

Oracle ZFS Storage Appliance Racked System



Oracle ZFS Storage Appliance Racked System—a fully tested, assembled, and integrated storage system that comes with Oracle Platinum Services—lowers TCO while reducing risk. This preconfigured, racked storage system dramatically shortens deployment time while optimizing performance and availability. Additionally, Oracle Platinum Services ensures maximum uptime and rapid resolution with 24/7 remote fault monitoring, industry-leading response times, and patch deployment services. Oracle ZFS Storage Appliance Racked System is designed to run applications faster and more efficiently, providing a ready-to-deploy optimal storage architecture for enterprise clouds and virtualization, whether for on-premises private clouds, hybrid clouds, or cloud service providers. Codeveloped with Oracle Database, Oracle ZFS Storage Appliance Racked System maximizes the return on your Oracle software investment. This racked system is ideal as storage expansion for Oracle Exadata, Oracle SuperCluster, and other Oracle engineered systems and cloud applications.



Performance, Efficiency, and Oracle Coengineering

Oracle ZFS Storage Appliance Racked System is a complete, integrated, and fully configured storage system based on an advanced hardware and software architecture specifically aimed at high performance, security, and efficiency. Additionally, it is the only network-attached storage system coengineered with Oracle software to deliver unmatched advantages in Oracle software environments.

Highlights include the following:

- Superior performance and efficiency
- Deep integration with Oracle Database
- Enhanced serviceability

To learn more about the advantages of Oracle ZFS Storage Appliance, view the [product website](#).

Accelerate Implementation Success

Oracle ZFS Storage Appliance Racked System expedites the ROI on its superior advantages by speeding deployment and removing implementation guesswork.

KEY FEATURES

- Fully tested, assembled, and integrated storage
- Unparalleled integration with Oracle Database
- Optimal storage architecture for enterprise clouds and virtualization
- Dynamic caching among dynamic random access memory (DRAM), flash cache, and disk drives
- Efficient and economical inline data services including compression, cloning, encryption, and replication
- Advanced, intuitive management and granular analytics tools
- Granular data security with advanced AES encryption

KEY BENEFITS

- Shortens deployment time dramatically
- Maximizes return on Oracle software investments
- Provides extreme performance
- Reduces the risk and cost of security breaches
- Operates with high availability

By receiving a racked and configured system, you leverage the best practices from Oracle engineering and support teams to ensure that a fully optimized system arrives at your door, ready to turn on. And, you receive the highest performance while maintaining the highest level of data availability.

Hardware Architecture and Configuration

Oracle ZFS Storage Appliance Racked System is based upon three primary components:

- **Software:** A unique, intelligent symmetric multiprocessing (SMP) storage OS with enterprise-class data services, robust data protection, and Hybrid Storage Pool technology (a feature of Oracle ZFS Storage Appliance) manages the dynamic caching.
- **Data services:** Analytics, replication, cloning, and encryption software are included in the base system.
- **Highly available configuration:** Each Oracle ZFS Storage Appliance Racked System is configured with two Oracle ZFS Storage ZS5 controllers that provide a high-end enterprise multiprotocol storage system—at a price point that rivals competitive high-end systems—for workloads demanding high availability (HA) with rapid failover, extreme performance, and scalability.
- **Storage:** Enterprise-grade disk enclosures contain SAS hard disk drives (HDDs) and write flash accelerators for high-performance, HA persistent storage. There are a minimum of two and a maximum of eight high-capacity disk enclosures per single rack. Oracle ZFS Storage Appliance expansion rack provides multitrack storage expansion capabilities that enable configurations with over 7 PB in total capacity.

Optional Software

Oracle Snap Management Utility for Oracle Database, a feature of Oracle ZFS Storage Appliance, is a standalone management tool engineered to work with Oracle ZFS Storage Appliance Racked System. It provides a fast, efficient, and automatic way to backup, restore, clone, and provision Oracle Database when one or more databases are stored on Oracle ZFS Storage Appliance Racked System.

HARDWARE SPECIFICATIONS**Oracle ZFS Storage Appliance Racked System**

Architecture	Dual-controller HA cluster with disk storage enclosures
Processors	<ul style="list-style-type: none"> • Oracle ZFS Storage Appliance Racked System ZS5-4: 8x 18-core 2.6 GHz processors • Oracle ZFS Storage Appliance Racked System ZS5-2: 4x 18-core 2.3 GHz processors
DRAM cache	<ul style="list-style-type: none"> • Oracle ZFS Storage Appliance Racked System ZS5-4: 3 TB • Oracle ZFS Storage Appliance Racked System ZS5-2: 1.5 TB
Read flash cache	<ul style="list-style-type: none"> • Oracle ZFS Storage Appliance Racked System ZS5-4: up to 243 TB • Oracle ZFS Storage Appliance Racked System ZS5-2: up to 102 TB

Storage Configurations

Configuration options	<ul style="list-style-type: none"> Oracle ZFS Storage Appliance Racked System ZS5-4: 322 TB to 7.3 PB scalability Oracle ZFS Storage Appliance Racked System ZS5-2: 322 TB to 3 PB scalability Choice of 20 or 24 HDD disk shelf types With 20 HDDs per disk shelf, choice of two or four Read or Write SSD accelerators per disk shelf ZFS Storage Appliance Racked System ZS5-4: 2 –38 disk shelves can be attached for storage ZFS Storage Appliance Racked System ZS5-2: 2 –16 disk shelves can be attached for storage
Disk shelf/HDD options	<ul style="list-style-type: none"> Oracle Storage Drive Enclosure DE3-24C: 8 TB, SAS-3, 3.5-inch 7,200 RPM HDDs Oracle Storage Drive Enclosure DE3-24P field upgrade option

Standard and Optional Interfaces

Integrated network	8x 10 GbE Base-T Ethernet ports
Optional network connectivity	10 GbE, QDR InfiniBand HCA, 16 Gb FC HBA
Optional tape backup HBA	Dual-channel 16 Gb FC HBA

Maximum Ports per System

10 GbE Base-T/10 GbE Optical/InfiniBand/16 Gb FC	<ul style="list-style-type: none"> Oracle ZFS Storage Appliance Racked System ZS5-4: 48/24/16/16 Oracle ZFS Storage Appliance Racked System ZS5-2: 16/8/8/8
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Environmental

Nonoperating temperature/humidity	-40°C to 70°C (-40°F to 158°F), up to 93% relative humidity, noncondensing
Altitude (operating)	Up to 3,000 m; temperature is derated by 1°C per 300 m of elevation above 900 m

Regulations (meets or exceeds the following requirements)

Safety	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
Immunity	EN55024:1998+A1:2001:+A2:2003

POWER AND THERMAL

Item Description		Typical	Maximum
Oracle ZFS Storage Appliance Racked System	Power (W)	5,097 W	7,110 W
Oracle Storage Drive Enclosure DE3-24C	Power (W)		
Oracle Storage Drive Enclosure DE3-24C	Thermal (BTU/hr.)	469 W	699 W
		1,600 BTU/hr.	2,385 BTU/hr.

Oracle ZFS Storage Appliance Racked System

Oracle ZFS Storage Appliance Racked System Oracle ZFS Storage ZS5-4 (controller only)	Height	1,998 mm (78.66 in.) 42R (rack units)
	Width	600 mm (23.62 in.)
	Depth	1,200 mm (47.24 in.)
	Weight	630 kg (1,389 lb.)
Oracle ZFS Storage ZS5-4 (controller only) Oracle Storage Drive Enclosure DE3-24C (fully loaded with drives)	Height	129.85 mm (5.1 in.) 3R (rack units)
	Width	436.5 mm (17.2 in.)
	Depth	732 mm (28.8 in.)
	Weight	38.5 kg (85 lb.) max.
Oracle Storage Drive Enclosure DE3-24C (fully loaded with drives)	Height	175 mm (6.89 in.) 4R (rack units)
	Width	483 mm (19 in.)
	Depth	630 mm (24.8 in.)
	Weight	46 kg (101.41 lb.)

ORACLE ZFS STORAGE APPLIANCE RACKED SYSTEM SOFTWARE

Included Features	Details
Oracle Intelligent Storage Protocol, a feature of Oracle ZFS Storage Appliance	Oracle Database 12c sends metadata to Oracle ZFS Storage Appliance Racked System about each I/O operation, enabling the appliance to dynamically tune itself for optimal performance. This provides visibility at the database and per-pluggable-database level for actionable insight.
File system	Oracle Solaris ZFS (128-bit addressability)
File-level protocol	NFS v2/v3/v4, SMB1/2/2.1, HTTP, WebDAV, FTP/SFTP/FTPS
Block-level protocol	ISCSI, Fibre Channel, iSER, SRP, IP over InfiniBand, RDMA over InfiniBand
Data compression	Four distinct compression options to balance data reduction with performance for specific workloads
Hybrid Columnar Compression, a feature of Oracle Database	3x to 5x reduction in storage footprint with existing instances of Oracle Database for OLTP, data warehousing, or mixed workloads
Data deduplication	Inline, block-level deduplication
Monitoring/real-time analytics	DTrace Analytics (a feature of Oracle ZFS Storage Appliance) for system tuning and debugging, and dashboard monitoring for key system performance metrics; plugin available for Oracle Enterprise Manager
Automated serviceability	"Phone home" capability with automatic case creation and 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, RESTful API, OpenStack Cinder
Snapshots	Read-only, restore, Microsoft Volume Shadow Copy Service support
Directory services	NIS, AD, LDAP
Data security	Checksum data and metadata, antivirus quarantine
Network services	NTP, DHCP, SMTP
Backup	NDMP v3/v4, ZFS NDMP
Local replication	Replication within same Oracle ZFS Storage Appliance Racked System configuration
Clones	Writable snapshots
Remote replication	<ul style="list-style-type: none"> Replication from one Oracle ZFS Storage Appliance Racked System to another 1:N, N:1, manual, scheduled, or continuous
Encryption	Highly secure, easy-to-implement two-level AES 256/192/128-bit granular data encryption at project/share/LUN level and key management flexibility for data breach protection and security
Optional Software	
Oracle Snap Management Utility for Oracle Database	Fast, efficient, and automatic way to backup, restore, clone, and provision Oracle Database when one or more databases are stored on Oracle ZFS Storage Appliance Racked System

Oracle Support

Oracle Premier Support services provide the complete system support you need to proactively manage your Oracle storage systems, with swift resolution and rapid-response hardware service when problems do arise, keeping your business information available 24/7.

Oracle Platinum Services provide an enhanced level of service for supported configurations of Oracle ZFS Storage Appliance Racked System. Oracle Platinum Services are available for Oracle ZFS Storage Appliance Racked System ZS5-4 and Oracle ZFS Storage Appliance Racked System ZS5-2 when they are attached to Oracle Exadata, Oracle SuperCluster, or Oracle Exalogic.

With Oracle Advanced Customer Support services, you get mission-critical support with a focused support team, proactive guidance to tailor storage systems for optimal performance and increased competitiveness, and preventative monitoring to help you achieve HA and optimized system performance.

For more information about Oracle Support and Oracle Advanced Customer Support services, please speak with your Oracle representative or Oracle authorized partner, or visit www.oracle.com/support or www.oracle.com/acs.

Oracle's Upgrade Advantage Program

The upgrade advantage program (UAP) is a trade-in program that offers upfront discounts on new Oracle systems for the trade-in of older Oracle and competitors' eligible systems. Oracle also provides free return shipping and free state-of-the-art recycling of the old systems so you don't need to worry about the disposal of hazardous waste.

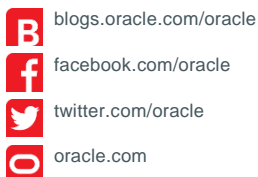
For more information about the UAP, go to www.oracle.com/us/products/servers-storage/upgrade-advantage-program/index.html.



CONTACT US

For more information about Oracle ZFS Storage Appliance Racked System, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

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