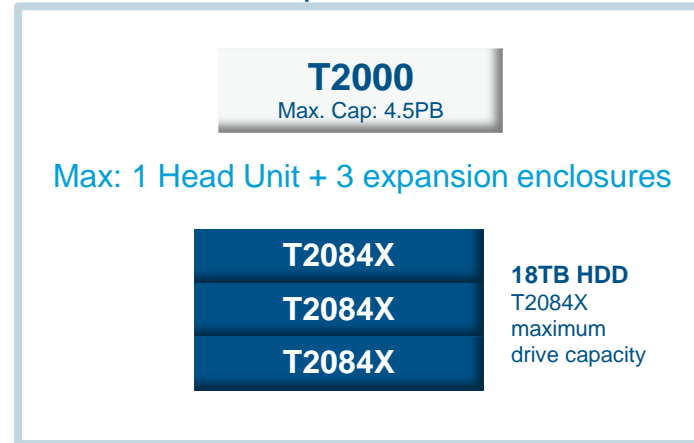
Power Supply

12Gb SAS Expansion

Power Supply

- 4 ports 10/25Gb iSCSI SFP+/SFP28
- 4 ports 1/10Gb iSCSI BaseT
- 4 ports 16/32Gb FC SFP/SFP+
- 4 ports 12Gb SAS

Titan T2000X Capacity Expansion Scenarios

Expansion 1

T2000
Max. Cap: 2.1PB

Max: 1 Head Unit + 9 expansion enclosures

18TB HDD
T2012X maximum drive capacity

T2012X/2024X
T2012X/2024X
T2012X/2024X
T2012X/2024X
T2012X/2024X
T2012X/2024X
T2012X/2024X
T2012X/2024X
T2012X/2024X

7.68TB SSD
T2024X maximum drive capacity

Mix/match T2012X & T2024X expansion enclosures with head unit

Expansion 2

T2000
Max. Cap: 4.5PB

Max: 1 Head Unit + 3 expansion enclosures

T2084X
T2084X
T2084X

18TB HDD
T2084X maximum drive capacity

Mixing 2U & 5U expansion enclosures is not allowed

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Titan T2000 Drive Support
Flexibly configure as HFA, AFA, HDD-only

Drive Type	Capacity	RBOD T2000	EBOD T2012X	T2024X	T2084X
NLSAS 3.5"	4TB	N/A	Yes	N/A	Yes
	8TB	N/A	Yes	N/A	Yes
	12TB	N/A	Yes	N/A	Yes
	16TB	N/A	Yes	N/A	Yes
	18TB	N/A	Yes	N/A	Yes
10K SAS	2.4TB	Yes	Yes	Yes	Yes
SSD SAS	960GB	Yes	Yes	Yes	Yes
	1.92TB	Yes	Yes	Yes	Yes
	3.84TB	Yes	Yes	Yes	N/A
	7.68TB	Yes	Yes	N/A	N/A

- RBOD – **R**aid **B**unch **O**f **D**isks
- EBOD – **E**xtended **B**unch **O**f **D**isks

Note:
Only these drives can be used in T2000 arrays and expansion chassis.

Mandatory quantity for T2084X: 28,42,56,70 or 84 drives
Mix and match is possible

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Titan T2000 is All-Inclusive

No costly licensing makes T2000 easier to own, deploy and use

ADAPT RAID Functionality enabling affordable capacity expansion & faster drive rebuild times.	**Thin Provisioning** Allocate and consume physical storage capacity as needed in virtual disk groups	**SSD Read Cache** Increase execution speed of application IO by caching previously read data

| **Asynchronous Replication** Replicate data over FC and iSCSI to any global location that includes mirroring, thin provisioned pools.	**Snapshots** Scheduled & on-demand volume Copy on Write snapshots with rollback & refresh options	**Auto-Tiering** Improve performance and efficiency with less hardware expense

Linear Mode: ADAPT, CloudIQ, CLI, Management, SupportAssist, Encryption
ADAPT: Autonomic Distributed Allocation Protection Technology
Virtual Mode: All software available for use

Titan T2000 is All-Inclusive

No costly licensing makes T2000 easier to own, deploy and use

Volume Copy	**Supported Integrations**
Seamlessly clone volumes for re-purposing on different spindles and drives	vCenter & SRM integration to move live VMs at scale between sites; Automate storage mgmt. with SMI-S / SCVMM to run Hyper-V VMs

PowerVault Manager	**CloudIQ**
Native HTML5 management interface for configuring, provisioning, managing, monitoring a single Titan T2000 array	Cloud-native monitoring application that uses ML/AI and predictive analytics from telemetry gathered across thousands of systems to provide system health scores, anomaly detection & proactive remediation

Management Ecosystem	**SupportAssist**
Integrate with Nagios Core/XI for auto-discovery, inventory, monitoring and provide increased scalability for unified datacenter management with OpenManage Enterprise (OME) integration	An embedded protocol connected to Dell to help you proactively maintain the health of your T2000 array; Required for CloudIQ

Linear Mode: ADAPT, CloudIQ, CLI, Management, SupportAssist, Encryption
ADAPT: Autonomic Distributed Allocation Protection Technology
Virtual Mode: All software available for use

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Titan T3000/3000X PBBA

(based on Dell PowerProtect DD6400)

About PBBAs
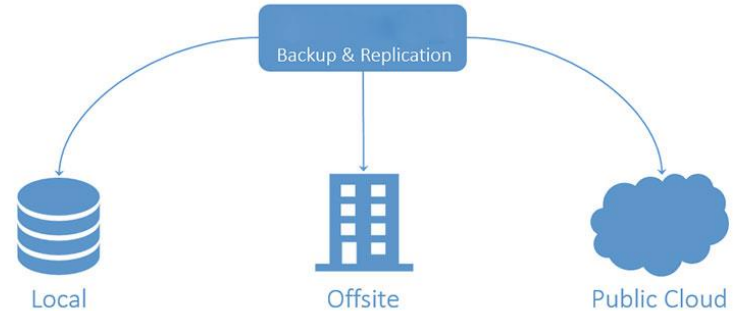
- Specifically store backup data sets in the format of the backup software
- High rates of data deduplication, effectively lowering $/GB backup retention
- Highly efficient data replication to facilitate rapid backup from remote offices
- Protocol translation (e.g., S3, OpenStack) for data transfer to cloud repositories ("cloud tiering")
- Protecting against ransomware attacks and rapidly recovering from them by separating the control plane and the data plane with an "air gap"
- Can be used with almost any current backup/recovery software, and can be added to an existing environment

Titan T3000

Powered by Data Domain Operating System (DD OS)

Efficient

Up to 65x reduction in storage requirements with variable-length deduplication

Gain industry leading **speed, scalability, and reliability**

Comprehensive

Widest protected workload ecosystem ranges from physical to homegrown to virtual applications

Deploy protection storage however you want it – physical, software-defined or cloud-enabled

Cloud-enabled

Natively tier deduplicated data to the cloud for long-term retention

Copy backed-up VMs to the public for disaster recovery

Titan T3000

Ideal for Commercial, smaller Enterprise & remote site Large Enterprise segments

TYPICALLY

65:1

Deduplication [2]

- Built on Dell PowerEdge Server 740xd 14G platform
- Internal capacity 32TBu
- Expansion capacity up to 172TBu
- Includes Compression card
- Bundles Cloud Tier, Boost, Replication
- 25 GbE card option
- 8TB drives only DDOS 7.7 and above

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Model Specifications

	T3000	T3000X expansion
Chassis	2U	3U
Backup Throughput, TB/hr (DDBOOST)	24+	24+
Controller Upgrade Support	No	No
Capacity, Min	32 TBu	104TBu
Capacity, Max	172 TBu	172TBu
Network as configured	1x 4-Port 10GBASE-T 2x 4-Port 10G SFP+ (incl. optics)	
Cloud Tier Support	✓	✓
Retention Lock – Compliance	✓	✓
DD Boost/FC Backup Available	✓	✓
25GbE Available	✓	✓
Higher effective capacity (Compression Card)	✓	✓

Titan T3000 Hardware Platform
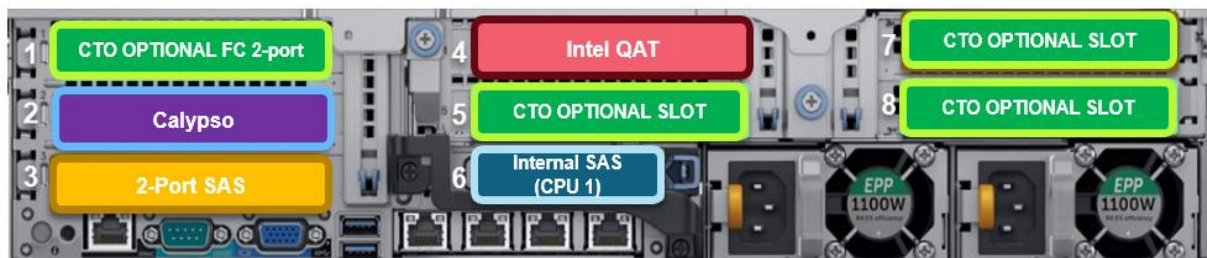
PE R740xd - 12 drive slot version

- 2x Xeon CPU
- 192GB RAM
- 2x 750W PSU
- IO Slots: 1x rNDC, 3x Ethernet, 1x FC
- 2x SSD for OS
- 1x SSD for Cache
- 8x 8TB Data drives

Titan T3000 IO Card Options
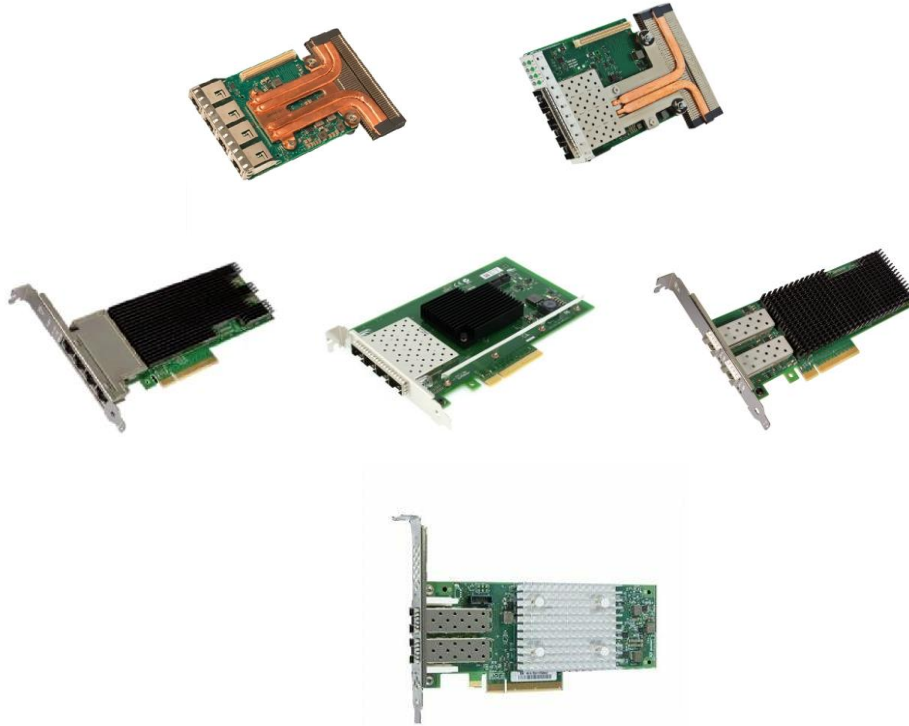
Required rNDC Ethernet, 1x card:
- 4-port 10Gb BASE-T **or**
- 4-port 10Gb SFP

Optional Ethernet (CTO), up to 3x cards:
- 4-port 10Gb BASE-T
- 4-port 10Gb SFP
- 2-port 10/25Gb

Optional Fibre Channel (CTO), 1x card, dedicated slot:
- 2-port 16Gb FC

DD Boost: Faster, more efficient backup

- Advanced native integration with leading backup and enterprise applications

- Speeds backups by up to 50% (compared to CIFS/SMB)

- Efficient backup and replication, controlled by the app team

- Reduce network utilization by up to 98% (compared to CIFS/SMB)

Application Client

Data Domain System

DD Boost

Client-Side Deduplication

Backup Server

DD Boost

DD Boost

WAN

DD Boost
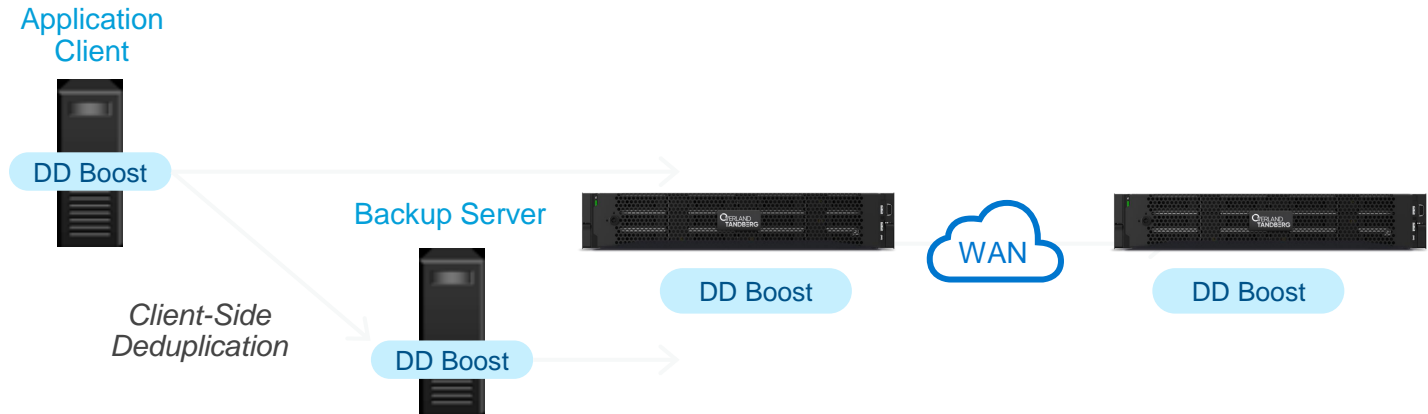
Cloud Tier: Expanded Support
Unparalleled efficiency for tiering protection storage to the cloud
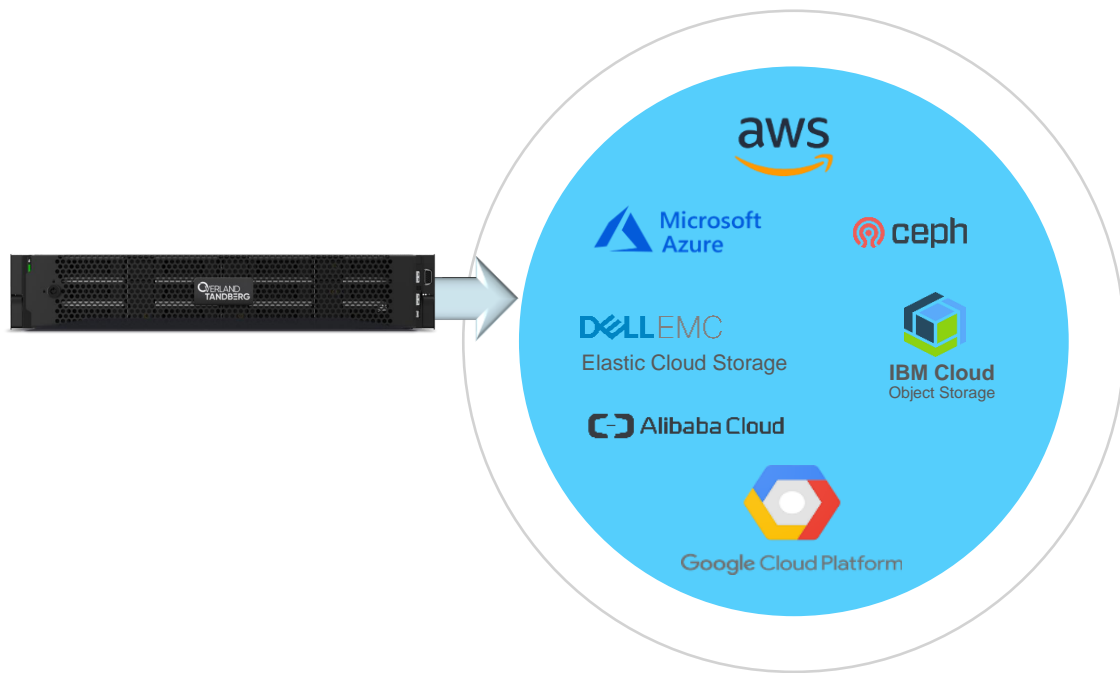
Simple
automated, native tiering to public, private or hybrid cloud

Cost-effective
send and retrieve only unique data and reduce transactional overhead to lower TCO

Open
broad ecosystem and flexible deployment options

Titan T5000/T5000X
Unified Storage

Based on Dell Unity XT380

O-T Titan T5000
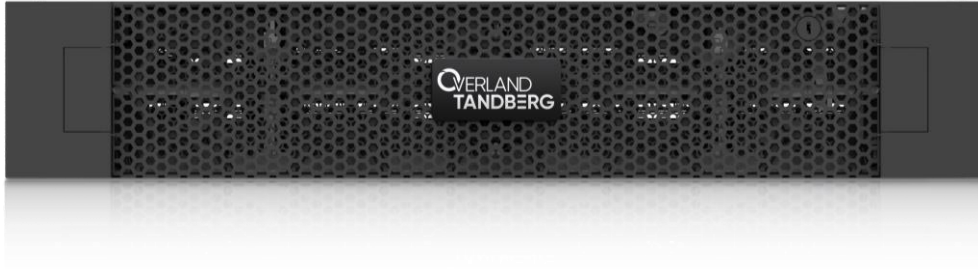
Designed for **PERFORMANCE**

Optimized for **EFFICIENCY**

Built for **MULTI-CLOUD**

Performance

- impressive performance to run virtualized environments and file storage at the same time

Efficiency

- 3:1 data reduction (depends on data structure)
- 85% system efficiency
- reputation for simplicity

Multi-Cloud

- Cloud Data Services
- Cloud Connected Systems
- Cloud Data Insights

Titan T5000 Configuration

T5000 – 2U/25 drives

T5000X – 2U/25 drives

Max Raw Capacity	System (3.84TB SSD)	96TB	Max. 250x drives or 10x Titan T5000X per BUS (whichever limit is reached first)
	Max. with encls. (1.6TB drives)	496TB	
Min/Max Drives		6/275	
Controllers		Dual (1.7GhZ CPU 12 Cores 2x Single-Socket)	
Controller Memory		64GB per controller	
Connectivity		10Gb iSCSI BaseT, 10/25Gb iSCSI Optical	12Gb SAS Backend
Max FAST cache per array		up to 800 GB	
Total cache		up to 928 GB	
Max. SAN hosts		512	
Max. number of pools		20	
HW Availability		5-9's (Dual controller mode only)	

Titan T5000 – Front View

- Single form factor for Unified (Block and File)
  - 25x Drive Slots capable of supporting:
    - SAS / SAS Flash
  - First 4x Drive Slots for System Drives
  - 2x Storage Processors per DPE
    - Storage Processor A (SP A) – Bottom half
    - Storage Processor B (SP B) – Top half
  - 2U in height (rack units)

- Each Storage Processor will contain a <u>single</u> M.2 device

Titan T5000 - Backplane

12Gb SAS
BACKEND
(2 per controller)

BUILT-IN
10Gbe ports
(2 per Controller)

MANAGEMENT
AND SERVICE PORT
(1+1 per Controller)

2U
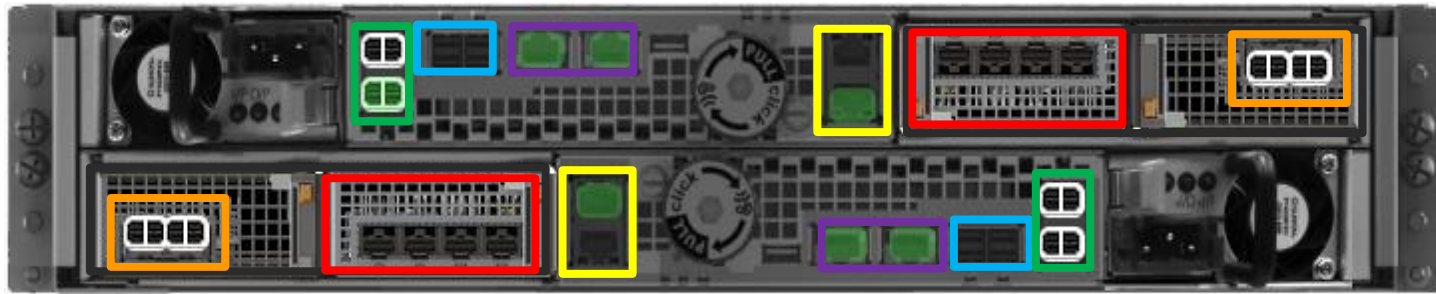
10GbE SFP+
(2 per Controller)

4-port 25/10GbE SFP+
(1 per Controller)

BUILT-IN 10GbE SFP+
(2 per Controller)

T5000 - Technical Specifications

Min/Max Drives	6/275
Chassis	2U
Drive bays	25x 2.5" SAS drives
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	496TB
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	Up to 800 GB
Total Cache	Up to 928 GB
Max IO Modules per Array	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
Max FE (front end) Total Ports per Array (all types)	24
Embedded 10Gbe Ports per Array	4x
Embedded CNA ports per Array	4x 10GbE SFP+
10/25 GbE/iSCSI total ports per array	8x 10GbE SFP+ 8x 25/10GbE

The quantity of drives can be configured in 5x steps (5, 10, 15, 20, 25)

Titan T5000X Enclosure

2U, 25-Drive 2.5" Enclosure

Supports 12Gb SAS and SAS Flash:

- 1.6TB 2.5" SAS, max. 40TB per Enclosure

Rules for SAS backend cabling:

Max of 250x drives or 10x DAEs per BUS (whichever limit is hit first)

Titan T5000 Software is All-Inclusive

No costly licensing makes it easier to own, deploy and use

Cloud-based Storage Analytics[1] Comprehensive health scores for storage	**Thin Provisioning** Maximize your available capacity	**Unified Management** Configure & manage file, block, vVol objects	**Central Management** Manage multiple T5000 systems	**Dynamic Pools** Faster drive rebuild times & save costs	**CSI Plug-in**[1] Easily deploy and consolidate containerized workloads with Kubernetes
Unified Sync & Async Replication Throttling, full copy avoidance, interface pairing, snapshots	**Compression & Deduplication** Advanced inline data reduction with zero detect	**Software Defined Storage**[1] HA file/block storage to run on premise or on AWS in VCF		**Cloud Tiering Appliance**[1] Automated, policy-based unified data tiering to clouds	**REST API** Connect interactive apps with web svcs
CEE/CAVA Framework Easily connect to popular anti-virus solutions	**Data At Rest Encryption** Protect all business data residing in the array	**QoS (Host IO Limits)** Limit host IO and bandwidth to specified block resources	**File Level Retention** Protect files from modification or deletion	**Virtualization Integration** Vmware, Microsoft, OpenStack	**IP Multi-Tenancy** Assign isolated partitions to NAS Servers

[1] No cost download software, not included with array

Titan T6000
Archive NAS Platform

(based on Dell PowerScale A300)

Titan T6000
High performance, nearline, active archive

Form factor	4U
Chassis Capacity	240TB
SATA HDD drives (3.5") per Chassis	60
Raw node capacity	60TB
ECC memory (per node)	96GB
Nodes per cluster	4 to 252
Cache (per node) solid state drives 1.6TB	1
Raw cluster capacity	60TB to 75PB
Front-end networking (per node)	2 x 25GbE (SFP28)
Infrastructure networking (per node)	2 x 25GbE (SFP28)
Inline Data Reduction	Yes

Titan T6000 Architecture

- Each platform node contains CPU, memory, disk, and I/O controllers 4U rack-mountable chassis.
- Redundant Ethernet adapters provide a high-speed back-end cluster interconnection
- Highly available storage client access is provided over multiple 25Gb/s Ethernet interface controllers within each node
- various file and object protocols, including NFS, SMB, S3, and HDFS
- full support for both IPv4 and IPv6 environments
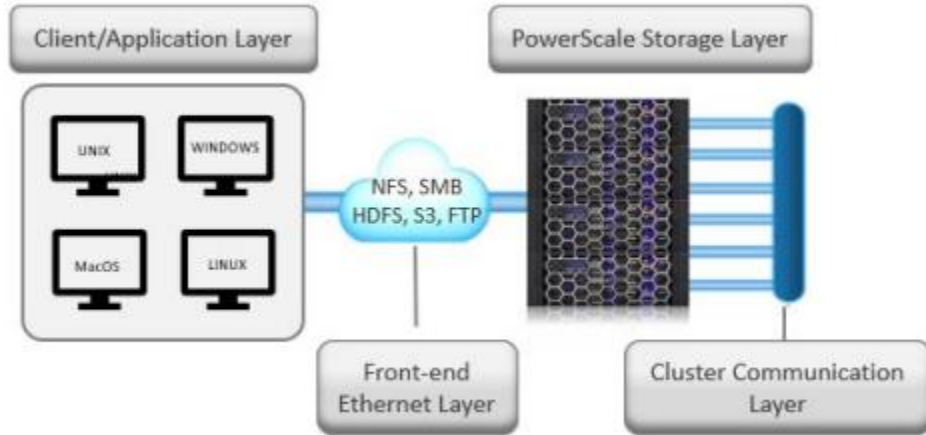
Simplicity at Scale

Enterprise class scale-out data services

Any Scale
From 240TB to multi-PB scale and millions of file operations

No Node Left Behind
Non-disruptive tech refresh, Add nodes in 60 seconds

AutoBalance ®
Smart scale-out cluster ensures no hot spots

Resilient
Sustain multi-node failures with no data loss

Efficient
Inline data reduction and automated tiering

DevOps Ready
New Ansible Kubernetes & OpenShift integrations

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Inline Data Reduction

- Data Reduction Platform
- Compression Engine and Chunk Map
- Zero block removal phase
- Deduplication In-memory Index and Shadow Store Infrastructure
- Data Reduction Alerting and Reporting Framework
- Data Reduction Control Path

The inline data reduction write path consists of three main phases:
- Zero Block Removal
- In-line Deduplication
- In-line Compression

If both inline compression and deduplication are enabled on a cluster, zero block removal is performed first, followed by deduplication, and then compression. This order allows each phase to reduce the scope of work each subsequent phase has to perform.

OneFS Software Features 1/2

Software	Feature	Description
SMARTDEDUPE	Data management	Increase efficiency and reduce storage capacity requirements with deduplication of redundant data across multiple sources
CLOUDIQ	Data management	Simplify the storage management tasks of PowerScale, Isilon and other Overland-Tandberg hardware with predictive analytics capabilities from a single console
DATAIQ	Data management	Locate, access and manage data and gain a holistic view across heterogeneous storage systems with a single pane of glass
SMARTQUOTAS	Data management	Assign and manage quotas at the cluster, directory, user, and group levels
INSIGHTIQ	Performance management	Performance monitoring and reporting

OneFS Software Features 2/2

Software	Feature	Description
SNAPSHOTIQ	Data protection	Protect data efficiently and speed the recovery of critical data with ondemand snapshot restores
SMARTLOCK	Data retention	Protect your critical data against accidental, premature, or malicious alteration or deletion and meet compliance and governance needs
SMARTCONNECT	Data access	Enable client connection load balancing and the dynamic failover and failback of client connections
CLOUDPOOLS	Resource management	Seamless tiering of cold or frozen data to public or private cloud providers
SYNCIQ	Data replication	Securely replicate data sets to multiple sites for reliable disaster recovery and use push-button failover and failback
SMARTSYNC	Replication	Replicates data between T6000 systems and also public clouds like Microsoft Azure and AWS

Introducing S3 access

Developer

App   App   App

S3

PowerScale OneFS

Researcher
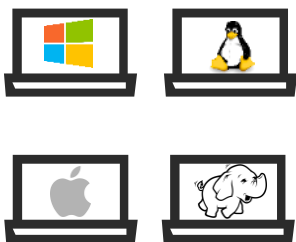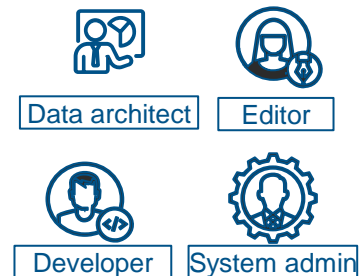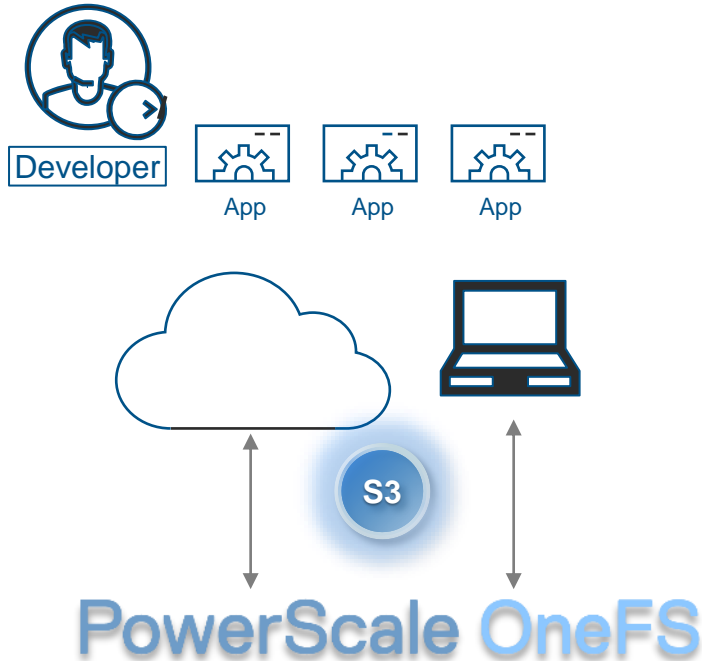
DATA READ & WRITE

All data simultaneously read and write
through any protocol

System admin

DATA MIGRATION & COPIES

No need to migrate & copy data to / from
secondary source

Video editor

DATA CONSOLIDATION

File & object access
on the same platform

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Additional Materials

Documents at Your Service

Data Sheet – T2000/T2000x
Data Sheet – T3000
Data Sheet – T5000
Data Sheet – T6000
Data Sheet – Titan Family

Manuals, Whitepapers, User & Deployment Guides and much more:
Data Storage Solutions - Overland Tandberg

Titan T2000/T2000x Resources

- Data Sheet – T2000/T2000x
- Data Sheet – Titan Family
- Admin Guide
- Cheat Sheet
- Deployment Guide
- Owners Manual
- Reference Guide
- User Guide – vSphere Client
- Whitepaper – MS Hyper-V
- Whitepaper – MS SQL Server
- Whitepaper – VMware Horizon
- Whitepaper – VMware vSphere
- Whitepaper – Titan CloudIQ

Register Now!

Don't forget to register in our new Partner Portal:

- Easy to use deal registration and deal protection
- Access to the latest pricelists and promotions
- Access to Overland-Tandberg marketing materials and the ability to co-brand
- Events: Free webinars and product trainings for registered resellers, tradeshows

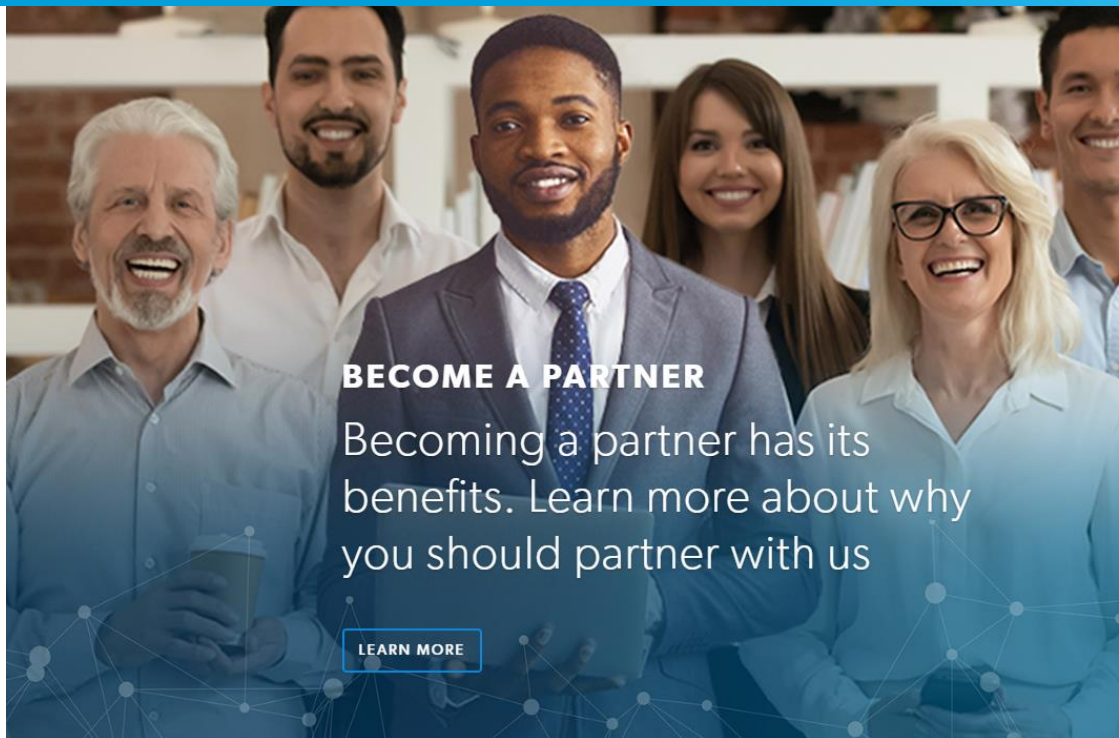https://partners.overlandtandberg.com/English/

Overland-Tandberg Partner Program

Partner Program:

- Three different partner levels
- Bonus for target achievement and growth
- Dedicated technical trainings and support
- Marketing support on demand

Become A Partner - Overland Tandberg

BECOME A PARTNER

Becoming a partner has its benefits. Learn more about why you should partner with us

LEARN MORE

Overland-Tandberg for Government

Public Sector
- Overland-Tandberg - Solutions for Government
- TAA-compliant Products

Overland-Tandberg Product Portfolio
- Titan Primary & Secondary Storage
- Olympus Tower & Rackmount Servers
- NEO LTO Backup & Tape Archive
- RDX Removable Disk Drives | SSD & HDD

Other Info
- Webinar Event Archive
- Contact us: Sales@OverlandTandberg.com

Certified
Diversity Supplier

Thank You

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