SUN ZFS STORAGE APPLIANCE

EASY DATA MANAGEMENT

REAL – TIME ANALYSIS

MAXIMUM STORAGE EFFICIENCY

KEY FEATURES

- Unprecedented management tools

- Real-time analysis and diagnosis of performance

- All inclusive and integrated data services and protocols

- Active-active cluster option

- Data compression and in-line deduplication

- Optimized storage hierarchy with HSPs containing DRAM, flash cache, and HDDs

- Seamless multiprotocol integration and secure data sharing between Microsoft Windows, Linux, and UNIX environments

KEY BENEFITS

- Reduce complexity- simplified storage management

- No additional software licenses

- High performance and high availability

- Storage efficiency with integrated software

- Scalability in multiple dimensions to adapt to your changing business needs by increasing compute power, storage capacity, or performance independently

- Eco efficiency due to reduced

Oracle's Sun ZFS Storage appliances optimize performance and capacity, minimize downtime, reduce deployment time and cost. Intelligent Hybrid Storage Pools (HSPs), Real – Time Analytics, and unprecedented easy-to-use administration deliver new economic advantages with agile storage management and deployment.

Figure 1: 1Sun ZFS Storage appliances scale multi – dimensionally and are comprised with a full set of all inclusive data services

Meeting Today's IT Challenges

Storage requirements are exploding for databases, virtualization, unstructured content, and data protection (along with more restrictive SLA's).   One of the unique requirements of today's storage applications is that they must provide both high performance and the ability to preserve and manage large volumes of file-based and/or block based data. IT managers are being asked to continuously meet these growing storage capacity needs on flat or declining IT budgets—all while continuing to support high service levels for more and more users.

Sun ZFS Storage Appliances

The Sun ZFS Storage appliances are a family of unified storage systems that offers new innovations in storage, including enterprise-class data services, massive scale, and industry leading performance while delivering significant cost savings. These systems feature a common, easy-to-use management interface that requires no additional training, and have the industry's most comprehensive analytics environment to help isolate and resolve issues to minimize impact to your business. An advanced Hybrid Storage Pool design automatically optimizes performance and helps lower power and cooling requirements, enabling the Sun ZFS Storage Appliances to deliver break-through performance while radically simplifying the way you manage your storage.

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Storage That Is Easy to Deploy, Analyze, and Optimize

Provisioning and management are dramatically simplified in Sun ZFS Storage appliances through the easy-to-use browser user interface (BUI) management that takes the guesswork out of system installation, configuration, and tuning. DTrace Analytics software provides the industry's only comprehensive and intuitive analytics environment.
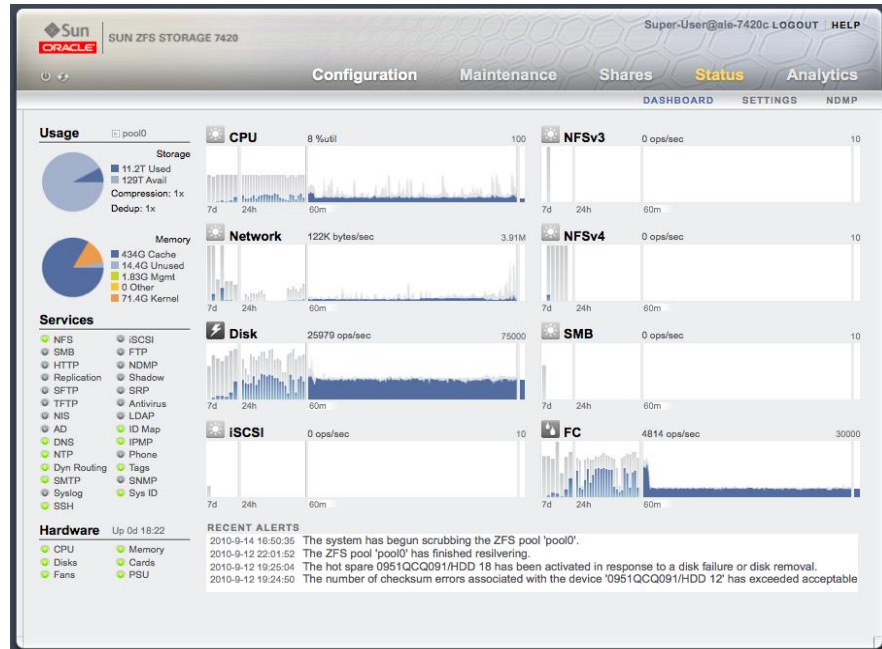

Figure 2: Real – Time Analytics increase storage optimization and reduces down time

Administrators have all of the tools they need to quickly identify and diagnose system performance issues, and debug live storage and networking problems before they become challenging for the entire network. The real-time analysis and monitoring functionality is based on the award-winning DTrace Analytics technology and uses built-in instrumentation to provide in-depth analysis of key storage subsystems. Appliances also include the comprehensive self-healing capabilities of Oracle's Fault Management Architecture (FMA). FMA automatically and silently detects and diagnoses underlying system problems and automatically responds by taking faulty components offline.

Performance and Scalability to Meet Your Business Needs

To deliver high performance using cost-effective components, the Sun ZFS Storage appliance file system, Oracle Solaris ZFS, seamlessly optimizes access to the different types of media as part of the HSPs. Oracle Solaris ZFS was designed to automatically recognize different I/O patterns and place data in the best storage media for optimal performance.

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For example, Oracle Solaris ZFS transparently executes writes to low-latency SSD media so that writes can be quickly acknowledged, allowing the application to continue processing.
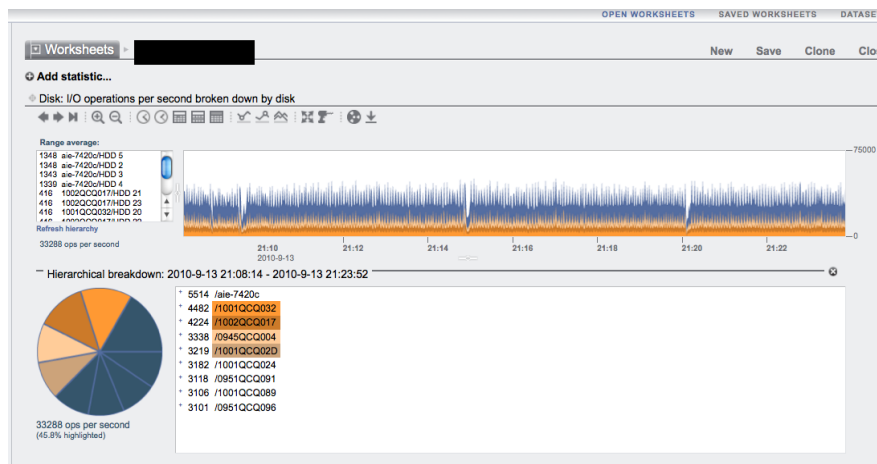

Figure 3: DTrace Analytics, intuitive and comprehensive for seamless optimization

Oracle Solaris ZFS then automatically flushes the data to high-capacity drives as a background task. Another type of SSD media acts as a cache to reduce read latency, and Oracle Solaris ZFS also transparently manages the process of copying frequently accessed data into this cache to seamlessly satisfy read requests from clients.

Scalability in Multiple Dimensions

Unlike traditional storage architectures, Oracle's Sun ZFS Storage appliances support scalability in multiple dimensions with the ability to scale I/O throughput, processor performance, and total storage capacity to meet your application needs. As application requirements change, IT managers can choose to

• Increase resources by adding more processors, cache, I/O.

• Expand total capacity by adding enterprise-class high capacity disk shelf units

• Increase performance using additional flash

Easy on Your Budget

Oracle's Sun ZFS Storage appliances deliver higher performance at costs lower than traditional storage solutions by using cost-effective components and providing a rich set of built-in software features. While many other vendors charge license fees for protocols and data services such as CIFS, NFS, HTTP, deduplication, and replication, these and other software features are included in the price of the Sun ZFS Storage appliances. No additional software licenses are required. Administrative overhead associated with managing licenses is also avoided. The systems also offer economic value by reducing energy consumption and data center space requirements. Energy efficiency is improved through the use of 7200 RPM drives and flash, both of which require significantly less power to operate than 15K RPM drives.

A Range of Configurations

To meet a variety of customer needs for capacity, price, and performance, the Sun ZFS Storage appliances come in four different configurations plus two cluster configurations that offer maximum availability. All systems come bundled with the same software including data protocols, replication, compression, and DTrace Analytics software for system troubleshooting and performance optimization.

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Sun ZFS Storage 7120

This entry-level, easy-to-install storage appliance is ideal for small and medium businesses, departments, and or remote offices of large corporations. It includes the same feature-rich software as the high-end configurations, and delivers 12 TB to 120 TB of raw capacity using 7200 RPM SAS drives with 96GB Write cache. With the Sun Storage 7120 appliance, customers can acquire easy-to-use enterprise data management functionality at entry-level costs.

Sun ZFS Storage 7320

The Sun ZFS Storage 7320 redefines mid-range storage for the enterprise, with simplified management, performance, efficiency, and seamless expansion to meet your growing needs. It provides a high-availability, entry-level cluster option with scalability up to 192 TB raw capacity, and supports the HSP that can be configured with up to 4 TB of read-cache and optional write-optimized cache for enhanced application performance.

Sun ZFS Storage 7420

This unified storage system gives a competitive advantage to data-intensive businesses, and is uniquely designed for virtualized environments requiring multiple data services, and heterogeneous file sharing. It is available in a single or cluster configuration, offers simplified storage management and over 1 PB of raw capacity for extreme scalability. The Sun ZFS Storage 7420 system also delivers superior performance while reducing energy consumption with its HSP architecture.

Sun ZFS Storage 7720

The Sun ZFS 7720 appliance features ease of deployment, state-of-the-art storage density and cable management. The Sun ZFS Storage 7720 appliance is designed to fulfill the needs for the largest bulk storage and backup requirements and in mid-scale mixed workload environments. This appliance includes the same, all-inclusive data services for simplified storage management and initially scales to 720 TB. All configurations are delivered fully clustered, with starting capacities of 240 TB, and with maximum number of processors and backend I/O. And finally, this unique architecture is not only designed with space efficiency, it also features an energy-saving cooling system to reduce power and cooling costs.

Cluster Configurations

For customers that require maximum protection against downtime, the Sun ZFS Storage 7320 and 7420 systems also support a two-node cluster configuration with no single point of failure. The Sun Storage 7720 ships with cluster configuration by default. The Sun ZFS Storage 7320 and 7420 Cluster Systems feature active-active architecture with no single point of failure that enables high performance and high availability to maximize business productivity.

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Sun ZFS Storage Appliance Software	
Service	**Details**
File system	Oracle Solaris ZFS (128-bit addressability)
File level protocol	NFS v2/v3/v4, CIFS, HTTP, WebDAV, FTP/SFTP/FTPS
Block level protocol	ISCSI, Fibre Channel, iSER, SRP, IP over Infiniband , RDMA over Infinidband
Data compression	Four levels of data compression available
Data Deduplication	Inline, block-level deduplication
Replication	1:N, N:1, manual, scheduled, continuous
Monitoring	DTrace Analytics (for system tuning and debugging); dashboard monitoring for key system performance metrics, plug-in for Oracle Enterprise Manager 10g Grid Controller 1.0
Automated serviceability	"Phone Home" capability with automatic case creation, configurable alerts
RAID	Striping, mirroring, triple-mirroring single-parity RAID, double-parity RAID, triple-parity RAID, wide stripes
Remote management	HTTPS, SSH, SNMP v1/v2c, IPMI
Snapshots	Read only, read/write (clone), restore, Microsoft Volume Shadow Copy Support (VSS)
Directory services	NIS, AD, LDAP
Data security	Checksum data and metadata, antivirus quarantine
Network services	NTP, DHCP, SMTP
Backup	NDMP v3/v4, ZFS NDMP

Sun ZFS Storage Appliance Configurations						
	Key Requirement	**Maximum Storage Capacity**	**Space (Rack Units)**	**Write Optimized Flash**	**Read Optimized Flash**	**Cluster Option**
Sun ZFS Storage 7120	Low-priced entry-level system with all software features	120 TB	2U/controller, 4U/disk shelf	96 GB	N	N
Sun ZFS Storage 7320	Entry-level cluster option for high availability	192 TB	1U/controller, 4U/disk shelf	Up to 288GB	Up to 2TB per controller	Y
Sun ZFS Storage 7420	Best price/performance	1.15 PB	3U/controller, 4U/disk shelf	Up to 1.7TB	Up to 2TB per controller	Y
Sun ZFS Storage 7720	High capacity and data growth rates	720 TB	45U/rack	Up to 432GB per rack	Up to 2TB per controller	Standard

Sun ZFS Storage Appliance Specifications				
	7120	**7320**	**7420**	**7720**
Architecture				
Processor	1x 4-core 2.4 GHz Intel® Xeon® Processor	2x 4-core 2.4 GHz Intel® Xeon® Processor, per controller	Up to 4x 6-core 1.86 GHz or 8-core 2.0GHz Intel® Xeon® Processors per controller	4x 8-core 2.26 GHz Intel® Xeon® Processors per controller

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Main memory	24 GB	Up to 72 GB per controller	Up to 512 GB per controller	Up to 512 GB per controller
Base Configurations				
Configuration options	• 12 TB to 120 TB using high capacity SAS-2 7200 rpm disks • Base system: 12 TB (12x1TB) or 24TB (12x2 TB) • Supports up to 2 additional disk shelves with 24 disks each (1 TB or 2 TB)	• 20TB to 192 TB using high capacity SAS-2 7200 RPM disks • Supports up to 4 disk shelves with 24 disks each (1 TB or 2 TB) and optional Write optimized SSD	• 20TB to 1.15 PB using high capacity SAS-2 7200 RPM disks • Supports up to 24 disk shelves with 24 disks each (1 TB or 2 TB) and optional Write optimized SSD	• Up to 720 TB with (360) 2 TB SAS-2 7200 rpm disks • Upgrade with disk shelves containing (30) 2 TB SAS-2 disk, (2) LCC and optional (2) Write Optimized SSD
Standard and Optional Interfaces				
Integrated network	Four 10/100/1000 Base-T Ethernet ports			
Optional network connectivity	Quad Gigabit Ethernet UTP; Dual 10 GigE, QDR Infiniband HCA, 8Gb FC HBA			
Optional tape backup HBA	Dual channel 8Gb FC HBA			
Maximum ports per controller				
1GbE/10GbE/IB/FC	12/2/2/4 (single or cluster)	12/4/4/4 (Single) 8/2/2/2 (Cluster)	28/12/12/12 (single or cluster)	24/8/8/12 (cluster)
Environmental				
Non-operating temperature/humidity (standalone, non-rack system)	-40°C to 70°C (-40°F to 158°F), up to 93% relative humidity, non condensing			5 to 50 C/32 to 122F 8 to 80% relative humidity, non condensing
Altitude (operating)	Up to 3000m, temperature is derated by 1C per 300m of elevation above 900m			
Power Consumption	1,200 W (full controller)	760 W (full controller)	1,485 W (full controller)	7,500 W (full system)
Regulations (Meets or Exceeds the Following Requirements)				
Safety	UL 60950-1 2nd Ed, EN60950-1:2006 2nd Ed, CB Scheme with all country differences	UL 60950-1 2nd Ed, EN60950-1:2006 2nd Ed, CB Scheme with all country differences\	IEC 60950, UL/CSA 60950, EN60950, CB Scheme with all country differences	IEC 60950, UL/CSA 60950, EN60950, CB Scheme with all country differences
RFI/EMI	FCC CFR 47 Part 15 Class A, EN 55022 Class A, EN 61000-3-2, EN 61000-3-3, EN 300-386			FCC CFR 47 Part 15 Class A, EN 55022 Class A, EN 61000-3-2, EN 61000-3-3
Immunity	EN55024:1998+A1:2001:+A2:2003			EN55024
Physical Dimensions				
Height	87.12 mm (3.43 in.)	43.43 mm (1.71 in.)	129.85 mm (5.1 in)	2,019 mm (79.5 in)
Width	425.45 mm (16.75 in.)	425.5 mm (16.75 in.)	436.5 mm (17.2 in.)	569.9 mm (23.5 in)
Depth	762.0 mm (30.0 in.)	685.8 mm (30.0 in.)	732 mm (28.8 in.)	1168.4 mm (46 in)
Weight	29.54 kg (65 lbs.)	16.36 kg (36 lbs)	38.5 kg (85 lbs) max	870 kg (1900 lbs)
Disk Shelf SAS-2				
Power consumption	444W		N	
H x W x D	6.88 in. x 17.52 in. x 23.39 in. (174.8 mm x 445.0 mm x 594 mm)		N	
Weight (max, all drives)	110.23 lb. (50 kg)		N	

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