

Oracle Solaris 10 ZFS and Data Management Frequently Asked Questions (FAQ)

Last updated 02/08/2013

1-What is Oracle Solaris ZFS?

Oracle Solaris ZFS is a general-purpose file system designed to meet the modern needs of a general-purpose, host-based file system. Oracle Solaris ZFS and Oracle's industry-standard storage servers offer a compelling open storage solution over proprietary storage offerings.

- **Simple pooled storage model**—ZFS aggregates devices into a storage pool that describes the physical characteristics of the storage (device layout, data redundancy, and so on) and acts as an arbitrary data store from which file systems can be created. File systems are no longer constrained to individual devices, which allows them to share disk space with all file systems in the pool. You no longer need to predetermine the size of a file system, because file systems grow automatically within the disk space allocated to the storage pool. When new storage is added, all file systems within the pool can immediately use the additional disk space without additional work.
- **Checksums and self-healing data**—All ZFS data and metadata is protected and verified by using a user-selectable checksum algorithm. In addition, ZFS provides for self-healing data. ZFS supports storage pools with varying levels of data redundancy. When a bad data block is detected, ZFS fetches the correct data from a redundant copy and repairs the bad data, replacing it with the correct data.
- **Immense scalability**—Oracle Solaris ZFS is a 128-bit file system, designed to provide 16 billion billion times greater capacity than currently available 32-bit and 64-bit file systems.

2-How does Oracle Solaris 10 address data management requirements?

The Oracle Solaris 10 OS currently integrates key data management technologies, such as the ground-breaking Oracle Solaris ZFS file system, NFS, UFS, and the Oracle Solaris Volume Manager software.

- Oracle Solaris ZFS file systems are significantly easier to configure and deploy. Oracle Solaris ZFS is designed from the ground up to automate common administrative tasks, protect data from corruption, and provide virtually unlimited scalability. Oracle Solaris ZFS uses virtual storage pools to make it easy to expand file systems simply by adding more drives.
- NFS is the premier industry standard for file sharing between computers. NFSv4 software in Oracle Solaris 10 provides traditional file access with the addition of strong security features, improved access and performance on the internet, and enhanced cross-platform interoperability.
- UFS is integrated with Oracle Solaris and provides a legacy general-purpose file system. It is suitable for a wide variety of applications and is tailored for handling small, cacheable files accessed randomly by individual processes. UFS most commonly handles workloads such as software development and network services.

Oracle Solaris 10 ZFS and Data Management Frequently Asked Questions (FAQ)

- Oracle Solaris Volume Manager software is a robust disk and storage management solution suitable for enterprise-class deployment. This volume manager pools UFS components into volumes and allocates them to applications, supplying redundancy and failover capabilities that can help provide continuous data access even in the event of a device failure. With an easy-to-use interface, the software greatly simplifies storage administration and allows many operations, such as recovering volumes or expanding the size of a file system, to occur online, minimizing the need for costly downtime.

3-How easy is it to manage Oracle Solaris ZFS?

Administering storage with Oracle Solaris ZFS is extremely easy. ZFS eliminates volume management altogether. Instead of forcing you to create virtualized volumes, ZFS aggregates devices into a storage pool. For example, space within the storage pool is dynamically allocated to file systems in the pool, so there's no need to statically partition storage into slices, volumes, and file systems. ZFS pools and file systems are primarily managed with two simple commands. Most operations, including adding or replacing devices, are completed while the pools are online and the data is available.

4-How reliable is Oracle Solaris ZFS?

All operations are transactional, so related changes succeed or fail as a whole and all data is protected by 256-bit checksums. When any data is read, the checksum is verified to ensure that the data the application wrote is what it gets back. If a checksum error is detected in a mirrored pool, the correct data is read from the other side of the mirror and the corrupt data is repaired. ZFS also checks data at rest. Most file systems check data only when it is accessed by system or user processes. ZFS periodically checks all data to prevent the very real problem of data corruption or *bit rot*, which was explored by a CERN study in 2007.

5-What changes do I need to make to my applications to take advantage of Oracle Solaris ZFS?

Because Oracle Solaris ZFS is a Portable Operating System Interface (POSIX) file system, there is no need to make changes to applications.

6-Does Oracle Solaris ZFS work with the Oracle Solaris Cluster software?

Oracle Solaris Cluster supports Oracle Solaris ZFS as a failover file system. Oracle Solaris ZFS and Oracle Solaris Cluster offer a best-in-class file system solution combining high availability, data integrity, performance, and scalability to cover the needs of the most-demanding environments.

7-Is Oracle Solaris ZFS compatible with the Oracle Solaris DTrace feature?

Yes, Oracle Solaris DTrace and Oracle Solaris ZFS are fully compatible. Oracle Solaris developers can use DTrace both as a debugging tool and as an aid to improving performance.

8-Is Oracle Solaris ZFS a replacement for other data management products?

Oracle Solaris ZFS is a next-generation file system that is designed, over time, to replace UFS as well as negate the need for separate volume management software. Oracle Solaris ZFS is available in Oracle Solaris 10, along with the default UFS file system, and it complements special-purpose Oracle Solaris file systems and storage archive software products such as Oracle's Sun QFS shared SAN file system and Oracle's Sun Storage Archive Manager software.

In Oracle Solaris 10, the boot environment can be either ZFS or the legacy UFS. For many reasons—including integration with Oracle Solaris Live Upgrade—the operational superiority of ZFS makes it the best choice for Oracle Solaris 10. For Oracle Solaris 11, the boot environment can only be ZFS.

Oracle Solaris 10 ZFS and Data Management Frequently Asked Questions (FAQ)

9-Can I migrate my UFS root file system to a ZFS root file system?

Yes, in the Oracle Solaris 10 release, you can use Oracle Solaris Live Upgrade to automatically migrate your UFS root file system to a ZFS root file system. Along with Live Upgrade's ZFS migration capability and other great features, the JumpStart and Flash Archive features have been enhanced and updated to support ZFS.

10-How can I get more news about Oracle Solaris?

Catch the latest news and information from our social media sites:

- [Blog](#)
- [Facebook](#)
- [Twitter](#)
- [LinkedIn](#)
- [YouTube](#)

For more information on Oracle Solaris 10, please visit the [Oracle Technology Network Website](#).



Oracle Corporation
Worldwide Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:

Phone: +1.650.506.7000
+1.800.ORACLE1
Fax: +1.650.506.7200

oracle.com



Oracle is committed to developing practices and products that help protect the environment

Copyright © 2013, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 1012

Hardware and Software, Engineered to Work Together