



HIGHLIGHTS

- **Hardware-accelerated Network Storage with up to 10 Gbps throughput and up to 100,000 IOPs**
- **Dynamically scalable storage up to 2 PB under a single namespace with file systems up to 256 TB**
- **Scalable N-Way high availability clustering technology**
- **Dynamic read caching for scalable read intensive workloads**
- **Supports over 16 million files per directory**
- **Unified NAS & SAN**
- **Cluster Namespace for unified directory structure**
- **Tiered Storage across FC and SATA**
- **Virtual Volumes and Servers**
- **Integrated WORM file system**
- **Policy-based management & transparent data migration**
- **Advanced data protection and**

Titan 2000 Series High Performance Network Storage

BlueArc's Titan 2000 Series is designed to meet the requirements of today's sophisticated enterprise data centers and vertical applications with new levels of storage performance, scalability and reliability. Titan is the first storage solution that consolidates and manages up to two (2) petabytes (PB) of data in a single namespace. In addition, Titan supports a Cluster Namespace for a unified directory structure and global access to data for CIFS and NFS connectivity through any node with seamless extensibility from two (2) to eight (8) node clusters.

Titan is designed with a scalable modular blade architecture to accommodate a wide range of demanding performance requirements. The 2100 model support 5 Gbps of aggregate throughput performance at the entry level, and the 2200 model support 10 Gbps of aggregate throughput for high performance configurations. The 2500 model has been specially configured to provide maximum performance in corporate environments with 10 Gigabit Ethernet LAN connectivity and enhanced protocol acceleration to scale large numbers of Windows clients and application servers. As data and user population grows, or as workstation and application server performance accelerates, Titan can easily scale up to eight (8) nodes in a single cluster to meet demanding changes in access, capacity and performance.

Titan is built on the hardware accelerated architecture and offers enterprise-class management tools – including data migration, replication and anti-virus support. This customer-proven, hardware-based architecture maximizes data access and sustains high levels of user loads with extremely low latency, resulting in increased productivity and significantly reduced cost of ownership.

Titan 2100 vs. 2200/2500 Comparison

TITAN 2100		TITAN 2200/2500	
System Class	Mid-Range	System Class	High Performance
Aggregate Throughput	5 Gbps	Aggregate Throughput	10 Gbps
IOPS Performance	<ul style="list-style-type: none"> • 76,000 Node* • 150,000 Two Node Cluster* 	IOPS Performance	<ul style="list-style-type: none"> • 98,000 Node* • 195,000 Two Node Cluster*
<i>2100 Optimized for <1.5 to 3 Million open files and 3000 files in cache</i>		<i>2200 Optimized for >1.5 to 3 Million open files and 6000 files in cache 2500 is estimated performance</i>	

TITAN 2000 SERIES HARDWARE SPECIFICATIONS

Number of slots	4-slot chassis
Chassis backplane bandwidth	40 Gbps (full-duplex)
Titan modules	<ul style="list-style-type: none"> • Network Modules <ul style="list-style-type: none"> - 6 x 1 GbE Network Module - 2 x 10 GbE Network Module • File System Modules <ul style="list-style-type: none"> - File System Module A - File System Module B - File System Module X (Optional Upgrade) • Storage Module <ul style="list-style-type: none"> - 4 x 4 Gbps Fibre Channel Module
Power supplies (PSU)	Dual, load-sharing, hot-swappable power supplies
Server diagnostics	Server status and power LEDs
PSU diagnostics	AC and Battery Status LEDs
Cooling	Hot-swappable N+1 fan assembly

CLUSTERING

Cluster interfaces	10 Gigabit Ethernet
N-Way High Availability	True 8-Way Active-Active Clustering
Number of ports	Dual ports, SR XFP 300 meters, LR XFP 10 kilometers
Optional licenses	<ul style="list-style-type: none"> • High Availability Active-Active Clustering • Cluster Namespace • Dynamic Read Caching

MANAGEMENT INTERFACE

Ethernet interface	Server status and power LEDs
Serial interface	AC and Battery Status LEDs
Ethernet port diagnostics	<ul style="list-style-type: none"> • Port Status LEDs • Port Activity LEDs

*SPECsfs® is a registered trademark of the Standard Performance Evaluation Corporation (SPEC). The Titan 2000 IOPS results are from testing using the SPECsfs® Benchmark Suite specifically designed to measure NFS file server performance. The BlueArc testing results are available on the public www.spec.org web-site.

DIMENSIONS

Height	Height EIA 4U (7", 17.8 cm)
Width	IEC Rack Compliant (19", 48.4 cm)
Depth	25" (63.6 cm)
Weight	78 lbs (52Kg)

MTBF

TITAN system	500,000 hours
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THERMAL RATING

Titan System BTU/h	<ul style="list-style-type: none"> • 1535 BTU/h (Maximum @ 450W) • 1160 BTU/h (Typical @ 340W)
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POWER ATTRIBUTES

AC power option 450W	<ul style="list-style-type: none"> • 4.1A (max.) @ 110 VAC, 450W Optional • 2.2A (max.) @ 208 VAC, 450W • 2.0A (max.) @ 230 VAC, 450W
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REGULATORY COMPLIANCE

CSA 60950-00, UL 60950, EN 60950
 FCC Part 15 Class A, EN 55022 Class A, EN 55024
 89/336/EEC Electromagnetic Compatibility Directive
 72/23/EEC Low Voltage Directive
 98/68/EEC CE Marking Directive

Titan Module and Storage Specifications



NETWORK INTERFACE MODULE (NIM MODULE)

- User interface type
- Gigabit Ethernet, IEEE 802.3z
 - 10 Gbit/s Ethernet, IEEE 802.3ae
 - Full-duplex support, IEEE 802.3x
 - Link aggregation (LAG), IEEE 802.3ad
 - Jumbo frame support (up to 9,180 bytes)
 - VLAN Tagging IEEE 802.1Q

Number of ports	Two 10 Gigabit Ethernet ports
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- Data interfaces
- 1000BASE-SX (500m Optical), SFP
 - 1000BASE-TX (100m Copper), SFP
 - 10GBASE-SR (300m Optical), XFP
 - 10GBASE-LR (10-25km Optical), XFP
 - 10GBASE-ER (40km Optical), XFP

Port configuration	<ul style="list-style-type: none"> • Port independent configuration • Multiple IP addresses per interface (up to 32 total)
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Module diagnostics	Module Status LEDs
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Port diagnostics	<ul style="list-style-type: none"> • Port Status LEDs • Port Activity LEDs
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FILE SYSTEM MODULES

FSA General Purpose File System Module (Top Module)

FSX Accelerated File System Module (Optional Top Module)

FSB File System NVRAM Module (Bottom Module)

System NVRAM 2GB

STORAGE INTERFACE MODULE (SIM MODULE)

User interface type Fibre Channel, SFP connectors

Number of ports	<ul style="list-style-type: none"> • Quad FC ports • Dual 10 GbE Cluster Ports
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FC port interfaces	1, 2, or 4 Gbps, Switched or Point-to-Point
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Port configuration	Port independent configuration
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Module diagnostics	Module Status LEDs
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Port diagnostics	<ul style="list-style-type: none"> • Port Status LEDs • Port Activity LEDs
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DISK STORAGE SUB-SYSTEM ATTRIBUTES

Hard disk drive types supported Tiered Storage Supported with Mixed Fibre Channel (FC) and Serial ATA (SATA) Disks

BlueArc Storage Arrays	<ul style="list-style-type: none"> • RC16TB: Dual hardware-based FC controllers in a 16 Drive enclosure for High Performance FC or SATA drives • RC16SA: Dual hardware-based FC controllers in a 16 Drive enclosure for SATA drives only • DS16EXP: 16 drive expansion module supporting RC16TB & RC16SA Controllers • SA-48: Dual hardware-based FC controllers in a dense 4U sub-system with 48 SATA drives only
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HDS Storage Arrays	<ul style="list-style-type: none"> • HDS Adaptable Modular Storage - WMS 100, AMS 200, 500, 1000 • HDS Universal Storage Platform - USP, USP-V and USP-VM • HDS Network Storage Controller - NSC 55
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Titan Software Specifications



Web based graphical user interface

PROTOCOLS SUPPORTED

- Network protocol support
- Common Internet File System (CIFS)
 - Network File System (NFS) - v2, v3 and v4
 - NDMP v2, v3, and v4
 - File Transfer Protocol (FTP)
 - iSCSI

Management protocols	HTTP, SSL, SSH, SNMP v1 and v2c, NIS, DNS, WINS, NTP, Email Alerts
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FILE SYSTEM ATTRIBUTES

File system	BlueArc File System Hardware-based File System
Multi-protocol support	Simultaneous CIFS and NFS
Maximum file system size	256 TB, dynamically scalable
Maximum storage supported	Architected for up to 2 PB under a single namespace
Maximum files per directory	Up to 16 Million files
RAID striping	Automated Parallel RAID Striping and Multi-Pathing

NDMP BACKUP ATTRIBUTES

NDMP support	NDMP v2, v3 and v4
Tape library system	Support for SAN and LAN Connectivity
NDMP features	<ul style="list-style-type: none"> • Direct Access Recovery (DAR) • 3-Way Backup and Restore

SYSTEM MANAGEMENT ATTRIBUTES

Integrated system management encompassing:	<ul style="list-style-type: none"> • Titan Storage Server(s) • RAID controller management • Disk sub-system management - Enclosures and disks • FC Switch management
Standard management features	<ul style="list-style-type: none"> • Manage up to eight (8) Titan Servers per SMU • Replication management • Automated system configuration and backup • Enhanced system monitoring • Anti-virus support • Out-of-band Ethernet management network • Role-based management
Management interfaces	<ul style="list-style-type: none"> • GUI based: web browser accessible • CLI-based: Telnet, Serial • Scripting: supports scripting for automated management
Secure management access	<ul style="list-style-type: none"> • SSL • SSH • HTTPS
Management access control	<ul style="list-style-type: none"> • User/Password authentication • Management port definition • Management access method • Access Control Lists (ACL's) • NIS, Active Directory, and LDAP
SNMP support	<ul style="list-style-type: none"> • SNMP v1 and v2c • SNMP Traps

SUPPORTED FEATURES

Standard Features:	<ul style="list-style-type: none"> • Centralized Management • Snapshots & Quick Restore • Incremental Data Replication (IDR) • Virtual Volumes (ViVols) • Virtual Servers • Quotas - volume, group or user • NDMP (LAN-free backup) • Anti-Virus Support • Storage Pools
Optional Features:	<ul style="list-style-type: none"> • NFS • CIFS • iSCSI with Multipath (MPIO) • Virtual Server Migration • Data Migrator • Active-Active Clustering • Cluster Namespace • Incremental Block Replication (IBR) • Synchronous Volume Mirroring • WORM file system • Dynamic Read Caching



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