Oracle ZFS Storage

Frequently Asked Questions

OVERVIEW

The Oracle ZFS Storage Appliance family delivers enterprise-class data services, file- and block-level support, scale, and performance. These systems have the industry's most comprehensive analytics environment provided by the DTrace Analytics feature, an innovative real-time instrumentation tool that helps isolate and resolve issues to minimize impact to your business. These systems are built on an innovative Hybrid Storage Pool architecture, another feature of Oracle ZFS Storage Appliance, which automatically optimizes performance by managing tiering among dynamic random access memory (DRAM), flash, and disk—consolidating systems and lowering your power and cooling requirements.

Two controller configurations are available in the Oracle ZFS Storage Appliance family:

- **ZFS Storage ZS7-2 High-End Appliance** - For the most performance-intensive enterprise environments. Each controller comes with 2x24-core processors and 1.5TB DRAM. The high-availability cluster configuration features 96 CPU cores and 3TB of DRAM.

- **ZFS Storage ZS7-2 Mid-Range** - Each controller comes with 2x18-core processors for a total of 36 CPU cores, and 512GB DRAM. The 2-node high-availability configuration offers 72 CPU cores and 1TB of DRAM. Customers have an option to upgrade the DRAM to 1TB per controller.

Both models use the same intelligent storage OS and enterprise SAS disk enclosure, but feature different storage controllers to meet the appropriate level of performance required for particular environments.

Refer to the NAS Storage page for more information.

CUSTOMER BENEFITS

Optimized for Oracle Applications

Oracle's premier application-engineered storage for multiprotocol environments delivers extreme performance, superior efficiency, and deep Oracle integration.

Oracle ZFS Storage Appliance is designed to run applications fast and efficiently, increase business and IT productivity, save valuable resources, and reduce risk—lowering total cost of ownership. Furthermore, co-development with Oracle Database maximizes your return on Oracle software investments.

Easy to Deploy, Analyze, and Optimize

Provisioning and management are dramatically simplified in Oracle ZFS Storage Appliance with an easy-to-use management interface that requires no additional training and takes the guesswork out of system installation, configuration, and tuning. DTrace Analytics is an intuitive analytical environment that provides storage administrators with the tools to optimize the configuration of their storage system and maximize performance to address their application requirements.

Rapidly Diagnose, Troubleshoot, and Resolve Issues

DTrace Analytics provides real-time analysis of Oracle ZFS Storage Appliance and of the enterprise network, from the storage system to the clients accessing the data. This unprecedented capability permits administrators to quickly find and troubleshoot issues affecting system performance, minimizing impact to business productivity. The data can be saved for further analysis to better understand network, application, and system behavior.

ORACLE

FREQUENTLY ASKED QUESTIONS

Hardware

Q: What are the primary hardware differences between the ZS7-2 High-End and ZS7-2 Mid-Range Appliances?

A: The ZS7-2 High-End includes 4x24 Intel Xeon processors with a maximum of 4 SAS-3 HBAs. The ZS7-2 Mid-Range appliances includes 4x18 Intel Xeon processors with a maximum of 2 SAS-3 HBAs.

Q: Is there a required OS release for the ZS7-2 platform?

A: Yes, the OS8.8 release is required and is also supported on earlier platforms.

Q: Does the ZS7-2 platform support the DE2 disk shelf?

A: Yes, starting with OS8.8.4 and OS8.7 versions and you must ensure the appropriate cabling. Contact support for details.

Q: What is the maximum raw capacity of the ZS7-2 High-End system?

A: Maximum number of storage shelves is 48 providing the following scalability:

- HDD configuration – 24TB to 16PB
- SDD configuration – 153TB to 8.8PB

Q: What RAID levels are supported on Oracle ZFS Storage Appliance?

A: See the latest information in the data sheet.

Q: Can I configure Oracle ZFS Storage Appliance with both high-speed and high-capacity drives?

A: Yes, as long as the high-speed drives and high-capacity drives are in separate disk shelves and separate storage pools, a given Oracle ZFS Storage Appliance controller can manage both types of drives. It is also recommended, if possible, to put drives of different speeds into separate SAS fabrics.

Performance

Q: When should I select 10,000 RPM drive configurations versus 7,200 RPM configurations?

A: The technology of Oracle ZFS Storage Appliance's Hybrid Storage Pool feature manages storage across DRAM, flash, and disk media in order to optimize performance. This means that systems with 7,200 RPM drive configurations can perform extremely fast. Also, 7,200 RPM drives use less power, cost less on a per-GB basis, and consume less floor space on a per-GB basis. Thus, 7,200 RPM drives are recommended for the majority of situations. However, 10,000 RPM drives also are available if you require the absolute maximum I/O performance in certain use cases involving rapid I/O operations for random, uncached data such as virtualization, mixed environments, OLTP, and e-mail storage.

Q: What are the performance characteristics of the Oracle ZFS Storage Appliance?

A: See the SPEC SFS2014 published results.

Key Benefits

Q: What are the key features and benefits of Oracle ZFS Storage Appliance?

A: The Oracle ZFS Storage Appliance systems provide several key storage technologies that set them apart from other appliances in the market. Please refer to the product web page and data sheet for details.

Software and Data Services

Q: What's different about the Oracle ZFS Storage Appliance deduplication compared to other storage systems offering deduplication?

A: Deduplication occurs inline on Oracle ZFS Storage Appliance, which means data is deduplicated as its being written. Deduplication performance is accelerated by requiring two deduplication metadevices SSDs for every four trays. Deduplication can be combined with LZ4 compression for optimal data reduction. The best use case for Oracle ZFS storage deduplication is traditional full (level 0) backups.

Q: How does the snapshot capability work within Oracle ZFS Storage Appliance?

A: A snapshot is a read-only copy of a file system or volume. Snapshots can be created almost instantly, and initially consume no additional disk space within the pool. However, as data within the active data set changes, the snapshot consumes disk space by continuing to reference the old data and so prevents the space from being freed.

ZFS snapshots include the following features:

- They persist across system reboots.
- Snapshots consume disk space directly from the same storage pool as the file system from which they were created.

- Recursive snapshots are created quickly as one atomic operation. The snapshots are created together (all at once) or not created at all.

- The benefit of atomic snapshot operations is a crash consistent snapshot that is always taken at a consistent time, even across descendent file systems.

- Snapshots of volumes cannot be accessed directly, but they can be cloned, backed up, rolled back to, and so on.

Q: Can a LUN or share be restored to a state from a previous point in time?

A: Yes, you can restore a share or LUN snapshot to any previous point in time. Snapshots can be taken manually or scheduled to occur on an ongoing basis.

Q: Can shares or LUNs be expanded after initial creation?

A: Yes, you can add new disks to an existing pool, and then the existing shares and LUNs in that pool are able to use the additional capacity.

Q: Is user quota management possible on an appliance?

A: Yes, you can assign quotas to individual users or to groups. This can be accomplished via the browser-based user interface (BUI), via the command-line interface (CLI), or via workflows.

Q: Do the software features of Oracle ZFS Storage Appliance need to be ordered separately?

A: With the exception of the Oracle ZFS Storage Appliance Replication feature, Oracle ZFS Storage Appliance encryption capability, and Oracle ZFS Storage Appliance Cloning feature, all other features are included with the price of Oracle ZFS Storage Appliance.

Networking
Q: What networking options and protocols are available?

Q: Networking options include 25GbE, 40GbE, 10GbE Base-T, 10GbE Optical, QDR InfiniBand HCA, and 32Gb FC HBA. For more details including supported protocols, see the data sheet.

Q: Are both VLANs and link aggregation supported?

A: Yes, VLANs (IEEE 802.1Q) and LACP (IEEE 802.3ad) are supported.

Security
Q: How secure is Oracle ZFS Storage Appliance encryption?

A: Highly secure. It's based on a high-availability two-tier Advanced Encryption Standard (AES) 128/192/256-bit encryption architecture. The first tier encrypts the data stored on an appliance, and the second tier encrypts those encryption keys with another encryption layer called the key wrapper keys, which are stored in the key store of the key manager. AES 256-bit encryption is the most secure encryption available.

Q: Do I have to encrypt the whole storage system or can I encrypt just certain volumes?

A: You can encrypt an entire storage pool, certain volumes, such as projects shares, or LUNs. This flexibility allows you to better manage your sensitive and nonsensitive data within the same storage systems with better granularity, security, and controls. You can find more information on Oracle ZFS Storage Appliance Encryption in these blogs: "ZFS Data Encryption...Secure, Flexible, and Cost-Effective" and "Data Encryption...Software vs Hardware."

Q: What's the key management system for Oracle ZFS Storage Appliance encryption?

A: You can use local ZFS key management or centralized key management, such Oracle Key Manager.

Q: What ZFS storage systems use Oracle ZFS Storage Appliance encryption?

A: The Oracle ZFS Storage Appliance encryption capability is supported starting with the Oracle ZFS Storage ZS3-4 up to the Oracle ZFS Storage ZS7-2. Use the latest OS version for best results.

Q: How is Oracle ZFS Storage Appliance encryption licensed?

A: One license per ZFS controller. This license also includes integrated local key management.

Data Migration and Replication
Q: Are data migration services and tools available to assist my move to Oracle ZFS Storage Appliance?

A: Yes, there are two options. Using the Shadow Migration feature included with Oracle ZFS Storage Appliance, you can migrate your own data from any NFS system (EMC, NetApp, and so on). Alternatively, Oracle is able to assist you with custom migration. Call 1-800-Oracle1 or contact your Oracle sales representative for more information.

Q: How do I do remote replication with Oracle ZFS Storage Appliance?

A: Oracle ZFS Storage Appliance offers snapshot-based asynchronous replication software with its intelligent

replication compression feature that dynamically autotunes itself to changing network speeds and system workloads for optimum efficiency and performance, which increases effective throughput and reduces WAN costs.

It is capacity-independent and licensed per active ZFS controller.

Q: How can I "seed" or do my first full replica offline to save time and WAN costs?

A: Oracle ZFS Storage Appliance allows you to do it two ways. You can do a copy to another Oracle ZFS Storage Appliance locally, and then ship that appliance to a remote site, or you can do a replication "offline" to an existing remote site by using an NFS server (or disk set) as a physical transport medium. Incremental replications can then be done over the WAN.

Oracle Database Integration

Q: Is there a licensing requirement to store data compressed by Oracle's Hybrid Columnar Compression, a feature of Oracle Database in Oracle ZFS Storage Appliance?

A: There is no need to license the advanced compression option, nor is there anything extra to license on Oracle ZFS Storage Appliance. You must be running Oracle Database 11.2.0.3, or later, Enterprise Edition in order to use Hybrid Columnar Compression, the feature of Oracle Database.

Q: Is there a way to estimate the storage savings for Oracle's Hybrid Columnar Compression, a feature of Oracle Database?

A: Yes, Oracle's Compression Advisor feature, which is included in Oracle Database 11*g* Release 2, can be used to estimate storage savings resulting from Oracle's Hybrid Columnar Compression. Note that the version of Compression Advisor that is available for download from Oracle Technology Network is **not** able to estimate storage savings resulting from Oracle's Hybrid Columnar Compression. It can be used only to estimate storage savings for OLTP table compression and BASIC table compression.

Q: Is there a specific Oracle ZFS Storage Appliance software version to support Oracle's Hybrid Columnar Compression?

A: No, but it is recommended that the latest offering be installed.

Q: Where can users download the Oracle ZFS Storage Appliance software and the available?

A: Visit this download page.

Q: Can Oracle Enterprise Manager be used to monitor Oracle ZFS Storage Appliance?

A: Yes, the Oracle Enterprise Manager Plug-in for Oracle ZFS Storage Appliance connects Oracle ZFS Storage Appliance with Oracle Enterprise Manager to allow for n-way views of all appliances in the infrastructure.

Q: Do I also need Oracle Enterprise Manager Ops Center to monitor Oracle ZFS Storage Appliance?

A: No. While there is support for Oracle ZFS Storage Appliance in Oracle Enterprise Manager Ops Center, it is optional management software that is available for streamlining multisystem management.

Q: How does Oracle Enterprise Manager enable self-service storage?

A: The plugin now provides the ability to provision file systems and LUNs on Oracle ZFS Storage Appliance through Oracle Enterprise Manager. The storage administrator also can allow users to access this capability with their own logins to provision a project they have permissions to edit. Therefore, the storage administrator can create a project, assign a user and role with limited rights to the project, and share these permissions with users to allow them to self-administer their allocated storage through Oracle Enterprise Manager.

Q: Where can I find documentation for Oracle Enterprise Manager Plug-in for Oracle ZFS Storage Appliance?

A: Documentation can be found online.

Q: Does the plugin work with all types of storage?

A: No. This plugin is for Oracle ZFS Storage Appliance only. Other storage devices need their own plugin to integrate with Oracle Enterprise Manager.

Q: What is the cost of Oracle Enterprise Manager Plug-in for Oracle ZFS Storage Appliance?

A: There is no additional cost for the plugin. The software is available for download for any registered oracle.com user.

Q: Does Oracle ZFS Storage Appliance have a programming API?

A: Oracle ZFS Storage Appliance supports a full-featured RESTful management API, which is ideal for public and private cloud orchestration.

Media and Entertainment

Q: What benefits does Oracle ZFS Storage Appliance present for media and entertainment customers?

A: From ingestion, postproduction, supporting massive render farms, and broadcasting to archiving rich media assets, Oracle ZFS Storage Appliance presents compelling technical advantages at an attractive price point for media and entertainment customers by providing Hybrid Storage Pool technology for high streaming performance, a massive number of CPU cores with a symmetric multiprocessing OS for large render farm support, and adjustable record sizes for efficiently handling large 2 K and 4 K media files.

Q: Where can I learn more about how Oracle ZFS Storage Appliance is ideally suited for media and entertainment workloads?

A: Download the solution brief about Oracle ZFS Storage Appliance for media and entertainment workloads.

Oracle Cloud Integration

Q: Does Oracle ZFS Storage Appliance integrate with Oracle's Cloud for storing data?

A: Yes, OS8.8 includes a cloud snapshot feature that allows you to migrate data to OCI's object storage. You can migrate both full and incremental cloud snapshot backups to both the standard or archive tiers. For more information, see Configuring Cloud Backup.

Specifications and Documentation

Q: What are the specifications, including environmental?

A: Please refer to the data sheet.

Q: Where can I find the official end-user documentation for Oracle ZFS Storage Appliance?

A: You can find it on the documentation web page.

Q: Where can I find more information about Oracle ZFS Storage Appliance?

A: You can contact your Oracle sales representative directly or call 1-800-Oracle1. For more information about Oracle ZFS Storage Appliance, visit this web page.

Q: Are any customer training courses available?

A: Yes, training is available through Oracle University. Contact your Oracle sales representative directly or call 1-800-Oracle1 for information.

Q: Is there a way to try out the Oracle ZFS Storage Appliance features without having to buy a system?

A: Yes, you can get a feel for the appliance features and BUI by downloading the simulator.

Q: Where can I learn more about use cases involving Oracle ZFS Storage Appliance?

A: Use this link and scroll down to the Solutions section.

Product Warranty, Sales and Support

Q: What is the hardware warranty?

A: The hardware warranty is one year with second business day hardware service response. See the complete terms.

As with all product warranties, this warranty is designed to offer consumers basic recourse if a product defect is discovered. For more complete support, you should purchase the recommended support coverage at the point of product purchase to gain access to the services and resources you need and to avoid potential reinstatement fees down the road.

Q: What is the recommended support for Oracle ZFS Storage Appliance systems?

A: For all storage systems being used in critical production and test environments, Oracle recommends Oracle Premier Support for Systems. This service provides the support, firmware updates, and proactive support tools you need to work efficiently, to minimize business risk, and to get the most from your investment. Features include access to 24/7 support and online resources as well as 24/7 hardware service coverage with rapid onsite response. For more information on Oracle Premier Support for Systems, visit this web page.

Q: How do I purchase this product?

A: Contact your Oracle sales representative or an authorized Oracle partner.

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