Oracle® Solaris Cluster 4 Compatibility Guide

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Oracle Solaris Cluster 4 Compatibility Guide

Part No: E87540

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Using This Documentation

- **Overview** – Covers Oracle products that are qualified for Oracle Solaris Cluster 4.
- **Audience** – Administrators of Oracle Solaris Cluster.
- **Required knowledge** – Experience in administering distributed systems.

Product Documentation Library

Documentation and resources for this product and related products are available at `http://www.oracle.com/pls/topic/lookup?ctx=product_intuitive_ID`.

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♦ ♦ ♦   **C H A P T E R   1**

What's New in Oracle Solaris Cluster 4.3

This chapter covers the updates to Oracle Solaris Cluster starting with Oracle Solaris Cluster 4.3 SRU 4.

What's New in Oracle Solaris Cluster 4.3 SRU 8

The following sections cover updates to Oracle Solaris Cluster from Oracle Solaris Cluster 4.3 SRU 3 through Oracle Solaris Cluster 4.3 SRU 8.

Hardware Updates to Oracle Solaris Cluster 4.3

Oracle Solaris Cluster has been tested on the following hardware:

- SPARC T7 Series servers
- SPARC M8 Series servers
- SPARC T8 Series servers
- Fujitsu SPARC M12 servers
- Oracle Server X7-2 and Oracle Server X7-2L

Oracle VM Server for SPARC 3.5 Updates Oracle Solaris Cluster 4.3

Oracle VM Server for SPARC runs on Oracle Solaris 11.3 SRU 21. See details in the following tables:

- "Support for Oracle VM Server for SPARC" on page 26
- Table 5, "Oracle VM Server for SPARC on Oracle Solaris Cluster Versions 4.2 to 4.3 Support Matrix," on page 26

- Table 7, "Oracle VM Server for SPARC 3.4x and 3.5.x on SPARC Servers Support Matrix," on page 29
- Table 10, "Data Services for Oracle Solaris Cluster 4.3 on SPARC," on page 38

Data Services Updates for Oracle Solaris Cluster 4.3

Scan the following tables for the latest versions of data services that run on Oracle Solaris Cluster 4.3:

- Table 10, "Data Services for Oracle Solaris Cluster 4.3 on SPARC," on page 38
- Table 11, "Data Services for Oracle Solaris Cluster 4.3 on x64," on page 43
- Table 12, "HA-Oracle 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 47
- Table 13, "HA-Oracle 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 on x64," on page 48
- Table 18, "Oracle RAC 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 SRU 7 and Higher on SPARC," on page 51
- Table 19, "Oracle RAC 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 SRU 7 and Higher on x64," on page 51

Storage Support Updates for Oracle Solaris Cluster 4.3

See the following sections for updates to storage options in Oracle Solaris Cluster 4.3:

- Chapter 10, "Storage on Oracle Solaris Cluster" – Updates and links to supplementary information
- "Configuration Requirements for FC Storage" on page 132
- "InfiniBand Support" on page 162 – Updates about InfiniBand partitions

Geographic Edition Updates for Oracle Solaris Cluster 4.3

See Chapter 8, "Oracle Solaris Cluster Geographic Edition" for updates to the Geographic Edition.

Networking Card Updates for Oracle Solaris Cluster 4.3

See the following sections for new PCIe, HBA, and NICs in Oracle Solaris Cluster 4.3:

- "32Gb HBAs" on page 130
- "Ethernet Network Interfaces on Oracle Solaris Cluster" on page 147 – Updates and links to supplementary information
- "InfiniBand Support" on page 162 – Updates and links to supplementary information

♦ ♦ ♦ **C H A P T E R 2**

2

Software Configuration on Oracle Solaris Cluster

Typically, each node in an Oracle Solaris Cluster will have the Oracle Solaris operating system, Oracle Solaris Cluster software, volume management software, and applications along with their data services and fault monitors running on it.

Oracle Solaris Cluster Releases

All nodes in the cluster are required to run the same version of Oracle Solaris Cluster.

Oracle Solaris Cluster 4 has the following releases. All releases have updates, called SRUs:

- Oracle Solaris Cluster 4.0
- Oracle Solaris Cluster 4.1
- Oracle Solaris Cluster 4.2
- Oracle Solaris Cluster 4.3

`solaris10` Branded Zones in Oracle Solaris Cluster

Oracle Solaris Cluster 4.x `solaris10` branded zones. For support details, see the following:

- "`solaris10` Branded Zone Clusters and Oracle Data Guard" on page 113
- "`solaris10` Branded Zone Clusters and Oracle GoldenGate" on page 114
- "`solaris10` Branded Zone Clusters and MySQL" on page 115
- "`solaris10` Branded Zone Clusters and Availability Suite" on page 116
- "`solaris10` Branded Zone Clusters" on page 116
- "`solaris10` Branded Zone Clusters and ZFS SA Remote Replication" on page 118
- "`solaris10` Branded Zone Clusters and EMC SRDF" on page 120

Note - Oracle Solaris Cluster patch 145333-36 for SPARC and patch 145334-36 for x86 require Java 7.

Oracle Solaris Releases

All nodes in the cluster are required to run the same version of the operating system.

TABLE 1   Oracle Solaris Releases for Oracle Solaris Cluster 4

Supported Oracle Solaris Releases	Oracle Solaris Cluster 4.0	Oracle Solaris Cluster 4.1	Oracle Solaris Cluster 4.2	Oracle Solaris Cluster 4.3
Oracle Solaris 11	Y			
Oracle Solaris 11.1		Y	Y	
Oracle Solaris 11.2		Y, at least Oracle Solaris Cluster 4.1 SRU 8	Y, at least Oracle Solaris 11.2 SRU 13	Y, at least Oracle Solaris 11.2 SRU 13
Oracle Solaris 11.3			Y, at least Oracle Solaris Cluster 4.2 SRU 5[a]	Y

a – If you are installing Oracle Solaris 11.3 SRUs after SRU 1, you should upgrade to Oracle Solaris Cluster 4.3. SRUs released after Oracle Solaris 11.3 SRU 1 could impact Oracle Solaris Cluster and its data services. Later Oracle Solaris 11.3 SRUs were not tested with Oracle Solaris Cluster 4.2.

The minimal supported OS package set is the "solaris-small-server" package group. Starting with Oracle Solaris Cluster 4.3 SRU 4, the "solaris-minimal-server" package group introduced in Oracle Solaris 11.2 may also be used. See Oracle Solaris Cluster and Oracle Solaris OS Minimization Support Required Packages Group (Doc ID 1544605.1) on My Oracle Support for more info.

Application Services on Oracle Solaris Cluster

An application service is an application along with a data service which makes the application highly available or scalable in Oracle Solaris Cluster.

All Oracle Solaris Cluster 4 data services are supported in the global zone. Many data services are supported with the Oracle Solaris Cluster HA-container data service failover zone and Zone Cluster.

StorageTek QFS on Oracle Solaris Cluster

TABLE 2   StorageTek QFS Support for Oracle Solaris Cluster 4 SPARC

QFS Version	Oracle Solaris Cluster Version	Notes
5.3	4.0	See SAM-QFS 5.3 What Works With What.
5.3-01 Patch	4.1	
5.4	4.2 with Oracle Solaris 11.1	
5.4-01 Patch	4.2 with Oracle Solaris 11.2	See SAM-QFS 5.3 What Works With What.

TABLE 3   StorageTek QFS Support for Oracle Solaris Cluster 4 SPARC

QFS Version	Oracle Solaris Cluster Version	Notes
5.3	4.0	See SAM-QFS 5.3 What Works With What.
5.3-01 Patch	4.1	
5.4	4.2 with Oracle Solaris 11.1	
5.4-01 Patch	4.2 with Oracle Solaris 11.2	See SAM-QFS 5.3 What Works With What.

Oracle Solaris Cluster Manager

Java Compatibility

- Oracle Solaris Cluster 4.3 SRU 3 (and later SRUs) – Cluster nodes hosting the app-server can have Java SE 7 or 8 configured.
- Oracle Solaris Cluster 4.2, and 4.3 releases prior to 4.3 SRU 3 – Must have Java SE 7 configured.

Browser Compatibility With Oracle Solaris Cluster Manager

The Oracle Solaris Cluster Manager graphical user interface provided with Oracle Solaris Cluster 4.2 and Oracle Solaris Cluster 4.3 is compatible with the following browsers. The browsers must have Java Plug-in 1.7.0 or later.

- **Internet Explorer** – 8, 9, 10, 11

  Support for Internet Explorer 11 starts with Oracle Solaris Cluster 4.3 SRU 3

- **Firefox** – 14 and later
- **Safari** – 5 and later
- **Chrome** – 18 and later

Oracle Solaris Cluster Quorum Server Software

You can use Oracle Solaris Cluster Quorum Server software to configure a machine as a quorum server and then configure the quorum server as your cluster's quorum device. You can use a quorum server instead of, or in addition to, shared disks.

- Supported hardware – The supported hardware platforms for a quorum server are the same as for a global-cluster node.
- Operating system – Oracle Solaris software requirements for Oracle Solaris Cluster software apply as well to Quorum Server software.
- Non-global zones – A quorum server cannot be installed and configured in a non-global zone.
- Service to multiple clusters – You can configure a quorum server as a quorum device to more than one cluster.
- Mixed hardware and software – You do not have to configure a quorum server on the same hardware and software platform as the cluster or clusters that it provides quorum to. For example, a SPARC based machine that runs the Oracle Solaris 10 OS can be configured as a quorum server for an x64-based cluster that runs the Oracle Solaris 11 OS. See Table 4, "Quorum Server Interoperability With Cluster Node Software," on page 24 for Oracle Solaris Cluster version interoperability.
- Using a cluster node as a quorum server – You can configure a quorum server on a cluster node to provide quorum for clusters other than the cluster that the node belongs to. However, a quorum server that is configured on a cluster node is not highly available.
- Quorum server software must be patched or upgraded before patching or upgrading cluster nodes. Refer to "How to Upgrade Quorum Server Software" in *Oracle Solaris Cluster 4.3 Upgrade Guide*.

TABLE 4   Quorum Server Interoperability With Cluster Node Software

Quorum Server Software from:	Software running on the cluster nodes								
	Solaris Cluster 3.2	Solaris Cluster 3.2 2/08	Solaris Cluster 3.2 1/09	Solaris Cluster 3.2 + patch[b]	Solaris Cluster 3.2 2/08 + patch[b]	Solaris Cluster 3.2 1/09 + patch[b]	Solaris Cluster 3.2 11/09	Oracle Solaris Cluster 3.3 and updates	Oracle Solaris Cluster 4
Solaris Cluster 3.2	Y	Y	Y						

Quorum Server Software from:	Software running on the cluster nodes								
	Solaris Cluster 3.2	Solaris Cluster 3.2 2/08	Solaris Cluster 3.2 1/09	Solaris Cluster 3.2 + patch[b]	Solaris Cluster 3.2 2/08 + patch[b]	Solaris Cluster 3.2 1/09 + patch[b]	Solaris Cluster 3.2 11/09	Oracle Solaris Cluster 3.3 and updates	Oracle Solaris Cluster 4
Solaris Cluster 3.2 2/08	Y	Y	Y						
Solaris Cluster 3.2 1/09	Y	Y	Y						
Solaris Cluster 3.2 + Patch[a]	Y	Y	Y	Y	Y	Y	Y	Y	Y
Solaris Cluster 3.2 2/08 + Patch[a]	Y	Y	Y	Y	Y	Y	Y	Y	Y
Solaris Cluster 3.2 1/09 + Patch[a]	Y	Y	Y	Y	Y	Y	Y	Y	Y
Solaris Cluster 3.2 11/09	Y	Y	Y	Y	Y	Y	Y	Y	Y
Oracle Solaris Cluster 3.3 and updates	Y	Y	Y	Y	Y	Y	Y	Y	Y
Oracle Solaris Cluster 4	Y	Y	Y	Y	Y	Y	Y	Y	Y

- a – Solaris Cluster 3.2 Quorum Server Patch 127404-03 (Solaris 9 SPARC), 127405-04 (Oracle Solaris 10 SPARC), or 127406-04 (Oracle Solaris 10 x86) or higher
- b – Solaris Cluster 3.2 Core Patch 126105-38 (Solaris 9 SPARC), 126106-38 (Oracle Solaris 10 SPARC), or 126107-38 (Oracle Solaris 10 x86) or higher

Trusted Extensions Feature of Oracle Solaris on Oracle Solaris Cluster

The Trusted Extensions feature of Oracle Solaris may be used with Oracle Solaris Cluster 4.1 and later 4.x releases.

Virtualized OS Environments and Oracle Solaris Cluster

Oracle Solaris Cluster supports virtualized OS environments.

Support for Oracle VM Server for SPARC

The following tables list support for Oracle VM Server for SPARC, previously known as Logical Domains (LDoms):

- Table 5, "Oracle VM Server for SPARC on Oracle Solaris Cluster Versions 4.2 to 4.3 Support Matrix," on page 26
- Table 6, "Oracle VM Server for SPARC on Oracle Solaris Cluster Versions 4.0 to 4.1 Support Matrix," on page 28
- Table 7, "Oracle VM Server for SPARC 3.4x and 3.5.x on SPARC Servers Support Matrix," on page 29
- Table 8, "Oracle VM Server for SPARC 2.1 to 3.3.x on SPARC Servers Support Matrix," on page 30

Also refer to the respective Oracle VM Server for SPARC product information for software, firmware, hardware, and patch requirements and restrictions for the specific hardware and release of Oracle VM Server for SPARC being deployed.

TABLE 5   Oracle VM Server for SPARC on Oracle Solaris Cluster Versions 4.2 to 4.3 Support Matrix

Oracle VM Server for SPARC	Oracle Solaris Cluster 4.2 with Oracle Solaris 11.1	Oracle Solaris Cluster 4.2 with Oracle Solaris 11.2	Oracle Solaris Cluster 4.2 with Oracle Solaris 11.3	Oracle Solaris Cluster 4.3 with Oracle Solaris 11.2	Oracle Solaris Cluster 4.3 with Oracle Solaris 11.3
Oracle VM Server for SPARC 3.0[a]	Y				
Oracle VM Server for SPARC 3.1.0.0[b]	Y				

Oracle VM Server for SPARC	Oracle Solaris Cluster 4.2 with Oracle Solaris 11.1	Oracle Solaris Cluster 4.2 with Oracle Solaris 11.2	Oracle Solaris Cluster 4.2 with Oracle Solaris 11.3	Oracle Solaris Cluster 4.3 with Oracle Solaris 11.2	Oracle Solaris Cluster 4.3 with Oracle Solaris 11.3
Oracle VM Server for SPARC 3.1.1.0[c]	Y[t]	Y[u]			
Oracle VM Server for SPARC 3.1.1.1[e,d]		Y			
Oracle VM Server for SPARC 3.1.1.2[g,h]		Y			
Oracle VM Server for SPARC 3.2.0.0[i,h]		Y			
Oracle VM Server for SPARC 3.2.0.1[j,i]		Y		Y	
Oracle VM Server for SPARC 3.3.0.0[l,k]			Y		Y
Oracle VM Server for SPARC 3.3.0.1[m,l]			Y		Y
Oracle VM Server for SPARC 3.4.0.0[n,l]			Y[v]		Y
Oracle VM Server for SPARC 3.4.0.1[o,l]			Y[v]		Y
Oracle VM Server for SPARC 3.4.0.2[l]			Y[v]		Y
Oracle VM Server for SPARC 3.4.0.3[l]			Y[v]		Y
Oracle VM Server for SPARC 3.5[x]					Y

- a – Oracle VM Server for SPARC 3.0 is released with Oracle Solaris 11.1 SRU 1
- b – Oracle VM Server for SPARC 3.1 is released with Oracle Solaris 11.1 SRU 10

- c – Supports Oracle VM Server for SPARC features provided with Oracle VM Server for SPARC 3.1
- d – Supports Oracle VM Server for SPARC features provided with Oracle VM Server for SPARC 3.1, plus Fibre Channel SR-IOV
- e – Oracle VM Server for SPARC 3.1.1.1 is released with Oracle Solaris 11.2 SRU 2
- g – Oracle VM Server for SPARC 3.1.1.2 is released with Oracle Solaris 11.2 SRU 5
- h – Oracle VM Server for SPARC 3.2 is released with Oracle Solaris 11.2 SRU 8
- i – Supports Oracle VM Server for SPARC features provided with Oracle VM Server for SPARC 3.1, plus Fibre Channel SR-IOV
- j – Oracle VM Server for SPARC 3.2.0.1 is released with Oracle Solaris 11.2 SRU 11
- k – Oracle VM Server for SPARC 3.3 is released with Oracle Solaris 11.3
- l – Supports Oracle VM Server for SPARC features provided with Oracle VM Server for SPARC 3.1, plus Fibre Channel SR-IOV and as noted in this chapter
- m – Oracle VM Server for SPARC 3.3.0.1 is released with Oracle Solaris 11.3 SRU 4
- n – Oracle VM Server for SPARC 3.4.0.0 is released with Oracle Solaris 11.3 SRU 8
- o – Oracle VM Server for SPARC 3.4.0.1 is released with Oracle Solaris 11.3 SRU 11
- t – Oracle VM Server for SPARC 3.1.1 is released with Oracle Solaris 11.1 SRU 17
- u – Oracle VM Server for SPARC 3.1.1 is released with Oracle Solaris 11.2
- v – The Oracle Solaris Cluster 4.2 HA for VM Server for SPARC Data Service is not supported. For information, see .
- x – Oracle VM Server for SPARC 3.5.x is released with Oracle Solaris 11.3 SRU 21. Support starts with Oracle Solaris Cluster 4.3 SRU 8.

TABLE 6   Oracle VM Server for SPARC on Oracle Solaris Cluster Versions 4.0 to 4.1 Support Matrix

Oracle VM Server for SPARC	Oracle Solaris Cluster 4.0	Oracle Solaris Cluster 4.1 with Oracle Solaris 11.1	Oracle Solaris Cluster 4.1 with Oracle Solaris 11.2[s]
Oracle VM Server for SPARC 2.1	Y		
Oracle VM Server for SPARC 2.2	Y	Y[p]	
Oracle VM Server for SPARC 3.0[a]		Y[q]	
Oracle VM Server for SPARC 3.1.0.0[b]		Y[q]	
Oracle VM Server for SPARC 3.1.1.0[c]		Y[r]	
Oracle VM Server for SPARC 3.1.1.1[e,d]			Y
Oracle VM Server for SPARC 3.1.1.2[g,h]			Y
Oracle VM Server for SPARC 3.2.0.0[h,i]			Y
Oracle VM Server for SPARC 3.2.0.1[j,l]			Y

- a – Oracle VM Server for SPARC 3.0 is released with Oracle Solaris 11.1 SRU 1
- b – Oracle VM Server for SPARC 3.1 is released with Oracle Solaris 11.1 SRU 10
- c – Supports Oracle VM Server for SPARC features provided with Oracle VM Server for SPARC 3.1
- d – Supports Oracle VM Server for SPARC features provided with Oracle VM Server for SPARC 3.1, plus Fibre Channel SR-IOV
- e – Oracle VM Server for SPARC 3.1.1.1 is released with Oracle Solaris 11.2 SRU 2
- f – Supports Oracle VM Server for SPARC features provided with Oracle VM Server for SPARC 3.1, plus Fibre Channel SR-IOV
- g – Oracle VM Server for SPARC 3.1.1.2 is released with Oracle Solaris 11.2 SRU 5
- h – Oracle VM Server for SPARC 3.2 is released with Oracle Solaris 11.2 SRU 8
- i – Supports Oracle VM Server for SPARC features provided with Oracle VM Server for SPARC 3.1, plus Fibre Channel SR-IOV
- j – Oracle VM Server for SPARC 3.2.0.1 is released with Oracle Solaris 11.2 SRU 11
- p – Oracle VM Server for SPARC 2.2 is released with Oracle Solaris 11.1
- q – Support starts with Oracle Solaris Cluster 4.1 SRU 3
- r – Oracle VM Server for SPARC 3.1.1 is released with Oracle Solaris 11.1 SRU 17. Support starts with Oracle Solaris Cluster 4.1 SRU 7.
- s – Oracle Solaris 11.2 support starts with Oracle Solaris Cluster 4.1 SRU 8
- t – Oracle VM Server for SPARC 3.1.1 is released with Oracle Solaris 11.1 SRU 17
- u – Oracle VM Server for SPARC 3.1.1 is released with Oracle Solaris 11.2

TABLE 7   Oracle VM Server for SPARC 3.4x and 3.5.x on SPARC Servers Support Matrix

Server	Oracle VM Server for SPARC 3.4.x	Oracle VM Server for SPARC 3.5.x
SPARC T7 Series servers	Y	Y
SPARC M8 Series servers	Y	Y
SPARC T8 Series servers	Y	Y
Fujitsu SPARC M12 servers	Y	Y
Fujitsu M10 servers	Y	Y
Netra SPARC T3-1	Y	Y
Netra SPARC T3-1B	Y	Y
Netra SPARC T4-1	Y	Y
Netra SPARC T4-1B	Y	Y
Netra SPARC T4-2	Y	Y
Netra SPARC T5-1B	Y	
SPARC Enterprise T5120	Y	Y
SPARC Enterprise T5140	Y	Y
SPARC Enterprise T5220	Y	Y

Server	Oracle VM Server for SPARC 3.4.x	Oracle VM Server for SPARC 3.5.x
SPARC Enterprise T5240	Y	Y
SPARC Enterprise T5440	Y	Y
SPARC M5-32 server	Y	Y
SPARC M6-32 server	Y	Y
SPARC M7-8 server	Y	Y
SPARC M7-16 server	Y	Y
SPARC S7-2 server	Y	Y
SPARC S7-2L server	Y	Y
SPARC T3-1 server	Y	Y
SPARC T3-1B	Y	Y
SPARC T3-2 server	Y	Y
SPARC T3-4 server	Y	Y
SPARC T4-1 server	Y	Y
SPARC T4-1B	Y	Y
SPARC T4-2 server	Y	Y
SPARC T4-4 server	Y	Y
SPARC T5-1B server module	Y	Y
SPARC T5-2 server	Y	Y
SPARC T5-4 server	Y	Y
SPARC T5-8 server	Y	Y
Sun Blade T6320	Y	Y
Sun Blade T6340	v	Y
Sun Netra CP3260	Y	Y
Sun Netra T5220	Y	Y
Sun Netra T5440	Y	Y

TABLE 8   Oracle VM Server for SPARC 2.1 to 3.3.x on SPARC Servers Support Matrix

Server	Oracle VM Server for SPARC 2.1	Oracle VM Server for SPARC 2.2	Oracle VM Server for SPARC 3.0	Oracle VM Server for SPARC 3.1.x	Oracle VM Server for SPARC 3.2.x	Oracle VM Server for SPARC 3.3.x
SPARC T7 Series servers						Y
SPARC M8 Series servers			Y	Y	Y	Y
SPARC T8 Series servers			Y	Y	Y	Y
Fujitsu SPARC M12 servers			Y	Y	Y	Y
Fujitsu M10 servers			Y	Y	Y	Y
Netra SPARC T3-1	Y	Y	Y	Y	Y	Y

Server	Oracle VM Server for SPARC 2.1	Oracle VM Server for SPARC 2.2	Oracle VM Server for SPARC 3.0	Oracle VM Server for SPARC 3.1.x	Oracle VM Server for SPARC 3.2.x	Oracle VM Server for SPARC 3.3.x
Netra SPARC T3-1B	Y	Y	Y	Y	Y	Y
Netra SPARC T4-1	Y	Y	Y	Y	Y	Y
Netra SPARC T4-1B	Y	Y	Y	Y	Y	Y
Netra SPARC T4-2	Y	Y	Y	Y	Y	Y
Netra SPARC T5-1B			Y	Y		
SPARC Enterprise T5120	Y	Y	Y	Y	Y	Y
SPARC Enterprise T5140	Y	Y	Y	Y	Y	Y
SPARC Enterprise T5220	Y	Y	Y	Y	Y	Y
SPARC Enterprise T5240	Y	Y	Y	Y	Y	Y
SPARC Enterprise T5440	Y	Y	Y	Y	Y	Y
SPARC M5-32 server			Y	Y	Y	Y
SPARC M6-32 server				Y	Y	Y
SPARC M7-8 server						Y
SPARC M7-16 server						Y
SPARC T3-1 server	Y	Y	Y	Y	Y	Y
SPARC T3-1B	Y	Y	Y	Y	Y	Y
SPARC T3-2 server	Y	Y	Y	Y	Y	Y
SPARC T3-4 server	Y	Y	Y	Y	Y	Y
SPARC T4-1 server	Y	Y	Y	Y	Y	Y
SPARC T4-1B	Y	Y	Y	Y	Y	Y
SPARC T4-2 server	Y	Y	Y	Y	Y	Y
SPARC T4-4 server	Y	Y	Y	Y	Y	Y
SPARC T5-1B server module			Y	Y	Y	Y
SPARC T5-2 server			Y	Y	Y	Y
SPARC T5-4 server			Y	Y	Y	Y
SPARC T5-8 server			Y	Y	Y	Y
Sun Blade T6320	Y	Y	Y	Y	Y	Y
Sun Blade T6340	Y	Y	Y	Y	Y	Y
Sun Netra CP3260	Y	Y	Y	Y	Y	Y
Sun Netra T5220	Y	Y	Y	Y	Y	Y
Sun Netra T5440	Y	Y	Y	Y	Y	Y

Guidelines and Restrictions on Oracle VM Server for SPARC Running Oracle Solaris Cluster

Guidelines and restrictions are documented in the *Oracle Solaris Cluster 4.3 Release Notes*, *Oracle Solaris Cluster 4.3 Software Installation Guide*, and *Oracle Solaris Cluster Data Service for Oracle VM Server for SPARC Guide*.

Restrictions include:

- Exporting Storage from I/O Domains – I/O domain clusters cannot export storage devices to guest domain clusters. Non-clustered I/O domains must be used.
- Fencing – Guest domain clusters must disable fencing when an I/O domain exports a storage LUN to more than one guest domain.
- Virtual Disk Multipathing – Setting multipathing groups with `mpgroup` is not supported.

The server model, and version of Oracle Solaris and Oracle VM Server for SPARC, may also specify guidelines and restrictions in their documentation sets.

Oracle VM Server for SPARC Virtual HBA

Oracle Solaris Cluster supports Oracle VM Server for SPARC virtual SCSI HBA (vHBA). Support starts with:

- Oracle Solaris Cluster 4.3
- Oracle VM Server for SPARC 3.3

VSAN on N_Port ID Virtualization (NPIV) enables support of VSANs/vHBAs for different guest domain clusters on a shared HBA port. Support starts with:

- Oracle Solaris 11.3 SRU 10
- Oracle Solaris Cluster 4.3 SRU 3

Oracle Solaris I/O multipathing (MPxIO) support starts with:

- Oracle Solaris 11.3 SRU 13
- Oracle Solaris Cluster 4.3 SRU 3

Refer to Oracle Solaris Cluster 4.x Requirements when using Virtual HBA in Oracle VM Server (Doc ID 2094724.1) on My Oracle Support for details and requirements.

PCIe Single Root I/O Virtualization From Oracle VM Server for SPARC

Oracle Solaris Cluster supports PCIe Single Root I/O Virtualization (SR-IOV), a feature introduced with Oracle VM Server for SPARC 2.2.

- Support starts with Oracle VM Server for SPARC 2.2. See Table 6, "Oracle VM Server for SPARC on Oracle Solaris Cluster Versions 4.0 to 4.1 Support Matrix," on page 28 for supported Oracle Solaris Cluster releases.
- Hardware support includes Oracle Solaris Cluster supported servers and Ethernet network adapters as supported by Oracle VM Server for SPARC releases.
- Hardware support includes Oracle Solaris Cluster supported and InfiniBand HCAs as supported by Oracle VM Server for SPARC releases.
- Hardware support includes Oracle Solaris Cluster supported servers and Fibre Channel HBAs as supported by Oracle VM Server for SPARC releases.

Refer to Oracle VM Server for SPARC PCIe Direct I/O and SR-IOV Features (Doc ID 1325454.1) on My Oracle Support and the respective Oracle VM Server for SPARC Release Notes for details and requirements.

Oracle VM Server for SPARC Mixed Configurations

It is possible to configure multiple clusters using the same physical servers with different domains as cluster nodes. It is also possible to run different versions of Oracle Solaris Cluster and Oracle Solaris in these clusters.

Oracle Solaris Cluster also supports the coexistence of the following on the same set of physical servers:

- Control domain clusters – Oracle Solaris Cluster running in static/non-migrating control domains.
- I/O domain clusters – Oracle Solaris Cluster running in static/non-migrating I/O domains.
- Guest domain clusters – Oracle Solaris Cluster running in guest domains.
- Cluster managed domains – Cluster resources managed by the HA data service for Oracle VM Server for SPARC. The HA data service for Oracle VM Server for SPARC runs in a control domain cluster.

Supported versions are:

- Oracle Solaris Cluster: 3.3, 3.3 5/11, 3.3 3/13, 4.0, 4.1, 4.2, 4.3 – Includes patches and SRUs

- Oracle Solaris: 10, 11 – Includes updates, patches, and SRUs as supported by Oracle Solaris Cluster release
- Oracle VM Server for SPARC: 2.1, 2.2, 3.0, 3.1, 3.1.1, 3.1.1.1, 3.1.1.2, 3.2, 3.2.0.1, 3.3, 3.3.0.1, 3.4, 3.4.0.1, 3.4.0.2, 3.4.0.3 – As supported by Oracle Solaris Cluster release

Oracle Solaris Cluster HA for Oracle VM Server for SPARC Data Service

The Oracle Solaris Cluster HA for Oracle VM Server for SPARC data service provides a mechanism for orderly start-up and shutdown, fault monitoring, and automatic failover of Oracle VM Server for SPARC guest domain services.

See the Oracle VM Server for SPARC application discussions in:

- Table 10, "Data Services for Oracle Solaris Cluster 4.3 on SPARC," on page 38
- Table 28, "Data Services for Oracle Solaris Cluster 4.2 on SPARC," on page 62
- Table 42, "Data Services for Oracle Solaris Cluster 4.1 on SPARC," on page 84

Guest Domains on Oracle Solaris Cluster

A protected guest domain service may be a black box. A protected guest domain service may also be a single-node Oracle Solaris Cluster, which requires one of the following configurations in the guest domain.

Guest domain on Oracle Solaris Cluster 4.3 and Oracle Solaris Cluster 4.2

- Oracle Solaris Cluster 4.2 SRU 5 (and later SRUs), 4.3 (and SRUs)
- Oracle Solaris 11.2 SRU 13 (and SRUs), Oracle Solaris 11.3 (and SRUs)
- Oracle VM Server for SPARC 3.2.0.1, 3.3, 3.3.0.1, 3.4, 3.4.0.1. 3.4.0.2, 3.4.0.3 as released with Oracle Solaris version

Guest domain on Oracle Solaris Cluster 4.2

- Oracle Solaris Cluster 4.2 (and SRUs earlier than 5)
- Oracle Solaris 11.1 (and SRUs), S11.2 (and SRUs earlier than 13)
- Oracle VM Server for SPARC 3.0, 3.1, 3.1.1, 3.1.1.1, 3.1.1.2, 3.2, 3.2.0.1 as released with Oracle Solaris version

Guest domain on Oracle Solaris Cluster 4.1 SRU 8

- Oracle Solaris Cluster 4.1 SRU 8 (and later SRUs)
- Oracle Solaris 11.2 (and SRUs earlier than 13)

- Oracle VM Server for SPARC 3.1.1.1, 3.1.1.2, 3.2, 3.2.0.1 as released with Oracle Solaris version

Guest domain on Oracle Solaris Cluster 4.1 SRU 4

- Oracle Solaris Cluster 4.1 SRU 4 (and later SRUs)
- Oracle Solaris 11.1 (and SRUs)
- Oracle VM Server for SPARC 3.0, 3.1, 3.1.1 as released with Oracle Solaris version

Guest domain on Oracle Solaris Cluster 3.3 3/13

- Oracle Solaris Cluster 3.3 3/13 with patch 145333-24 (or later)
- Oracle Solaris 10 8/11, 10 3/13
- Oracle VM Server for SPARC 3.0, 3.1, 3.1.1.1

Applications and data services that run in a single-node cluster configuration are supported by the Oracle Solaris Cluster release that is running in the protected guest domain.

Control Domains

Control domain requirements for Oracle Solaris Cluster 4 are identical to guest domain requirements as described in "Guest Domains on Oracle Solaris Cluster" on page 34.

Volume Managers Supported on Oracle Solaris Cluster

A volume manager is optionally run on each node of the cluster.

TABLE 9   Oracle Solaris Cluster 4 Supported Volume Managers

Volume Manager	Platform/Version	Oracle Solaris	Notes
Solaris Volume Manager (SVM)	SPARC and x64	SVM is bundled with Oracle Solaris. Details in "Oracle Solaris Releases" on page 22.	See the Oracle Solaris Cluster Release Notes for patch and other requirements.
Solaris Volume Manager for Solaris Cluster (Multi-Owner Disk Set)	SPARC and x64	SVM for Solaris Cluster is bundled with Oracle Solaris. Details in "Oracle Solaris Releases" on page 22.	Only supported with Oracle RAC clusters. See the respective Oracle Solaris Cluster Release Notes for patch and other requirements.

◆ ◆ ◆ C H A P T E R 3

Data Service Support for Oracle Solaris Cluster 4.3

This chapter covers data service support for Oracle Solaris Cluster 4.3 in the following sections:

Application Services on Oracle Solaris Cluster 4.3

An application service is an application along with a data service which makes the application highly available or scalable in Oracle Solaris Cluster.

- **Data Services –** All Oracle Solaris Cluster 4.3 data services are supported in the global zone. Many data services are supported with the Oracle Solaris HA-container data service failover zone and Zone Cluster.
- All Oracle Solaris Cluster 4.3 data services are supported with IPv4. Support of IPv6 environments is noted in the preceding data services tables.
- Most data services are capable of being used on a cluster node running Oracle Solaris 11.3 in FIPS 140-2 mode, except as noted in the Data Services tables.
- **Zone Clusters –** Oracle Solaris Cluster 4.3 Zone Clusters support both `solaris` and `solaris10` branded zones. The zone cluster notation in the Data Services tables indicates the `solaris` brand. The `solaris10` branded zones are supported with Oracle Solaris Cluster 3.3 3/13 data services, and some Oracle Solaris Cluster 3.3 5/11 data services, as indicated in the following tables:

TABLE 10   Data Services for Oracle Solaris Cluster 4.3 on SPARC

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on SPARC
Apache Tomcat	6.0: starting with 6.0.28 7.0: starting with 7.0.06 8.5.x	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster
Apache Web Server	2.2.x 2.4.x	■ Failover, scalable ■ Global zone, zone cluster ■ Supports both HTTPS and HTTP ■ 2.2.x shipped with Oracle Solaris 11.2 or Oracle Solaris 11.3, and the same versions from the Apache web site ■ 2.4.x versions from the Apache web site
Domain Name Service (DNS)	N/A	■ Failover ■ Global zone, zone cluster
Dynamic Host Configuration Protocol (DHCP)	N/A	■ Failover ■ Global zone
Generic Data Service (GDS) (SUNW.gds)	N/A	■ Failover, multiple master, scalable ■ Global zone, zone cluster
Generic Data Service version 2 (GDSv2) (ORCL.gds and ORCL.gds_proxy)	N/A	■ Failover, multiple master, scalable, proxy ■ Global zone, zone cluster
IBM WebSphere MQ	7.5, 8.0	■ Failover ■ Global zone, zone cluster
MySQL: ■ MySQL Community Edition ■ MySQL Standard Edition ■ MySQL Enterprise Edition	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6, 5.7 Cluster 7.5.x requires at least Oracle Solaris Cluster 4.3	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: Global zone, zone cluster ■ Data service supports MySQL replication in Oracle Solaris Cluster Geographic Edition. See "MySQL for Data Replication" on page 114.
MySQL Cluster and MySQL Cluster CGE	7.0: starting with 7.0.7 7.1: starting with 7.1.0 7.2: starting with 7.2.0	■ Multiple master, scalable ■ Global zone, zone cluster

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on SPARC
	7.5: starting with 7.5.0., running on Oracle Solaris 11 with the Solaris Studio 12.5 libraries	
NFS	V3 V4	■ Failover ■ Global zone
Oracle Business Intelligence Enterprise Edition	10.1.3: starting with 10.1.3.0 11.1.1.7	■ Failover, multiple master ■ Global zone, zone cluster ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption
Oracle Communications ASAP	7.2 7.3	■ Failover ■ Global zone, zone cluster ■ 7.3 requires at least Oracle Solaris Cluster 4.3 SRU 1
Oracle Database (HA-Oracle)	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2 12c Release 2: ■ 12.2.0.1	■ Failover ■ Global zone, zone cluster ■ 11.2.0.3, 11.2.0.4: Details in Table 16, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 49 ■ 12.1.0.1, 12.1.0.2: Details in Table 14, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 48 ■ 12.2.0.1: Details in Table 12, "HA-Oracle 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 47

Oracle E-Business Suite	12.1.3
	
	12.2.4, 12.2.5
		■ Failover
		■ Global zone, zone cluster
		■ Starting with Oracle Solaris Cluster 4.3 SRU2, this data service may be used when Oracle Solaris is configured to use FIPS 140-2 compliant encryption
		■ 12.2.4, 12.2.5:
		  ■ Oracle Solaris Cluster 4.3 SRU 3 and later SRUs
		  ■ Requires Oracle E-Business Suite AD/TXK Delta level 6 or later patches

Oracle Essbase	11.1.2	■ Failover ■ Global zone, zone cluster
Oracle External Proxy	N/A	■ Failover, multiple master ■ Global zone, zone cluster ■ Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC) running on Solaris (SPARC or x64) ■ Interrogates remote 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC) running on Oracle Linux on the

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on SPARC
		following platforms: Oracle servers, Oracle Exadata, Oracle Database Appliance ■ Can be used to monitor 12c RAC Pluggable Databases
Oracle GlassFish Server Message Queue	4.5.2	■ Failover ■ Global zone, zone cluster ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption
Oracle GoldenGate	11.2.1, 12.1.2.x, 12.2.0.x	■ Failover ■ Global zone, zone cluster
Oracle iPlanet Web Server	7.0.15	■ Failover, scalable ■ Global zone, zone cluster ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption
Oracle JD Edwards EnterpriseOne Enterprise Server	9.1.2, 9.1.3, 9.1.4, 9.1.5.5	■ Failover, multiple instance, multiple master ■ Global zone, zone cluster ■ Version 9.1.5.5 requires Oracle Solaris 11.2
Oracle Real Application Clusters (RAC) Enterprise Edition	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2 12c Release 2: ■ 12.2.0.1	■ Global zone, zone cluster ■ Supports administrator and policy managed databases ■ 11.2.0.3, 11.2.0.4: Details in Table 22, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 52 ■ 12.1.0.1, 12.1.0.2: Details in Table 20, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 51 ■ 12.2.0.1: Details in Table 18, "Oracle RAC 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 SRU 7 and Higher on SPARC," on page 51
Oracle Siebel	8.1.1.11, 8.1.1.14 8.2.2.2 Innovation Pack 2015	■ Failover ■ Global zone, zone cluster ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption ■ Oracle Siebel 8.1.1.x support with Oracle Solaris 11.3 (and SRUs) only ■ Oracle Siebel 8.1.1.x support with Oracle Solaris Cluster 4.3 SRU 3 (and later SRUs), or Oracle Solaris Cluster 4.3 releases prior to SRU 3 with a workaround – see instructions in MOS, Bug ID 22698512 ■ Oracle Siebel Innovation Pack 2015 support with Oracle Solaris Cluster 4.3 SRU 3 (and later SRUs)
Oracle Solaris Zones	Brand types: `solaris`, `solaris10`, and `solaris-kz`	■ Failover, multiple master ■ Global zone ■ `solaris-kz` branded zones: Warm and live migration supported ■ `solaris-kz` branded zones on NFS URI supported from ZFSSA

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on SPARC

Oracle TimesTen	11g:
	
	■ 11.2.2.x
		■ Failover, scalable
		■ Global zone, zone cluster
		■ Supported configs:
		  ■ `failover master`
		  ■ `scalable / multiple master`
		  ■ `active-active`
		■ Not supported: Active-standby

Oracle Traffic Director	11.1.1.7	■ Failover ■ Global zone, zone cluster ■ Supported on Engineered Systems only
Oracle VM Server for SPARC	3.2.0.1 3.3, 3.3.0.1, 3.4 3.5	■ Failover ■ Global zone ■ See also "Support for Oracle VM Server for SPARC" on page 26 ■ Version 3.4 and later require at least Oracle Solaris Cluster 4.3 SRU 4
Oracle Web Tier	11.1.1.4, 11.1.1.5	■ Failover ■ Global zone, zone cluster
Oracle WebLogic Server	10.3.3, 10.3.4, 10.3.5, 10.3.6 12.1.1.0, 12.1.2.0, 12.1.3.0 12.2.1.2 requires at least Oracle Solaris Cluster 4.3	■ Failover, multiple master, multi-instance ■ Global zone, zone cluster ■ Sockets Direct Protocol (SDP) support: ■ 10.3.5 and 10.3.6 are supported in Engineered Systems
PeopleSoft Application Server	PeopleTools 8.52, 8.53	■ Failover ■ Global zone, zone cluster
PeopleSoft Process Scheduler	PeopleTools 8.52, 8.53	■ Failover ■ Global zone, zone cluster
PostgreSQL	9.0.x, 9.1.x, 9.2.x, 9.3.x, 9.4.x, 9.5.x, 9.6.x	■ Failover ■ Failover zone, global zone, zone cluster ■ Starting with Oracle Solaris Cluster 4.3 SRU 2, this data service may be used when Oracle Solaris is configured to use FIPS 140-2 compliant encryption
Samba	3.6.23 as shipped with Oracle Solaris 11.2 4.4.x	■ Samba (smbc, nmbd): Failover ■ Winbind: Failover ■ Global zone, zone cluster ■ For Samba 4, `smb.conf` requires client max protocol = SMB2 ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption
SAP liveCache	7.7, 7.9	■ Failover ■ Global zone, zone cluster

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on SPARC
SAP MaxDB	7.8, 7.9	■ Failover ■ Global zone, zone cluster

SAP NetWeaver	Versions that run on SAP kernels:
	
	■ 720_EXT, minimum patch level 300
	■ 721_EXT, minimum patch level 130
	■ 722, minimum patch level 25
	■ 740, minimum patch level 36
	■ 741, minimum patch level 11
	■ 742, minimum patch level 28
	■ 745, minimum patch level 15
	■ 749, minimum patch level 115
	■ 753, minimum patch level 90
		■ Failover, multiple master
		■ Global zone, zone cluster
		■ SAP certified. For information, see:
		
		  ■ https://www.sap.com/index.html – Click on Our Partners and then Find an SAP Partner. Expand Partner Information Center (PIC) and click on Partner Information Center. Select the Search for Solutions tab and search for "Solaris Cluster" as the Solution Name. Click on Solaris Cluster 4.
		  ■ SAP Note 1740958 – Central Note: SAP on Solaris Cluster 4.x and Solaris 11
		■ Supports all SAP versions based on the listed kernels, e.g., SAP NetWeaver 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3. 7.1, 7.1 EHP1, 7.3, 7.3 EHP1, 7.4, and all products based on those examples
		■ SAP Customer Relationship Management 6.0 (CRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
		■ SAP Enterprise Resource Planning 6.0, 6.0 EHP1, 6.0 HEP2, 6.0 EHP3, 6.0 EHP4, 6.0 EHP5, 6.0 EHP6, 6.0 EHP7
		■ SAP NetWeaver Composition Environment 7.1, 7.1 EHP1, 7.2
		■ SAP NetWeaver J2EE (Advanced) Adapter Engine 7.0, 7.0 EPH1, 7.0 EPH2, 7.3, 7.3 EPH1, 7.4
		■ SAP NetWeaver Mobile Infrastructure 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3 EHP1, 7.4
		■ SAP NetWeaver Partner Connectivity Kit 7.0, 7.0 EPH1, 7.0 EPH2, 7.3
		■ SAP NetWeaver Process Integration 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3, 7.3 EPH1, 7.4
		■ SAP NetWeaver Process Orchestration 7.3 EPH1, 7.4
		■ SAP Solution Manager 7.0 EHP1, 7.1
		■ SAP Supplier Relationship Management 5.0, 6.0 (SRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
		■ SAP Supply Chain Management 5.1 (SCM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3

Sybase Adaptive Server Enterprise (ASE)	15.7	■ Failover ■ Global zone, zone cluster ■ Supported in HA mode only – both asymmetric and symmetric ■ The Companion Server feature is not supported ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption

TABLE 11   Data Services for Oracle Solaris Cluster 4.3 on x64

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on x64
Apache Tomcat	6.0: starting with 6.0.28 7.0: starting with 7.0.06 8.5.x	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster
Apache Web Server	2.2.x 2.4.x	■ Failover, scalable ■ Global zone, zone cluster ■ Supports both HTTPS and HTTP ■ 2.2.x shipped with Oracle Solaris 11.2 or Oracle Solaris 11.3, and the same versions from the Apache web site ■ 2.4.x versions from the Apache web site
Domain Name Service (DNS)	N/A	■ Failover ■ Global zone, zone cluster
Dynamic Host Configuration Protocol (DHCP)	N/A	■ Failover ■ Global zone
Generic Data Service (GDS) (SUNW.gds)	N/A	■ Failover, multiple master, scalable ■ Global zone, zone cluster
Generic Data Service version 2 (GDSv2) (ORCL.gds and ORCL.gds_proxy)	N/A	■ Failover, multiple master, scalable, proxy ■ Global zone, zone cluster
IBM WebSphere MQ	7.5, 8.0	■ Failover ■ Global zone, zone cluster
MySQL: ■ MySQL Community Edition ■ MySQL Standard Edition ■ MySQL Enterprise Edition	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6, 5.7 Cluster 7.5.x requires at least Oracle Solaris Cluster 4.3	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: Global zone, zone cluster ■ Data service supports MySQL replication in Oracle Solaris Cluster Geographic Edition. See "MySQL for Data Replication" on page 114.
MySQL Cluster and MySQL Cluster CGE	7.0: starting with 7.0.7 7.1: starting with 7.1.0	■ Multiple master, scalable ■ Global zone, zone cluster

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on x64
	7.2: starting with 7.2.0 7.5: starting with 7.5.0., running on Oracle Solaris 11 with the Solaris Studio 12.5 libraries	
NFS	V3 V4	■ Failover ■ Global zone
Oracle Database (HA-Oracle)	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2 12c Release 2: ■ 12.2.0.1	■ Failover ■ Global zone, zone cluster ■ 11.2.0.3, 11.2.0.4: Details in Table 16, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 49 ■ 12.1.0.1, 12.1.0.2: Details in Table 14, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 48 ■ 12.2.0.1: Details in Table 13, "HA-Oracle 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 on x64," on page 48
Oracle External Proxy	N/A	■ Failover, multiple master ■ Global zone, zone cluster ■ Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC) running on Solaris (SPARC or x64) ■ Interrogates remote 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC) running on Oracle Linux on the following platforms: Oracle servers, Oracle Exadata, Oracle Database Appliance ■ Can be used to monitor 12c RAC Pluggable Databases
Oracle GlassFish Server Message Queue	4.5.2	■ Failover ■ Global zone, zone cluster ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption
Oracle GoldenGate	11.2.1, 12.1.2.x, 12.2.0.x	■ Failover ■ Global zone, zone cluster
Oracle iPlanet Web Server	7.0.15	■ Failover, scalable ■ Global zone, zone cluster ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption
Oracle Real Application Clusters (RAC) Enterprise Edition	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4	■ Global zone, zone cluster ■ Supports administrator and policy managed databases ■ 11.2.0.3, 11.2.0.4: Details in Table 16, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 49

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on x64
	12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2 12c Release 2: ■ 12.2.0.1	■ 12.1.0.1, 12.1.0.2: Details in Table 14, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 48 ■ 12.2.0.1: Details in Table 19, "Oracle RAC 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 SRU 7 and Higher on x64," on page 51
Oracle Solaris Zones	Brand types: `solaris`, `solaris10` and `solaris-kz`	■ Failover, multiple master ■ Global zone ■ `solaris-kz` branded zones: Warm and live migration supported ■ `solaris-kz` branded zones on NFS URI supported from ZFSSA

Oracle TimesTen	11g:
	
	■ 11.2.2.x
		■ Failover, scalable
		■ Global zone, zone cluster
		■ Supported configurations:
		  ■ `failover master`
		  ■ `scalable / multiple master`
		  ■ `active-active`
		■ Not supported: Active-standby

Oracle Traffic Director	11g: ■ 11.1.1.7	■ Failover ■ Global zone, zone cluster ■ Supported on Engineered Systems only
Oracle Web Tier	11.1.1.4, 11.1.1.5	■ Failover ■ Global zone, zone cluster
Oracle WebLogic Server	10.3.3, 10.3.4, 10.3.5, 10.3.6 12.1.1.0, 12.1.2.0, 12.1.3.0 12.2.1.2 requires at least Oracle Solaris Cluster 4.3	■ Failover, multiple master, multi-instance ■ Global zone, zone cluster ■ Sockets Direct Protocol (SDP) support: ■ 10.3.5 and 10.3.6 are supported in Engineered Systems
PostgreSQL	9.0.x, 9.1.x, 9.2.x, 9.3.x, 9.4.x, 9.5.x, 9.6.x	■ Failover ■ Failover zone, global zone, zone cluster ■ Starting with Oracle Solaris Cluster 4.3 SRU 2, this data service may be used when Oracle Solaris is configured to use FIPS 140-2 compliant encryption
Samba	3.6.23 as shipped with Oracle Solaris 11.2 4.4.x	■ Samba (smbc, nmbd): Failover ■ Winbind: Failover ■ Global zone, zone cluster ■ For Samba 4, `smb.conf` requires client max protocol = SMB2 ■ This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption

Application	Application Version	Comments for Oracle Solaris Cluster 4.3 on x64
SAP liveCache	7.7, 7.9	- Failover - Global zone, zone cluster
SAP MaxDB	7.8, 7.9	- Failover - Global zone, zone cluster
SAP NetWeaver	Versions that run on SAP kernels: ■ 720_EXT, minimum patch level 300 ■ 721_EXT, minimum patch level 130 ■ 722, minimum patch level 25 ■ 740, minimum patch level 36 ■ 741, minimum patch level 11 ■ 742, minimum patch level 28 ■ 745, minimum patch level 15 ■ 749, minimum patch level 115 ■ 753, minimum patch level 90	- Failover, multiple master - Global zone, zone cluster - See SAP NetWeaver entry in Table 10, "Data Services for Oracle Solaris Cluster 4.3 on SPARC," on page 38
Sybase Adaptive Server Enterprise (ASE)	15.7	- Failover - Global zone, zone cluster - Supported in HA mode only – both asymmetric and symmetric - The Companion Server feature is not supported - This data service must not be used if Oracle Solaris is configured to use FIPS 140-2 compliant encryption

Oracle Database on Oracle Solaris Cluster 4.3

The following tables contain supplemental HA-Oracle information for Table 10, "Data Services for Oracle Solaris Cluster 4.3 on SPARC," on page 38 and Table 11, "Data Services for Oracle Solaris Cluster 4.3 on x64," on page 43:

- Table 12, "HA-Oracle 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 47
- Table 13, "HA-Oracle 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 on x64," on page 48
- Table 14, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 48
- Table 15, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on x64," on page 49
- Table 16, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 49
- Table 17, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on x64," on page 50

TABLE 12   HA-Oracle 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC

HA-Oracle 12c Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC[d]
UFS	Y	Y	Y	Y	Y
QFS					
ZFS	Y	N/A	Y	Y	Y
PxFS	Y	Y	Y	Y	Y
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y	Y
ACFS					
Clustered ASM	Y	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

Note - HA-Oracle 12.2.0.1 support starts with Oracle Solaris Cluster 4.3 SRU 7 and Oracle Solaris 11.3.

- a – Includes Direct NFS (dNFS) support

- d – Oracle VM Server for SPARC virtual HBA not supported

TABLE 13   HA-Oracle 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 on x64

HA-Oracle 12c Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
UFS	Y	Y	Y	Y
QFS				
ZFS	Y	N/A	Y	Y
PxFS	Y	Y	Y	Y
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y
ACFS				
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

Note - HA-Oracle 12.2.0.1 support starts with Oracle Solaris Cluster 4.3 SRU 7 and Oracle Solaris 11.3.

- a – Includes Direct NFS (dNFS) support

TABLE 14   HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on SPARC

HA-Oracle 12c Release 1 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC[d]
UFS	Y	Y	Y	Y	Y
QFS					
ZFS	Y	N/A	Y	Y	Y
PxFS	Y	Y	Y	Y	Y
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y	Y
ACFS[b]	Y	N/A	Y	Y[c]	Y
Clustered ASM[b]	Y	Y	Y	Y[c]	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – No Oracle 12.1.0.1 Grid Infrastructure with Oracle Solaris 11.3

- c – Oracle Database 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646
- d – Oracle VM Server for SPARC virtual HBA not supported

TABLE 15   HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on x64

HA-Oracle 12c Release 1 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
UFS	Y	Y	Y	Y
QFS				
ZFS	Y	Y	N/A	Y
PxFS	Y	Y	Y	Y
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y
ACFS[b]	Y	N/A	Y	Y[c]
Clustered ASM[b]	Y	Y	Y	Y[c]
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – No Oracle 12.1.0.1 Grid Infrastructure with Oracle Solaris 11.3
- c – Oracle Database 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 16   HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC

HA-Oracle 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Global Zone	Oracle VM Server for SPARC
UFS	Y	Y	Y	Y	Y
QFS					
ZFS	Y	N/A	Y	Y	Y
PxFS	Y	Y	Y	Y	Y
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y	Y
ACFS[b]	Y	N/A	Y	Y	Y
Clustered ASM	Y	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support

- b – Oracle 11.2.0.4 required for ACFS support
- c – Oracle VM Server for SPARC virtual HBA not supported

TABLE 17   HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on x64

HA-Oracle 11g Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
UFS	Y	Y	Y	Y
QFS				
ZFS	Y	N/A	Y	Y
PxFS	Y	Y	Y	Y
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y
ACFS[b]	Y	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle 11.2.0.4 required for ACFS support

Oracle RAC on Oracle Solaris Cluster 4.3

Oracle Real Application Clusters (RAC) Enterprise Edition is supported with Oracle Solaris Cluster. Refer to the following tables for Oracle RAC support details. These tables contain supplemental information to Table 10, "Data Services for Oracle Solaris Cluster 4.3 on SPARC," on page 38 and Table 11, "Data Services for Oracle Solaris Cluster 4.3 on x64," on page 43:

- Table 18, "Oracle RAC 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 SRU 7 and Higher on SPARC," on page 51
- Table 19, "Oracle RAC 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 SRU 7 and Higher on x64," on page 51
- Table 20, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 51
- Table 21, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on x64," on page 52
- Table 22, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC," on page 52
- Table 23, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on x64," on page 53

TABLE 18   Oracle RAC 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 SRU 7 and Higher on SPARC

Oracle RAC 12c Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
Shared QFS					
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y	Y
ACFS					
Clustered ASM	Y	Y	Y	Y	Y[c]
Solaris Volume Manager	Y	N/A	Y	Y	Y[c]
HW RAID	N/A	N/A	Y	Y	Y[c]

- a – Includes Direct NFS (dNFS) support
- c – Oracle VM Server for SPARC virtual HBA not supported

TABLE 19   Oracle RAC 12c Release 2 Matrix for Oracle Solaris Cluster 4.3 SRU 7 and Higher on x64

Oracle RAC 12c Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
Shared QFS				
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y
ACFS				
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support

TABLE 20   Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on SPARC

Oracle RAC 12c Release 1 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster[b]	Oracle VM Server for SPARC
Shared QFS					

Oracle RAC 12c Release 1 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster[b]	Oracle VM Server for SPARC
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y	Y
ACFS	Y	N/A	Y	Y	Y[c]
Clustered ASM	Y	Y	Y	Y	Y[c]
Solaris Volume Manager	Y	N/A	Y	Y	Y[c]
HW RAID	N/A	N/A	Y	Y	Y[c]

- a – Includes Direct NFS (dNFS) support
- b – Oracle RAC 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646
- c – Oracle VM Server for SPARC virtual HBA not supported
- Note – No Oracle RAC 12.1.0.2 Grid Infrastructure on Oracle Solaris 11.3

TABLE 21   Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.3 on x64

Oracle RAC 12c Release 1 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster[b]
Shared QFS				
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y
ACFS	Y	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle RAC 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646
- c – Oracle VM Server for SPARC virtual HBA not supported
- Note – No Oracle RAC 12.1.0.2 Grid Infrastructure on Oracle Solaris 11.3

TABLE 22   Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on SPARC

Oracle RAC 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
Shared QFS					
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y	Y

Oracle RAC 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
ACFS[b]	Y	N/A	Y	Y	Y[c]
Clustered ASM	Y	Y	Y	Y	Y[c]
Solaris Volume Manager	Y	N/A	Y	Y	Y[c]
Solaris Volume Manager	N/A	N/A	Y	Y	Y[c]

- a – Includes Direct NFS (dNFS) support
- b – Oracle RAC 11.2.0.4 required for ACFS support
- c – Oracle VM Server for SPARC virtual HBA not supported

TABLE 23   Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.3 on x64

Oracle RAC 11g Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
Shared QFS				
ZFS Storage Appliance (NFS)[a]	N/A	N/A	Y	Y
ACFS[b]	Y	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle RAC 11.2.0.4 required for ACFS support

TABLE 24   Oracle RAC Reliable Datagram Sockets (RDS) v3 Matrix for Oracle Solaris Cluster 4.3 on SPARC

Oracle RAC Version(s)	Global Zone	Zone Cluster	Oracle VM Server for SPARC
12.1.0.1, 12.1.0.2, 12.2.0.1	Y	Y	Y
11.2.0.3, 11.2.0.4	Y	Y	Y

TABLE 25   Oracle RAC Reliable Datagram Sockets (RDS) v3 Matrix for Oracle Solaris Cluster 4.3 on x64

Oracle RAC Version(s)	Global Zone	Zone Cluster
12.1.0.1, 12.1.0.2, 12.2.0.1	Y	Y
11.2.0.3, 11.2.0.4	Y	Y

TABLE 26   Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.3 on SPARC

Data Service	Application Version	Comments
Generic Data Service (GDS) based services	N/A	■ Failover, multiple master, scalable ■ A GDS-based data service can run in a `solaris10` branded Zone Cluster provided that the application is also configured to run in a `solaris10` branded zone
HA for Apache	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Proxy Server	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Tomcat	3.3 4.0, 4.1 5.0, 5.5, 5.5.x 6.0 7.0.x 8.5.x	Failover, multiple master, scalable
HA for Domain Name Service (DNS)	Version shipped with Oracle Solaris	Failover
HA for Informix	V9.4 10 11, 11.5	Failover
HA for MySQL	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6	Failover, multiple master, scalable
HA for MySQL Cluster	7.0.x (for x >= 7) 7.1.x (for x >= 0) 7.2.x (for x >= 0)	Failover
HA for Oracle	10g Release 2: ■ 10.2.0.4, 10.2.0.5	■ Failover ■ Zone Cluster requirements:

Data Service	Application Version	Comments

		■ Oracle Solaris Cluster 3.3 5/11 + patch
		■ Oracle Solaris Cluster 3.3 3/13
		■ Global Zone requirements:
		  ■ Oracle Solaris 11.2
		  ■ Oracle Solaris 11.3

HA for Oracle Application Server	10.1.2, 10.1.3.1	Failover
HA for Oracle External Proxy	N/A	■ Failover, multiple master ■ Proxies a remote Oracle DB/RAC to reflect the DB state/status as a RGM resource state/status ■ Remote Oracle DB/RAC must be on Oracle Solaris (SPARC or x86) ■ >Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC)
HA for Oracle Web Tier	11.1.1.x	Failover
HA for Oracle WebLogic Server	10.3, 10.3.3, 10.3.4, 10.3.5, 10.3.6	■ Failover, multiple master (clustered WLS) ■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11
HA for PostgreSQL	7.3.x 8.0.x, 8.1.x, 8.2.x, 8.3.x, 8.4.x 9.0.x, 9.1.x, 9.2.x, 9.3.x, 9.4.x, 9.5.x, 9.6.x	Failover
HA for Samba	2.2.2 - 3.5.5	■ Failover ■ "Clustered" Samba is not supported
HA for SAP liveCache	7.6, 7.7	■ Failover ■ 7.6 needs at least 7.6.01.09 ■ 7.7 needs at least 7.7.07.14 (with SCM 7.0) ■ 7.7.04.38 and later supported with SCM 5.1 **Note -** SAP note 1461682 specifies corrective steps to make at install time.
HA for SAP MaxDB	7.6, 7.7, 7.8	■ Failover ■ 7.6 needs at least 7.6.01.09 ■ 7.8 support requires at least patch 147092-05
HA for SAP NetWeaver	Versions that run on SAP kernels: ■ 720 or 720_EXT, minimum patch level 300	■ Failover, multiple master ■ See SAP NetWeaver entry in Table 26, "Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.3 on SPARC," on page 54

Data Service	Application Version	Comments
	■ 721 or 721_EXT, minimum patch level 130 ■ 740, minimum patch level 36 ■ 741, minimum patch level 11 ■ 742, minimum patch level 28 ■ 749, minimum patch level 115 ■ 753, minimum patch level 90	
HA for Sun GlassFish Message Queue, formerly HA for Sun Java System Message Queue and HA for Sun One Message Queue	4.4, 4.4.u1	Failover
HA for Sun Java System Application Server	All versions until JES 5 U1, 9.1, 9.1 UR2, GlassFish V2 UR2	Failover
HA for Sun Java System Web Proxy Server	Up to and including 4.0	Failover
HA for Sun Java System Web Server	All versions up to and including JES 5 U1 are supported. All releases up to and including 7.0, 7.0 U1, 7.0 U2 and all future updates of 7.0 release.	Failover, scalable
HA for Sybase Adaptive Server Enterprise (ASE)	15.0, 15.0.1, 15.0.2, 15.0.3	Failover

HA for TimesTen	11.2.1.x (for x >= 4)
	
	11.2.2.x
		■ Failover, scalable
		■ Supported configurations:
		  ■ failover master
		  ■ scalable / multi master
		  ■ active-active
		■ Not supported: active-standby

HA for WebSphere Message Broker	6.0 7.0	Failover

Data Service	Application Version	Comments
HA for WebSphere MQ	6.0 7.0	Failover
Oracle Real Application Clusters (RAC) Enterprise Edition	10g Release 2: ■ 10.2.0.5 11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4	■ 10.2.0.5: 　■ Zone Cluster requirements: 　　■ Oracle Solaris Cluster 3.3 5/11 + patches 　　■ Oracle Solaris Cluster 3.3 3/13 　■ Global Zone requirements: 　　■ Oracle Solaris 11.1 ■ 11.2.0.3, 11.2.0.4: 　■ Zone Cluster requirements: 　　■ No UDLM 　　■ No SVM 　　■ Oracle Solaris Cluster 3.3 5/11 + patches 　　■ Oracle Solaris Cluster 3.3 3/13 　■ Global Zone requirements: 　　■ Oracle Solaris 11.2 starting with SRU 1 　　■ Oracle Solaris 11.3

TABLE 27   Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.3 on x64

Data Service	Application Version	Comments
Generic Data Service (GDS) based services	N/A	■ Failover, multiple master, scalable ■ A GDS-based data service can run in a `solaris10` branded Zone Cluster provided that the application is also configured to run in a `solaris10` branded zone
HA for Apache	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Proxy Server	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Tomcat	3.3 4.0, 4.1 5.0, 5.5, 5.5.x	Failover, multiple master, scalable

Data Service	Application Version	Comments
	6.0 7.0.x 8.5.x	
HA for Domain Name Service (DNS)	Version shipped with Oracle Solaris	Failover
HA for Informix	V9.4 10 11, 11.5	Failover
HA for MySQL	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6	Failover, multiple master, scalable
HA for MySQL Cluster	7.0.x (for x >= 7) 7.1.x (for x >= 0) 7.2.x (for x >= 0)	Failover
HA for Oracle	10g Release 2: ■ 10.2.0.4, 10.2.0.5	■ Failover ■ Zone Cluster requirements: 　■ Oracle Solaris Cluster 3.3 5/11 + patch 　■ Oracle Solaris Cluster 3.3 3/13 ■ Global Zone requirements: 　■ Oracle Solaris 11.2 　■ Oracle Solaris 11.3
HA for Oracle Application Server	10.1.2, 10.1.3.1	Failover
HA for Oracle External Proxy	N/A	■ Failover, multiple master ■ Proxies a remote Oracle DB/RAC to reflect the DB state/status as a RGM resource state/status ■ Remote Oracle DB/RAC must be on Oracle Solaris (SPARC or x86) ■ >Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC)
HA for Oracle Web Tier	11.1.1.x	Failover
HA for Oracle WebLogic Server	10.3, 10.3.3, 10.3.4, 10.3.5, 10.3.6	■ Failover, multiple master (clustered WLS) ■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11
HA for PostgreSQL	7.3.x	Failover

Data Service	Application Version	Comments
	8.0.x, 8.1.x, 8.2.x, 8.3.x, 8.4.x 9.0.x, 9.1.x, 9.2.x, 9.3.x, 9.4.x, 9.5.x, 9.6.x	
HA for Samba	2.2.2 - 3.5.5	■ Failover ■ "Clustered" Samba is not supported
HA for SAP liveCache	7.6, 7.7	■ Failover ■ 7.6 needs at least 7.6.01.09 ■ 7.7 needs at least 7.7.07.14 (with SCM 7.0) ■ 7.7.04.38 and later supported with SCM 5.1 **Note -** SAP note 1461682 specifies corrective steps to make at install time.
HA for SAP MaxDB	7.6, 7.7, 7.8	■ Failover ■ 7.6 needs at least 7.6.01.09 ■ 7.8 support requires at least patch 147092-05
HA for SAP NetWeaver	Versions that run on SAP kernels: ■ 720 or 720_EXT, minimum patch level 300 ■ 721 or 721_EXT, minimum patch level 130 ■ 740, minimum patch level 36 ■ 741, minimum patch level 11 ■ 742, minimum patch level 28 ■ 749, minimum patch level 115 ■ 753, minimum patch level 90	■ Failover, multiple master ■ See SAP NetWeaver entry in Table 26, "Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.3 on SPARC," on page 54
HA for Sun GlassFish Message Queue, formerly HA for Sun Java System Message Queue and HA for Sun One Message Queue	4.4, 4.4.u1	Failover
HA for Sun Java System Application Server	All versions until JES 5 U1, 9.1, 9.1 UR2, GlassFish V2 UR2	Failover

Data Service	Application Version	Comments
HA for Sun Java System Web Proxy Server	Up to and including 4.0	Failover
HA for Sun Java System Web Server	All versions up to and including JES 5 U1 are supported. All releases up to and including 7.0, 7.0 U1, 7.0 U2 and all future updates of 7.0 release.	Failover, scalable
HA for Sybase Adaptive Server Enterprise (ASE)	15.0, 15.0.1, 15.0.2, 15.0.3	Failover

HA for TimesTen	11.2.1.x (for x >= 4)
	
	11.2.2.x
		■ Failover, scalable
		■ Supported configurations:
		  ■ failover master
		  ■ scalable / multi master
		  ■ active-active
		■ Not supported: active-standby

HA for WebSphere Message Broker	6.0 7.0	Failover
HA for WebSphere MQ	6.0 7.0	Failover

Oracle Real Application Clusters (RAC) Enterprise Edition	10g Release 2:
	
	■ 10.2.0.5
	
	11g Release 2:
	
	■ 11.2.0.3
	■ 11.2.0.4
		■ 10.2.0.5:
		  ■ Zone Cluster requirements:
		    ■ Oracle Solaris Cluster 3.3 5/11 + patches
		    ■ Oracle Solaris Cluster 3.3 3/13
		  ■ Global Zone requirements:
		    ■ Oracle Solaris 11.1
		■ 11.2.0.3, 11.2.0.4:
		  ■ Zone Cluster requirements:
		    ■ No UDLM
		    ■ No SVM
		    ■ Oracle Solaris Cluster 3.3 5/11 + patches
		    ■ Oracle Solaris Cluster 3.3 3/13
		  ■ Global Zone requirements:
		    ■ Oracle Solaris 11.2 starting with SRU 1
		    ■ Oracle Solaris 11.3

♦ ♦ ♦　**C H A P T E R　4**

4

Data Service Support for Oracle Solaris Cluster 4.2

This chapter covers data service support for Oracle Solaris Cluster 4.2.

Application Services on Oracle Solaris Cluster 4.2

An application service is an application along with a data service which makes the application highly available or scalable in Oracle Solaris Cluster.

Data Services – All Oracle Solaris Cluster 4.2 data services are supported in the global zone. Many data services are supported with the Oracle Solaris HA-container data service failover zone and Zone Cluster as noted in the following tables:

- Table 28, "Data Services for Oracle Solaris Cluster 4.2 on SPARC," on page 62
- Table 29, "Data Services for Oracle Solaris Cluster 4.2 on x64," on page 65

All Oracle Solaris Cluster 4.2 data services are supported with IPv4. Support of IPv6 environments will be noted in the preceding data services tables.

Zone Clusters – Oracle Solaris Cluster 4.2 Zone Clusters support both `solaris` and `solaris10` branded zones. The "zone cluster" notation in the Data Services tables indicates the `solaris` brand. The `solaris10` brand zones are supported with Oracle Solaris Cluster 3.3 3/13 data services and some Oracle Solaris Cluster 3.3 5/11 data services, as indicated in the following tables:

- Table 40, "Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.2 SPARC," on page 73
- Table 41, "Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.2 x64," on page 78

TABLE 28   Data Services for Oracle Solaris Cluster 4.2 on SPARC

Application	Application Version	Comments for Oracle Solaris Cluster 4.2 on SPARC
Apache Tomcat	6.0: starting with 6.0.28 7.0: starting with 7.0.06	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster
Apache Web Server	2.2.x 2.4.x	■ Failover, scalable ■ Global zone, zone cluster ■ Both non-SSL-aware Apache and SSL-aware Apache are supported. Notes for configuring SSL-aware Apache with this data service is in Oracle Bug 20525331 available in MOS. ■ 2.2.x shipped with Oracle Solaris 11.1, Oracle Solaris 11.2 or Oracle Solaris 11.3, and the same versions from the Apache web site ■ 2.4.x versions from the Apache web site
Domain Name Service (DNS)	N/A	■ Failover ■ Global zone, zone cluster
Dynamic Host Configuration Protocol (DHCP)	N/A	■ Failover ■ Global zone
Generic Data Service (GDS) (SUNW.gds)	N/A	■ Failover, multiple master, scalable ■ Global zone, zone cluster
Generic Data Service version 2 (GDSv2) (ORCL.gds and ORCL.gds_proxy)	N/A	■ Failover, multiple master, scalable, proxy ■ Global zone, zone cluster
MySQL: ■ MySQL Community Edition ■ MySQL Standard Edition ■ MySQL Enterprise Edition	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1. x, 5.5, 5.6, 5.7	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster ■ MySQL 5.7 requires Oracle Solaris 11.2 (and SRUs) or 11.3 (and SRUs) ■ Data service supports MySQL replication in Oracle Solaris Cluster Geographic Edition. See "MySQL for Data Replication" on page 114.
MySQL Cluster and MySQL Cluster CG	7.0: starting with 7.0.7 7.1: starting with 7.1.0 7.2: starting with 7.2.0	■ Multiple master, scalable ■ Global zone, zone cluster
NFS	V3 V4	■ Failover ■ Global zone

Application	Application Version	Comments for Oracle Solaris Cluster 4.2 on SPARC
Oracle Business Intelligence Enterprise Edition	10.1.3: starting with 10.1.3.0 11.1.1.7	■ Failover, multiple master ■ Global zone, zone cluster
Oracle Database (HA-Oracle)	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2	■ Failover ■ Global zone, zone cluster ■ 11.2.0.3, 11.2.0.4: See Table 32, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 SPARC," on page 70 ■ 12.1.0.1, 12.1.0.2: See Table 30, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 SPARC," on page 69
Oracle E-Business Suite	12.1.3	■ Failover ■ Global zone, zone cluster
Oracle External Proxy	N/A	■ Failover, multiple master ■ Global zone, zone cluster ■ Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC) running on Solaris (SPARC or x64) ■ DONE.Interrogates remote 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC) running on Oracle Linux on the following platforms: Oracle servers, Oracle Exadata, Oracle Database Appliance ■ Can be used to monitor 12c RAC Pluggable Databases
Oracle GlassFish Server Message Queue	4.5.2	■ Failover ■ Global zone, zone cluster
Oracle GoldenGate	11.2.1, 12.1.2.x, 12.2.0.x	■ Failover ■ Global zone, zone cluster
Oracle iPlanet Web Server	7.0.15	■ Failover ■ Global zone, zone cluster
Oracle JD Edwards EnterpriseOne Enterprise Server	9.1.2, 9.1.3, 9.1.4	■ Failover, multiple instance, multiple master ■ Global zone, zone cluster
Oracle Real Application Clusters (RAC) Enterprise Edition	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2	■ Global zone, zone cluster ■ Supports administrator and policy managed databases ■ 11.2.0.3, 11.2.0.4: See Table 36, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 SPARC," on page 72 ■ 12.1.0.1, 12.1.0.2: See Table 34, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 SPARC," on page 71
Oracle Siebel	8.2.2.2	■ Failover ■ Global zone, zone cluster
Oracle Solaris Zones	Brand types:	■ Failover, multiple master

Application	Application Version	Comments for Oracle Solaris Cluster 4.2 on SPARC
	`solaris`, `solaris10`, and `solaris-kz`	■ Global zone

Oracle TimesTen	11g:
	
	■ 11.2.2.x
		■ Failover, scalable
		■ Global zone, zone cluster
		■ Supported configurations:
		  ■ `failover master`
		  ■ `scalable /multiple master`
		  ■ `active-active`
		■ Not supported: Active-standby

Oracle Traffic Director	11.1.1.7	■ Failover ■ Global zone, zone cluster ■ Supported in Engineered Systems only
Oracle VM Server for SPARC	3.0 3.1, 3.1.1, 3.1.1.1, 3.1.1.2 3.2, 3.2.0.1 3.3, 3.3.0.1	■ Failover ■ Global zone, zone cluster ■ See "Support for Oracle VM Server for SPARC" on page 26 for additional information
Oracle Web Tier	11.1.1.4, 11.1.1.5	■ Failover ■ Global zone, zone cluster
Oracle WebLogic Server	10.3.3, 10.3.4, 10.3.5, 10.3.6 12.1.1.0, 12.1.2.0, 12.1.3.0	■ Failover, multiple master, multi-instance ■ Global zone, zone cluster ■ Sockets Direct Protocol (SDP) support: ■ 10.3.5 and 10.3.6 are supported in Engineered Systems
PeopleSoft Application Server	PeopleTools 8.52, 8.53	■ Failover ■ Global zone, zone cluster
PeopleSoft Process Scheduler	PeopleTools 8.52, 8.53	■ Failover ■ Global zone, zone cluster
PostgreSQL	9.0.x, 9.1.x, 9.2.x, 9.3.x, 9.4.x, 9.5.x	■ Failover ■ Failover zone, global zone, zone cluster
Samba	3.6.6, 3.6.12 and 3.6.23 as shipped with Oracle Solaris 11.1 or Oracle Solaris 11.2	■ Samba (smbc, nmbd): Failover ■ Winbind: Failover ■ Global zone, zone cluster
SAP liveCache	7.7, 7.9	■ Failover ■ Global zone, zone cluster
SAP MaxDB	7.8, 7.9	■ Failover ■ Global zone, zone cluster
SAP NetWeaver	Versions that run on SAP kernels:	■ Failover, multiple master ■ Global zone, zone cluster

Application	Application Version	Comments for Oracle Solaris Cluster 4.2 on SPARC
	■ 720_EXT, minimum patch level 300 ■ 721_EXT, minimum patch level 130 ■ 722, minimum patch level 25 ■ 740, minimum patch level 36 ■ 741, minimum patch level 11 ■ 742, minimum patch level 28 ■ 745, minimum patch level 15	■ SAP certified. For information, see: 　■ www.sap.com – Click on Our Partners and then Find an SAP Partner. Expand Partner Information Center (PIC) and click on Partner Information Center. Select the Search for Solutions tab and search for "Solaris Cluster" as the Solution Name. Click on Solaris Cluster 4. 　■ SAP Note 1740958 – Central Note: SAP on Solaris Cluster 4.x and Solaris 11 ■ Supports all SAP versions based on the listed kernels, e.g., SAP NetWeaver 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3. 7.1, 7.1 EHP1, 7.3, 7.3 EHP1, 7.4, and all products based on those, e.g., 　■ SAP Customer Relationship Management 6.0 (CRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3 　■ SAP Enterprise Resource Planning 6.0, 6.0 EHP1, 6.0 HEP2, 6.0 EHP3, 6.0 EHP4, 6.0 EHP5, 6.0 EHP6, 6.0 EHP7 　■ SAP NetWeaver Composition Environment 7.1, 7.1 EHP1, 7.2 　■ SAP NetWeaver J2EE (Advanced) Adapter Engine 7.0, 7.0 EPH1, 7.0 EPH2, 7.3, 7.3 EPH1, 7.4 　■ SAP NetWeaver Mobile Infrastructure 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3 EHP1, 7.4 　■ SAP NetWeaver Partner Connectivity Kit 7.0, 7.0 EPH1, 7.0 EPH2, 7.3 　■ SAP NetWeaver Process Integration 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3, 7.3 EPH1, 7.4 　■ SAP NetWeaver Process Orchestration 7.3 EPH1, 7.4 　■ SAP Solution Manager 7.0 EHP1, 7.1 　■ SAP Supplier Relationship Management 5.0, 6.0 (SRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3 　■ SAP Supply Chain Management 5.1 (SCM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
Sybase Adaptive Server Enterprise (ASE)	15.7	■ Failover ■ Global zone, zone cluster ■ Supported in HA mode only – both asymmetric and symmetric ■ The Companion Server feature is not supported

TABLE 29   Data Services for Oracle Solaris Cluster 4.2 on x64

Application	Application Version	Comments for Oracle Solaris Cluster 4.2 on x64
Apache Tomcat	6.0: starting with 6.0.28 7.0: starting with 7.0.06	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster
Apache Web Server	2.2.x 2.4.x	■ Failover, scalable ■ Global zone, zone cluster

Application	Application Version	Comments for Oracle Solaris Cluster 4.2 on x64
		■ Both non-SSL-aware Apache and SSL-aware Apache are supported. Notes for configuring SSL-aware Apache with this data service is in Oracle Bug 20525331 available in MOS. ■ 2.2.x shipped with Oracle Solaris 11.1, Oracle Solaris 11.2 or Oracle Solaris 11.3, and the same versions from the Apache web site ■ 2.4.x versions from the Apache web site
Domain Name Service (DNS)	N/A	■ Failover ■ Global zone, zone cluster
Dynamic Host Configuration Protocol (DHCP)	N/A	■ Failover ■ Global zone
Generic Data Service (GDS) (SUNW.gds)	N/A	■ Failover, multiple master, scalable ■ Global zone, zone cluster
Generic Data Service version 2 (GDSv2) (ORCL.gds and ORCL.gds_proxy)	N/A	■ Failover, multiple master, scalable, proxy ■ Global zone, zone cluster
MySQL: ■ MySQL Community Edition ■ MySQL Standard Edition ■ MySQL Enterprise Edition	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6, 5.7	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster ■ MySQL 5.7 requires Oracle Solaris 11.2 (and SRUs) or 11.3 (and SRUs) ■ Data service supports MySQL replication in Oracle Solaris Cluster Geographic Edition. See "MySQL for Data Replication" on page 114.
MySQL Cluster and MySQL Cluster CGE	7.0: starting with 7.0.7 7.1: starting with 7.1.0 7.2: starting with 7.2.0	■ Multiple master, scalable ■ Global zone, zone cluster
NFS	V3 V4	■ Failover ■ Global zone
Oracle Database (HA-Oracle)	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2	■ Failover ■ Global zone, zone cluster ■ 11.2.0.3, 11.2.0.4: Details in Table 33, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 x64," on page 70 ■ 12.1.0.1, 12.1.0.2: Details in Table 31, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 x64," on page 69

Application	Application Version	Comments for Oracle Solaris Cluster 4.2 on x64
Oracle External Proxy	N/A	■ Failover, multiple master ■ Global zone, zone cluster ■ Interrogates remote 10gR2, 11gR1, 11gR2 and 12cR1 Oracle databases (single instance or RAC) running on Solaris (SPARC or x64) ■ Interrogates remote 11gR2 and 12cR1 Oracle databases (single instance or RAC) running on Oracle Linux on the following platforms: Oracle servers, Oracle Exadata, Oracle Database Appliance ■ Can be used to monitor 12c RAC Pluggable Databases
Oracle GlassFish Server Message Queue	4.5.2	■ Failover ■ Global zone, zone cluster
Oracle GoldenGate	11.2.1, 12.1.2.x, 12.2.0.x	■ Failover ■ Global zone, zone cluster
Oracle iPlanet Web Server	7.0.15	■ Failover ■ Global zone, zone cluster
Oracle Real Application Clusters (RAC) Enterprise Edition	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2	■ Global zone, zone cluster ■ Supports administrator and policy managed databases ■ 11.2.0.3, 11.2.0.4: Details in Table 37, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 x64," on page 73 ■ 12.1.0.1, 12.1.0.2: Details in Table 35, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 x64," on page 72
Oracle Solaris Zones	Brand types: `solaris`, `solaris10`, and `solaris-kz`	■ Failover, multiple master ■ Global zone

Oracle TimesTen	11g:
	■ 11.2.2.x
		■ Failover, scalable
		■ Global zone, zone cluster
		■ Supported configurations:
		  ■ `failover master`
		  ■ `scalable`/`multiple master`
		  ■ `active-active`
		■ Not supported: Active-standby

Oracle Traffic Director	11g: ■ 11.2.2.x	■ Failover ■ Global zone, zone cluster ■ Supported in Engineered Systems only
Oracle Web Tier	11.1.1.4, 11.1.1.5	■ Failover ■ Global zone, zone cluster
Oracle WebLogic Server	10.3.3, 10.3.4, 10.3.5, 10.3.6	■ Failover, multiple master, multi-instance ■ Global zone, zone cluster ■ Sockets Direct Protocol (SDP) support:

Application	Application Version	Comments for Oracle Solaris Cluster 4.2 on x64
	12.1.1.0, 12.1.2.0, 12.1.3.0	■ 10.3.5 and 10.3.6 are supported in Engineered Systems
PostgreSQL	9.0.x, 9.1.x, 9.2.x, 9.3.x, 9.4.x, 9.5.x	■ Failover ■ Failover zone, global zone, zone cluster
Samba	3.6.6, 3.6.12 and 3.6.23 as shipped with Oracle Solaris 11.1 or Oracle Solaris 11.2	■ Samba (smbc, nmbd): Failover ■ Winbind: Failover ■ Global zone, zone cluster
SAP liveCache	7.7, 7.9	■ Failover ■ Global zone, zone cluster
SAP MaxDB	7.8, 7.9	■ Failover ■ Global zone, zone cluster
SAP NetWeaver	Versions that run on SAP kernels: ■ 720_EXT, minimum patch level 300 ■ 721_EXT, minimum patch level 130 ■ 722, minimum patch level 25 ■ 740, minimum patch level 36 ■ 741, minimum patch level 11 ■ 742, minimum patch level 28 ■ 745, minimum patch level 15	■ Failover, multiple master ■ Global zone, zone cluster ■ See SAP NetWeaver entry in Table 28, "Data Services for Oracle Solaris Cluster 4.2 on SPARC," on page 62
Sybase Adaptive Server Enterprise (ASE)	15.7	■ Failover ■ Global zone, zone cluster ■ Supported in HA mode only – both asymmetric and symmetric ■ The Companion Server feature is not supported

Oracle Database on Oracle Solaris Cluster 4.2

The following tables contain supplemental HA-Oracle information for Table 28, "Data Services for Oracle Solaris Cluster 4.2 on SPARC," on page 62 and Table 29, "Data Services for Oracle Solaris Cluster 4.2 on x64," on page 65:

TABLE 30   HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 SPARC

HA-Oracle 12c Release 1 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
UFS	Y	Y	Y	Y	Y
QFS	Y	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y	Y
PxFS	Y	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y	Y
ACFS	Y	N/A	Y	Y[b]	Y
Clustered ASM	Y	Y	Y	Y[b]	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle Database 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 31   HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 x64

HA-Oracle 12c Release 1 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
UFS	Y	Y	Y	Y
QFS	Y	Y	Y	Y

HA-Oracle 12c Release 1 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
ZFS	Y	N/A	Y	Y
PxFS	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y
ACFS	Y	N/A	Y	Y[b]
Clustered ASM	Y	Y	Y	Y[b]
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle Database 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 32   HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 SPARC

HA-Oracle 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
UFS	Y	Y	Y	Y	Y
QFS	Y	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y	Y
PxFS	Y	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y	Y
ACFS[b]	Y	N/A	Y	Y	Y
Clustered ASM	Y	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

TABLE 33   HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 x64

HA-Oracle 11g Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
UFS	Y	Y	Y	Y
QFS	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y
PxFS	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y
ACFS	Y	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y

HA-Oracle 11g Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle 11.2.0.4 required for ACFS support

Oracle Real Application Clusters on Oracle Solaris Cluster 4.2

Oracle Real Application Clusters (RAC) Enterprise Edition is supported with Oracle Solaris Cluster. Refer to the following tables for Oracle RAC support details. These tables contain supplemental information to Table 28, "Data Services for Oracle Solaris Cluster 4.2 on SPARC," on page 62 and Table 29, "Data Services for Oracle Solaris Cluster 4.2 on x64," on page 65:

- Table 34, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 SPARC," on page 71
- Table 35, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 x64," on page 72
- Table 36, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 SPARC," on page 72
- Table 37, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 x64," on page 73
- Table 38, "Oracle RAC Reliable Datagram Sockets (RDS) v3 Matrix for Oracle Solaris Cluster 4.2 SPARC," on page 73
- Table 39, "Oracle RAC Reliable Datagram Sockets (RDS) v3 Matrix for Oracle Solaris Cluster 4.2 x64," on page 73

TABLE 34   Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 SPARC

Oracle RAC 12c Release 1 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
Shared QFS	Y^b	$Y^{b, c}$	Y^b	$Y^{b, e}$	Y^b
NFS Appliance[a]	N/A	N/A	Y^b	$Y^{b, e}$	Y^b
ACFS	Y^b	N/A	Y^b	$Y^{b, e}$	Y^b
Clustered ASM	Y	$Y^{c, d}$	Y	Y^e	Y
Solaris Volume Manager	$Y^{c, d}$	N/A	$Y^{c, d}$	$Y^{c, d, e}$	$Y^{c, d}$
HW RAID	N/A	N/A	Y^b	$Y^{b, e}$	Y^b

- a – Includes Direct NFS (dNFS) support
- b – Oracle RAC 12.1.0.2.0 starts with Oracle Solaris Cluster 4.2 SRU 4
- c – Starts with Oracle Solaris Cluster 4.2 SRU 3 and Oracle Solaris 11.2 SRU 6
- d – Oracle RAC 12.1.0.2.0 starts with Oracle Solaris Cluster 4.2 SRU 4 if using Solaris Volume Manager OBAN filesystem for the RAC database.
- e – Oracle RAC 12.1.0.2.0 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 35   Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.2 x64

Oracle RAC 12c Release 1 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
Shared QFS	Y^b	$Y^{b, c}$	Y^b	$Y^{b, e}$
NFS Appliance[a]	N/A	N/A	Y^b	$Y^{b, e}$
ACFS	Y^b	N/A	Y^b	$Y^{b, e}$
Clustered ASM	Y	$Y^{c, d}$	Y	Y^e
Solaris Volume Manager	$Y^{c, d}$	N/A	$Y^{c, d}$	$Y^{c, d, e}$
HW RAID	N/A	N/A	Y^b	$Y^{b, e}$

- a – Includes Direct NFS (dNFS) support
- b – Oracle RAC 12.1.2.0 starts with Oracle Solaris Cluster 4.2 SRU 4
- c – Starts with Oracle Solaris Cluster 4.2 SRU 3 and Oracle Solaris 11.2 SRU 6
- d – Oracle RAC 12.1.0.2.0 starts with Oracle Solaris Cluster 4.2 SRU 4 if using Solaris Volume Manager OBAN filesystem for the RAC database.
- e – Oracle RAC 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 36   Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 SPARC

Oracle RAC 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
Shared QFS	Y	Y^c	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y	Y
ACFS[b]	Y	N/A	Y	Y	Y
Clustered ASM	Y	Y^c	Y	Y	Y
Solaris Volume Manager	Y^c	N/A	Y^c	Y^c	Y^c
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support

- b – Oracle 11.2.0.4 required for ACFS support
- c – Starts with Oracle Solaris Cluster 4.2 SRU 3 and Oracle Solaris 11.2 SRU 6

TABLE 37   Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.2 x64

Oracle RAC 11g Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
Shared QFS	Y	Y[c]	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y
ACFS[b]	Y	N/A	Y	Y
Clustered ASM	Y	Y[c]	Y	Y
Solaris Volume Manager	Y[c]	N/A	Y[c]	Y[c]
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle 11.2.0.4 required for ACFS support
- c – Starts with Oracle Solaris Cluster 4.2 SRU 3 and Oracle Solaris 11.2 SRU 6

TABLE 38   Oracle RAC Reliable Datagram Sockets (RDS) v3 Matrix for Oracle Solaris Cluster 4.2 SPARC

Oracle RAC Version(s)	Global Zone	Zone Cluster	Oracle VM Server for SPARC
12.1.0.1, 12.1.0.2	Y	Y	Y
11.2.0.3, 11.2.0.4	Y	Y	Y

TABLE 39   Oracle RAC Reliable Datagram Sockets (RDS) v3 Matrix for Oracle Solaris Cluster 4.2 x64

Oracle RAC Version(s)	Global Zone	Zone Cluster
12.1.0.1, 12.1.0.2	Y	Y
11.2.0.3, 11.2.0.4	Y	Y

TABLE 40   Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.2 SPARC

Data Service	Application Version	Comments
Generic Data Service (GDS) based services	N/A	- Failover, multiple master, scalable - A GDS-based data service can run in a `solaris10` branded Zone Cluster provided that the application is also configured to run in a `solaris10` branded zone
HA for Alliance Access	7.0	Failover

Data Service	Application Version	Comments
HA for Alliance Gateway	7.0	Failover
HA for Apache	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Proxy Server	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Tomcat	3.3 4.0, 4.1 5.0, 5.5, 5.5.x 6.0 7.0.x	Failover, multiple master, scalable
HA for Business Intelligence Enterprise Edition	10.1.3.x (for x >= 0)	Failover, multiple master (integrated with OBIEE built-in clustering)
HA for Domain Name Service (DNS)	Version shipped with Oracle Solaris	Failover
HA E-Business Suite	11.5.8, 11.5.9, 11.5.10 - 11.5.10cu 212.0, 12.1.x	Failover, multiple master, scalable (Parallel Concurrent Processing)
HA for Informix	V9.4 10 11, 11.5	Failover
HA for MySQL	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6	Failover, multiple master, scalable
HA for MySQL Cluster	7.0.x (for x >= 7) 7.1.x (for x >= 0) 7.2.x (for x >= 0)	Failover
HA for Oracle	10g Release 2:	■ Failover ■ Zone Cluster requirements:

Data Service	Application Version	Comments
	■ 10.2.0.4, 10.2.0.5	■ Oracle Solaris Cluster 3.3 5/11 + patch ■ Oracle Solaris Cluster 3.3 3/13 ■ Global Zone requirements: 　■ Oracle Solaris 11.2 　■ Oracle Solaris 11.3
HA for Oracle Application Server	9.0.2 - 9.0.3 (10g) 9.0.4 - 10.1.3.1	Failover
HA for Oracle External Proxy	N/A	■ Failover, multiple master ■ Proxies a remote Oracle DB/RAC to reflect the DB state/status as a RGM resource state/status ■ Remote Oracle DB/RAC must be on Oracle Solaris (SPARC or x86) ■ Interrogates remote 10gR2, 11gR1, 11gR2, and 12cR1 Oracle databases (single instance or RAC)
HA for Oracle Web Tier	11.1.1.x	Failover
HA for Oracle WebLogic Server	10.3, 10.3.3, 10.3.4, 10.3.5, 10.3.6	■ Failover, multiple master (clustered WLS) ■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11
HA for PeopleSoft Application Server	PeopleTools 8.50, 8.51, 8.52	■ Failover ■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11
HA for PeopleSoft Process Scheduler	PeopleTools 8.50, 8.51, 8.52	Failover
HA for PostgreSQL	7.3.x 8.0.x, 8.1.x, 8.2.x, 8.3.x, 8.4.x 9.0.x, 9.1.x, 9.2.x	Failover
HA for Samba	2.2.2 - 3.5.5	■ Failover ■ "Clustered" Samba is not supported
HA for SAP liveCache	7.4, 7.5, 7.6, 7.7	■ Failover ■ 7.6 needs at least 7.6.03.09 ■ 7.7 needs at least 7.7.07.14 (with SCM 7.0) ■ 7.7.04.38 and later supported with SCM 5.1 **Note -** SAP note 1461682 specifies corrective steps to make at install time.
HA for SAP MaxDB	7.4, 7.5, 7.6, 7.7, 7.8	■ Failover ■ 7.6 needs at least MaxDB 7.6.03.09 for S10 SPARC ■ 7.8 support requires at least patch 147091-05

Data Service	Application Version	Comments

HA for SAP NetWeaver	Versions that run on SAP kernels:
	
	■ 720 or 720_EXT, minimum patch level 300
	■ 721 or 721_EXT, minimum patch level 130
	■ 740, minimum patch level 36
	■ 741, minimum patch level 11
	■ 742, minimum patch level 28
		■ Failover, multiple master
		■ SAP certified. For information, see:
		
		  ■ www.sap.com – Click on Our Partners and then Find an SAP Partner. Expand Partner Information Center (PIC) and click on Partner Information Center. Select the Search for Solutions tab and search for "Solaris Cluster" as the Solution Name. Click on Solaris Cluster 3.3.
		  ■ SAP Note 1740305 – Central Note: HA SAP systems on Solaris Cluster 3.3
		■ Supports all SAP versions based on the listed kernels, e.g., SAP NetWeaver 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3. 7.1, 7.1 EHP1, 7.3, 7.3 EHP1, 7.4, and all products based on those, e.g.,
		■ SAP Customer Relationship Management 6.0 (CRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
		■ SAP Enterprise Resource Planning 6.0, 6.0 EHP1, 6.0 HEP2, 6.0 EHP3, 6.0 EHP4, 6.0 EHP5, 6.0 EHP6, 6.0 EHP7
		■ SAP NetWeaver Composition Environment 7.1, 7.1 EHP1, 7.2
		■ SAP NetWeaver J2EE (Advanced) Adapter Engine 7.0, 7.0 EPH1, 7.0 EPH2, 7.3, 7.3 EPH1, 7.4
		■ SAP NetWeaver Mobile Infrastructure 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3 EHP1, 7.4
		■ SAP NetWeaver Partner Connectivity Kit 7.0, 7.0 EPH1, 7.0 EPH2, 7.3
		■ SAP NetWeaver Process Integration 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3, 7.3 EPH1, 7.4
		■ SAP NetWeaver Process Orchestration 7.3 EPH1, 7.4
		■ SAP Solution Manager 7.0 EHP1, 7.1
		■ SAP Supplier Relationship Management 5.0, 6.0 (SRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
		■ SAP Supply Chain Management 5.1 (SCM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3

HA for Siebel	8.0, 8.1.1, 8.2.2	Failover
HA for Sun GlassFish Message Queue, formerly HA for Sun Java System Message Queue and HA for Sun One Message Queue	4.4, 4.4u1, 4.5	Failover
HA for Sun Java System Application Server	All versions until JES 5 U1, 9.1, 9.1 UR2, GlassFish V2 UR2	Failover
HA for Sun Java System Web Proxy Server	Up to and including 4.0	Failover

Data Service	Application Version	Comments
HA for Sun Java System Web Server	All versions up to and including JES 5 U1 are supported. All releases up to and including 7.0, 7.0 U1, 7.0 U2 and all future updates of 7.0 release.	Failover, scalable
HA for Sybase Adaptive Server Enterprise (ASE)	15.0, 15.0.1, 15.0.2, 15.0.3 15.7.0	■ Failover ■ Supported in HA mode only – both asymmetric and symmetric ■ The Companion Server feature is not supported ■ Application version 15.7.0 is supported on UFS and ZFS
HA for TimesTen	11.2.1.x (for x >= 4) 11.2.2.x	■ Failover, scalable ■ Supported configurations: 　■ failover master 　■ scalable / multi master 　■ active-active ■ Not supported: active-standby
HA for WebSphere Message Broker	5.0 6.0 7.0	Failover
HA for WebSphere MQ	5.3 6.0 7.0	Failover
Oracle Real Application Clusters (RAC) Enterprise Edition	10g Release 2: ■ 10.2.0.5 11g Release 1: ■ 11.1.0.7 11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4	■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11 ■ 10.2.0.5, 11.1.0.7: 　■ Zone Cluster requirements: 　　■ Oracle Solaris Cluster 3.3 5/11, or Oracle Solaris Cluster 3.3 3/13, with at least patches 145333-23 and 145335-17 　　■ At least Oracle Solaris 10 1/13 　■ Global Zone requirements: 　　■ Oracle Solaris 11.1 starting with SRU 8, or Oracle Solaris 11.2 ■ 11.2.0.3, 11.2.0.4: 　■ Zone Cluster requirements: 　　■ No UDLM 　　■ No SVM 　　■ Oracle Solaris Cluster 3.3 5/11 + patches, or Oracle Solaris Cluster 3.3 3/13 　■ Global Zone requirements:

Data Service	Application Version	Comments
		■ Oracle Solaris 11.1, or Oracle Solaris 11.2 starting with SRU 1

TABLE 41   Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.2 x64

Data Service	Application Version	Comments
Generic Data Service (GDS) based services	N/A	■ Failover, multiple master, scalable ■ A GDS-based data service can run in a `solaris10` branded Zone Cluster provided that the application is also configured to run in a `solaris10` branded zone
HA for Apache	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Proxy Server	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Tomcat	3.3 4.0, 4.1 5.0, 5.5, 5.5.x 6.0 7.0.x	Failover, multiple master, scalable
HA for Domain Name Service (DNS)	Version shipped with Oracle Solaris	Failover
HA for Informix	V9.4 10 11, 11.5	Failover
HA for MySQL	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6	Failover, multiple master, scalable
HA for MySQL Cluster	7.0.x (for x >= 7) 7.1.x (for x >= 0)	Failover

Data Service	Application Version	Comments
	7.2.x (for x >= 0)	
HA for Oracle	10g Release 2: ■ 10.2.0.4, 10.2.0.5	■ Failover ■ 10g Release 2 zone cluster requirements: 　■ Oracle Solaris Cluster 3.3 5/11 + patch or Oracle Solaris Cluster 3.3 3/13 ■ 10g Release 2 global zone requirements: 　■ Oracle Solaris 11.1 or Oracle Solaris 11.2
HA for Oracle Application Server	10.1.2, 10.1.3.1	Failover
HA for Oracle External Proxy	N/A	■ Failover, multiple master ■ Proxies a remote Oracle DB/RAC to reflect the DB state/status as a RGM resource state/status ■ Remote Oracle DB/RAC must be on Oracle Solaris (SPARC or x86) ■ Interrogates remote 10gR2, 11gR1, 11gR2, and 12cR1 Oracle databases (single instance or RAC)
HA for Oracle Web Tier	11.1.1.x	Failover
HA for Oracle WebLogic Server	10.3, 10.3.3, 10.3.4, 10.3.5, 10.3.6	■ Failover, multiple master (clustered WLS) ■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11
HA for PostgreSQL	7.3.x 8.0.x, 8.1.x, 8.2.x, 8.3.x, 8.4.x 9.0.x, 9.1.x, 9.2.x	Failover
HA for Samba	2.2.2 - 3.5.5	■ Failover ■ "Clustered" Samba is not supported
HA for SAP liveCache	7.6, 7.7	■ Failover ■ 7.6 needs at least 7.6.01.09 ■ 7.7 needs at least 7.7.07.14 (with SCM 7.0) ■ 7.7.04.38 and later supported with SCM 5.1 **Note -** SAP note 1461682 specifies corrective steps to make at install time.
HA for SAP MaxDB	7.6, 7.7, 7.8	■ Failover ■ 7.6 needs at least 7.6.01.09 ■ 7.8 support requires at least patch 147092-05
HA for SAP NetWeaver	Versions that run on SAP kernels: ■ 720 or 720_EXT, minimum patch level 300	■ Failover, multiple master ■ See SAP NetWeaver entry in Table 26, "Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.3 on SPARC," on page 54

Data Service	Application Version	Comments
	■ 721 or 721_EXT, minimum patch level 130 ■ 740, minimum patch level 36 ■ 741, minimum patch level 11 ■ 742, minimum patch level 28	
HA for Sun GlassFish Message Queue, formerly HA for Sun Java System Message Queue and HA for Sun One Message Queue	4.4, 4.4.u1	Failover
HA for Sun Java System Application Server	All versions until JES 5 U1, 9.1, 9.1 UR2, GlassFish V2 UR2	Failover
HA for Sun Java System Web Proxy Server	Up to and including 4.0	Failover
HA for Sun Java System Web Server	All versions up to and including JES 5 U1 are supported. All releases up to and including 7.0, 7.0 U1, 7.0 U2 and all future updates of 7.0 release.	Failover, scalable
HA for Sybase Adaptive Server Enterprise (ASE)	15.0, 15.0.1, 15.0.2, 15.0.3	Failover

HA for TimesTen	11.2.1.x (for x >= 4)
	
	11.2.2.x
		■ Failover, scalable
		■ Supported configurations:
		  ■ failover master
		  ■ scalable / multi master
		  ■ active-active
		■ Not supported: active-standby

HA for WebSphere Message Broker	6.0 7.0	Failover
HA for WebSphere MQ	6.0 7.0	Failover

Data Service	Application Version	Comments
Oracle Real Application Clusters (RAC) Enterprise Edition	10g Release 2: ■ 10.2.0.5 11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4	■ 10.2.0.5: - Zone Cluster requirements: - Oracle Solaris Cluster 3.3 5/11 + patches or Oracle Solaris Cluster 3.3 3/13 - Global Zone requirements: - Oracle Solaris 11.1 ■ 11.2.0.3, 11.2.0.4: - Zone Cluster requirements: - No UDLM - No SVM - Oracle Solaris Cluster 3.3 5/11 + patches or Oracle Solaris Cluster 3.3 3/13 - Global Zone requirements: - Oracle Solaris 11.2 starting with SRU 1 or Oracle Solaris 11.3

◆ ◆ ◆   **C H A P T E R   5**

5

Data Service Support for Oracle Solaris Cluster 4.1

This chapter covers data service support for Oracle Solaris Cluster 4.1.

Application Services on Oracle Solaris Cluster 4.1

An application service is an application along with a data service which makes the application highly available or scalable in Oracle Solaris Cluster.

Data Services – All Oracle Solaris Cluster 4.1 data services are supported in the global zone. Many data services are supported with the Oracle Solaris HA-container data service failover zone and Zone Cluster as noted in the following tables:

- Table 42, "Data Services for Oracle Solaris Cluster 4.1 on SPARC," on page 84
- Table 43, "Data Services for Oracle Solaris Cluster 4.1 on x64," on page 87

All Oracle Solaris Cluster 4.1 data services are supported with IPv4 only.

Zone Clusters – Oracle Solaris Cluster 4.1 Zone Clusters support both `solaris` and `solaris10` branded zones. The "zone cluster" notation in the Data Services tables indicates the `solaris` brand. `solaris10` branded zones are supported with Oracle Solaris Cluster 3.3 3/13 data services, and some Oracle Solaris Cluster 3.3 5/11 data services, as indicated in the following tables.

- Table 52, "Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.1 SPARC," on page 94
- Table 53, "Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.1 x64," on page 98

TABLE 42   Data Services for Oracle Solaris Cluster 4.1 on SPARC

Application	Application Version	Comments for Oracle Solaris Cluster 4.1 on SPARC
Apache Tomcat	6.0: starting with 6.0.28 7.0: starting with 7.0.06	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster
Apache Web Server	2.2.x 2.4.x	■ Failover, scalable ■ Global zone, zone cluster ■ 2.2.x shipped with Oracle Solaris 11.1, Oracle Solaris 11.2 or Oracle Solaris 11.3, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
Domain Name Service (DNS)	N/A	■ Failover ■ Global zone, zone cluster
Dynamic Host Configuration Protocol (DHCP)	N/A	■ Failover ■ Global zone
Generic Data Service (GDS) (SUNW.gds)	N/A	■ Failover, multiple master, scalable ■ Global zone, zone cluster
MySQL: ■ MySQL Community Edition ■ MySQL Standard Edition ■ MySQL Enterprise Edition	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1. x, 5.5, 5.6, 5.7	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster ■ MySQL 5.7 requires Oracle Solaris 11.2 (and SRUs) or 11.3 (and SRUs) ■ Data service supports MySQL replication in Oracle Solaris Cluster Geographic Edition. See "MySQL for Data Replication" on page 114.
MySQL Cluster and MySQL Cluster CGE	7.0: starting with 7.0.7 7.1: starting with 7.1.0 7.2: starting with 7.2.0	■ Multiple master, scalable ■ Global zone, zone cluster
NFS	V3 V4	■ Failover ■ Global zone
Oracle Database (HA-Oracle)	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1:	■ Failover ■ Global zone, zone cluster ■ 11.2.0.3, 11.2.0.4: Details in Table 47, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 x64," on page 92 ■ 12.1.0.1, 12.1.0.2:

Application	Application Version	Comments for Oracle Solaris Cluster 4.1 on SPARC
	■ 12.1.0.1 ■ 12.1.0.2	■ Starts with Oracle Solaris Cluster 4.1 SRU 3 ■ Details in Table 44, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 SPARC," on page 91
Oracle E-Business Suite	12.1.3	■ Failover ■ Global zone, zone cluster
Oracle External Proxy	N/A	■ Failover, multiple master ■ Global zone, zone cluster ■ Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC) running on Solaris (SPARC or x64)
Oracle GlassFish Server Message Queue	4.5.2	■ Failover ■ Global zone, zone cluster
Oracle iPlanet Web Server	7.0.15	■ Failover ■ Global zone, zone cluster
Oracle Real Application Clusters (RAC) Enterprise Edition	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2	■ Global zone, zone cluster ■ 11.2.0.3, 11.2.0.4: Details in Table 50, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 SPARC," on page 93 ■ 12.1.0.1, 12.1.0.2: 　■ Starts with Oracle Solaris Cluster 4.1 SRU 7 　■ Details in Table 48, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 SPARC," on page 93
Oracle Siebel	8.2.2.2	■ Failover ■ Global zone, zone cluster ■ Requires at least Oracle Solaris Cluster 4.1 SRU 3
Oracle Solaris Zones	Brand types: `solaris`, and `solaris10`	■ Failover, multiple master ■ Global zone
Oracle TimesTen	11g: ■ 11.2.2.x	■ Failover, scalable ■ Global zone, zone cluster ■ Supported configurations: 　■ `failover master` 　■ `scalable`/`multiple master` 　■ `active-active` ■ Not supported: Active-standby ■ Requires at least Oracle Solaris Cluster 4.1 SRU 3
Oracle Traffic Director	11g: ■ 11.2.2.x	■ Failover ■ Global zone, zone cluster ■ 11.1.1.7 requires at least Oracle Solaris Cluster 4.1 SRU 3 ■ Supported in Engineered Systems only

Application	Application Version	Comments for Oracle Solaris Cluster 4.1 on SPARC
Oracle VM Server for SPARC	2.2 3.03.1, 3.1.1, 3.1.1.1, 3.1.1.2 3.2, 3.2.0.1	■ Failover ■ Global zone ■ Details in "Support for Oracle VM Server for SPARC" on page 26 for additional information
Oracle Web Tier	11.1.1.4, 11.1.1.5	■ Failover ■ Global zone, zone cluster
Oracle WebLogic Server	10.3.3, 10.3.4, 10.3.5, 10.3.6 12.1.1.0, 12.1.2	■ Failover, multiple master, multi-instance ■ Global zone, zone cluster ■ Sockets Direct Protocol (SDP) support: ■ 10.3.5 and 10.3.6 are supported in Engineered Systems ■ 12.1.2 requires at least Oracle Solaris Cluster 4.1 SRU 7
PeopleSoft Application ServerPeopleTools 8.52	PeopleTools 8.52	■ Failover ■ Global zone, zone cluster
PeopleSoft Process Scheduler	PeopleTools 8.52	■ Failover ■ Global zone, zone cluster
PostgreSQL	9.0.x, 9.1.x, 9.2.x, 9.3.x,	■ Failover ■ Failover zone, global zone, zone cluster ■ 9.x.x requires at least Oracle Solaris Cluster 4.1 SRU 3
Samba	3.6.6, and 3.6.12 as shipped with Oracle Solaris 11.1	■ Samba (smbc, nmbd): Failover ■ Winbind: Failover ■ Global zone, zone cluster ■ Requires at least Oracle Solaris Cluster 4.1 SRU 3
SAP liveCache	7.7, 7.9	■ Failover ■ Global zone, zone cluster ■ Requires at least Oracle Solaris Cluster 4.1 SRU 3
SAP MaxDB	7.8, 7.9	■ Failover ■ Global zone, zone cluster ■ Requires at least Oracle Solaris Cluster 4.1 SRU 3

SAP NetWeaver	Versions that run on SAP kernels:
	
	■ 720_EXT, minimum patch level 300
	■ 721_EXT, minimum patch level 130
	■ 722, minimum patch level 25
	■ 740, minimum patch level 36
		■ Failover, multiple master
		■ Global zone, zone cluster
		■ SAP certified. For information, see:
		  ■ https://www.sap.com/index.html – Click on Our Partners and then Find an SAP Partner. Expand Partner Information Center (PIC) and click on Partner Information Center. Select the Search for Solutions tab and search for "Solaris Cluster" as the Solution Name. Click on Solaris Cluster 4.
		  ■ SAP Note 1740958 – Central Note: SAP on Solaris Cluster 4.x and Solaris 11

Application	Application Version	Comments for Oracle Solaris Cluster 4.1 on SPARC
	■ 741, minimum patch level 11 ■ 742, minimum patch level 28 ■ 745, minimum patch level 15	■ Supports all SAP versions based on the listed kernels, e.g., SAP NetWeaver 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3. 7.1, 7.1 EHP1, 7.3, 7.3 EHP1, 7.4, and all products based on those, e.g., 　■ SAP Customer Relationship Management 6.0 (CRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3 　■ SAP Enterprise Resource Planning 6.0, 6.0 EHP1, 6.0 HEP2, 6.0 EHP3, 6.0 EHP4, 6.0 EHP5, 6.0 EHP6, 6.0 EHP7 　■ SAP NetWeaver Composition Environment 7.1, 7.1 EHP1, 7.2 　■ SAP NetWeaver J2EE (Advanced) Adapter Engine 7.0, 7.0 EPH1, 7.0 EPH2, 7.3, 7.3 EPH1, 7.4 　■ SAP NetWeaver Mobile Infrastructure 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3 EHP1, 7.4 　■ SAP NetWeaver Partner Connectivity Kit 7.0, 7.0 EHP1, 7.0 EPH2, 7.3 　■ SAP NetWeaver Process Integration 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3, 7.3 EHP1, 7.4 　■ SAP NetWeaver Process Orchestration 7.3 EPH1, 7.4 　■ SAP Solution Manager 7.0 EHP1, 7.1 　■ SAP Supplier Relationship Management 5.0, 6.0 (SRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3 　■ SAP Supply Chain Management 5.1 (SCM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
Sybase Adaptive Server Enterprise (ASE)	15.7	■ Failover ■ Global zone, zone cluster ■ Supported in HA mode only – both asymmetric and symmetric ■ The Companion Server feature is not supported ■ 15.7 requires at least Oracle Solaris Cluster 4.1 SRU 3

TABLE 43　　Data Services for Oracle Solaris Cluster 4.1 on x64

Application	Application Version	Comments for Oracle Solaris Cluster 4.1 on x64
Apache Tomcat	6.0: starting with 6.0.28 7.0: starting with 7.0.06	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster
Apache Web Server	2.2.x 2.4.x	■ Failover, scalable ■ Global zone, zone cluster ■ 2.2.x shipped with Oracle Solaris 11.1, Oracle Solaris 11.2 or Oracle Solaris 11.3, and the same versions from the Apache web site

Application	Application Version	Comments for Oracle Solaris Cluster 4.1 on x64
		■ **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
Domain Name Service (DNS)	N/A	■ Failover ■ Global zone, zone cluster
Dynamic Host Configuration Protocol (DHCP)	N/A	■ Failover ■ Global zone
Generic Data Service (GDS) (SUNW.gds)	N/A	■ Failover, multiple master, scalable ■ Global zone, zone cluster
MySQL: ■ MySQL Community Edition ■ MySQL Standard Edition ■ MySQL Enterprise Edition	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster ■ 5.6 requires at least Oracle Solaris Cluster 4.1 SRU 3 ■ Data service supports MySQL replication in Oracle Solaris Cluster Geographic Edition. See "MySQL for Data Replication" on page 114.
MySQL Cluster and MySQL Cluster CGE	7.0: starting with 7.0.7 7.1: starting with 7.1.0 7.2: starting with 7.2.0	■ Multiple master, scalable ■ Global zone, zone cluster
NFS	V3 V4	■ Failover ■ Global zone
Oracle Database (HA-Oracle)	11g Release 2: ■ 11.2.0.3 ■ 11.2.0.4 12c Release 1: ■ 12.1.0.1 ■ 12.1.0.2	■ Failover ■ Global zone, zone cluster ■ 11.2.0.3, 11.2.0.4: Details in Table 47, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 x64," on page 92 ■ 12.1.0.1, 12.1.0.2: 　■ Starts with Oracle Solaris Cluster 4.1 SRU 3 　■ Details in Table 45, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 x64," on page 91
Oracle External Proxy	N/A	■ Failover, multiple master ■ Global zone, zone cluster ■ Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC) running on Solaris (SPARC or x64)
Oracle GlassFish Server Message Queue	4.5.2	■ Failover ■ Global zone, zone cluster

Application	Application Version	Comments for Oracle Solaris Cluster 4.1 on x64
Oracle iPlanet Web Server	7.0.15	■ Failover ■ Global zone, zone cluster

Oracle Real Application Clusters (RAC) Enterprise Edition	11g Release 2:
	
	■ 11.2.0.3
	■ 11.2.0.4
	
	12c Release 1:
	
	■ 12.1.0.1
	■ 12.1.0.2
		■ Global zone, zone cluster
		■ 11.2.0.3, 11.2.0.4: Details in Table 51, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 x64," on page 94
		■ 12.1.0.1, 12.1.0.2:
		  ■ Starts with Oracle Solaris Cluster 4.1 SRU 3
		  ■ Details in Table 49, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 x64," on page 93

Oracle Solaris Zones	Brand types: `solaris`, and `solaris10`	■ Failover, multiple master ■ Global zone

Oracle TimesTen	11g:
	
	■ 11.2.2.x
		■ Failover, scalable
		■ Global zone, zone cluster
		■ Supported configurations:
		  ■ `failover master`
		  ■ `scalable`/`multiple master`
		  ■ `active-active`
		■ Not supported: Active-standby

Oracle Traffic Director	11g: ■ 11.2.2.x	■ Failover ■ Global zone, zone cluster ■ 11.1.1.7 requires at least Oracle Solaris Cluster 4.1 SRU 3 ■ Supported in Engineered Systems only
Oracle Web Tier	11.1.1.4, 11.1.1.5	■ Failover ■ Global zone, zone cluster
Oracle WebLogic Server	10.3.3, 10.3.4, 10.3.5, 10.3.6 12.1.1.0, 12.1.2.0	■ Failover, multiple master, multi-instance ■ Global zone, zone cluster ■ Sockets Direct Protocol (SDP) support: ■ 10.3.5 and 10.3.6 are supported in Engineered Systems ■ 12.1.2 requires at least Oracle Solaris Cluster 4.1 SRU 7
PostgreSQL	9.0.x, 9.1.x, 9.2.x, 9.3.x	■ Failover ■ Failover zone, global zone, zone cluster ■ 9.x.x requires at least Oracle Solaris Cluster 4.1 SRU 3
Samba	3.6.6, and 3.6.12 as shipped with Oracle Solaris 11.1	■ Samba (smbc, nmbd): Failover ■ Winbind: Failover ■ Global zone, zone cluster ■ Requires at least Oracle Solaris Cluster 4.1 SRU 3
SAP liveCache	7.7, 7.9	■ Failover ■ Global zone, zone cluster ■ Requires at least Oracle Solaris Cluster 4.1 SRU 3

Application	Application Version	Comments for Oracle Solaris Cluster 4.1 on x64
SAP MaxDB	7.8, 7.9	■ Failover ■ Global zone, zone cluster ■ Requires at least Oracle Solaris Cluster 4.1 SRU 3
SAP NetWeaver	Versions that run on SAP kernels: ■ 720_EXT, minimum patch level 300 ■ 721_EXT, minimum patch level 130 ■ 722, minimum patch level 25 ■ 740, minimum patch level 36 ■ 741, minimum patch level 11 ■ 742, minimum patch level 28 ■ 745, minimum patch level 15	■ Failover, multiple master ■ Global zone, zone cluster ■ See SAP NetWeaver entry in Table 42, "Data Services for Oracle Solaris Cluster 4.1 on SPARC," on page 84
Sybase Adaptive Server Enterprise (ASE)	15.7	■ Failover ■ Global zone, zone cluster ■ Supported in HA mode only – both asymmetric and symmetric ■ The Companion Server feature is not supported ■ 15.7 requires at least Oracle Solaris Cluster 4.1 SRU 3

Oracle Database on Oracle Solaris Cluster 4.1

The following tables contain supplemental HA-Oracle information for Table 42, "Data Services for Oracle Solaris Cluster 4.1 on SPARC," on page 84 and Table 43, "Data Services for Oracle Solaris Cluster 4.1 on x64," on page 87:

■ Table 44, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 SPARC," on page 91

■ Table 45, "HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 x64," on page 91

■ Table 46, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 SPARC," on page 91

■ Table 47, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 x64," on page 92

TABLE 44   HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 SPARC

HA-Oracle 12c Release 1 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
UFS	Y	Y	Y	Y	Y
QFS	Y	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y	Y
PxFS	Y	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y	Y
Clustered ASM	Y	Y	Y	Y[b]	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle Database 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 45   HA-Oracle 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 x64

HA-Oracle 12c Release 1 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
UFS	Y	Y	Y	Y
QFS	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y
PxFS	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y[b]
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support
- b – Oracle Database 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 46   HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 SPARC

HA-Oracle 12c Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
UFS	Y	Y	Y	Y	Y
QFS	Y	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y	Y

HA-Oracle 12c Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
PxFS	Y	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y	Y
Clustered ASM	Y	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support

TABLE 47   HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 x64

HA-Oracle 12c Release 1 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
UFS	Y	Y	Y	Y
QFS	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y
PxFS	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support

Oracle RAC Oracle Solaris Cluster 4.1

Oracle Real Application Clusters (RAC) Enterprise Edition is supported with Oracle Solaris Cluster. Refer to the following tables for Oracle RAC support details. These tables contain supplemental information to Table 42, "Data Services for Oracle Solaris Cluster 4.1 on SPARC," on page 84 and Table 43, "Data Services for Oracle Solaris Cluster 4.1 on x64," on page 87:

- Table 48, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 SPARC," on page 93
- Table 49, "Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 x64," on page 93
- Table 50, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 SPARC," on page 93

- Table 51, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 x64," on page 94

TABLE 48   Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 SPARC

Oracle RAC 12c Release 1 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
Shared QFS	Y^b	Y^b	Y^b	Y^b	Y^b
NFS Appliance[a]	N/A	N/A	Y^b	Y^b	Y^b
Clustered ASM	Y	Y^b	Y	Y^b	Y
Solaris Volume Manager	Y^b	N/A	Y^b	Y^b	Y^b
HW RAID	N/A	N/A	Y^b	Y^b	Y^b

- a – Includes Direct NFS (dNFS) support
- b – Oracle RAC 12.1.0.1 only
- c – Oracle RAC 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 49   Oracle RAC 12c Release 1 Matrix for Oracle Solaris Cluster 4.1 x64

Oracle RAC 12c Release 1 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
Shared QFS	Y^b	Y^b	Y^b	Y^b
NFS Appliance[a]	N/A	N/A	Y^b	Y^b
Clustered ASM	Y	Y	Y	Y^c
Solaris Volume Manager	Y^b	N/A	Y^b	Y^b
HW RAID	N/A	N/A	Y^b	Y^b

- a – Includes Direct NFS (dNFS) support
- b – Oracle RAC 12.1.0.1 only
- c – Oracle RAC 12.1.0.2 Shared-IP Zone Cluster support starts with Grid Infrastructure Patch Set Update (PSU) 19392646

TABLE 50   Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 SPARC

Oracle RAC 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
Shared QFS	Y	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y	Y
Clustered ASM	Y	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y

Oracle RAC 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support

TABLE 51   Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.1 x64

Oracle RAC 11g Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
Shared QFS	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support

TABLE 52   Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.1 SPARC

Data Service	Application Version	Comments
Generic Data Service (GDS) based services	N/A	■ Failover, multiple master, scalable ■ A GDS-based data service can run in a `solaris10` branded Zone Cluster provided that the application is also configured to run in a `solaris10` branded zone
HA for Alliance Access	7.0	Failover
HA for Alliance Gateway	7.0	Failover
HA for Apache	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Proxy Server	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Tomcat	3.3 4.0, 4.1	Failover, multiple master, scalable

Data Service	Application Version	Comments
	5.0, 5.5, 5.5.x 6.0 7.0.x	
HA for Business Intelligence Enterprise Edition	10.1.3.x (for x >= 0)	Failover, multiple master (integrated with OBIEE built-in clustering)
HA for Domain Name Service (DNS)	Version shipped with Oracle Solaris	Failover
HA for Informix	V9.4 10 11, 11.5	Failover
HA for MySQL	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6	Failover, multiple master, scalable
HA for MySQL Cluster	7.0.x (for x >= 7) 7.1.x (for x >= 0) 7.2.x (for x >= 0)	Failover

HA for Oracle	10g Release 2:
	
	■ 10.2.0.4, 10.2.0.5
		■ Failover
		■ Zone Cluster requirements:
		  ■ Oracle Solaris Cluster 3.3 5/11 + patch
		  ■ Oracle Solaris Cluster 3.3 3/13
		■ Global Zone requirements:
		  ■ Oracle Solaris 11.2
		  ■ Oracle Solaris 11.3

HA for Oracle Application Server	10.1.2, 10.1.3.1	Failover
HA for Oracle External Proxy	N/A	■ Failover, multiple master ■ Proxies a remote Oracle DB/RAC to reflect the DB state/status as a RGM resource state/status ■ Remote Oracle DB/RAC must be on Oracle Solaris (SPARC or x86) ■ Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC)
HA for Oracle Web Tier	11.1.1.x	Failover
HA for Oracle WebLogic Server	10.3, 10.3.3, 10.3.4, 10.3.5, 10.3.6	■ Failover, multiple master (clustered WLS) ■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11

Data Service	Application Version	Comments
HA for PeopleSoft Application Server	PeopleTools 8.50, 8.51, 8.52	■ Failover ■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11
HA for PeopleSoft Process Scheduler	PeopleTools 8.50, 8.51, 8.52	Failover
HA for PostgreSQL	7.3.x 8.0.x, 8.1.x, 8.2.x, 8.3.x, 8.4.x 9.0.x, 9.1.x, 9.2.x	Failover
HA for Samba	2.2.2 - 3.5.5	■ Failover ■ "Clustered" Samba is not supported
HA for SAP liveCache	7.4, 7.5, 7.6, 7.7	■ Failover ■ 7.6 needs at least 7.6.03.09 ■ 7.7 needs at least 7.7.07.14 (with SCM 7.0) ■ 7.7.04.38 and later supported with SCM 5.1 **Note -** SAP note 1461682 specifies corrective steps to make at install time.
HA for SAP MaxDB	7.4, 7.5, 7.6, 7.7, 7.8	■ Failover ■ 7.6 needs at least MaxDB 7.6.03.09 for S10 SPARC ■ 7.8 support requires at least patch 147091-05

HA for SAP NetWeaver	Versions that run on SAP kernels:
	
	■ 720 or 720_EXT, minimum patch level 300
	■ 721 or 721_EXT, minimum patch level 130
	■ 740, minimum patch level 36
	■ 741, minimum patch level 11
	■ 742, minimum patch level 28
		■ Failover, multiple master
		■ SAP certified. For information, see:
		  ■ `https://www.sap.com/index.html` – Click on Our Partners and then Find an SAP Partner. Expand Partner Information Center (PIC) and click on Partner Information Center. Select the Search for Solutions tab and search for "Solaris Cluster" as the Solution Name. Click on Solaris Cluster 3.3.
		  ■ SAP Note 1740305 – Central Note: HA SAP systems on Solaris Cluster 3.3
		■ Supports all SAP versions based on the listed kernels, e.g., SAP NetWeaver 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3. 7.1, 7.1 EHP1, 7.3, 7.3 EHP1, 7.4, and all products based on those, e.g.,
		■ SAP Customer Relationship Management 6.0 (CRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
		■ SAP Enterprise Resource Planning 6.0, 6.0 EHP1, 6.0 HEP2, 6.0 EHP3, 6.0 EHP4, 6.0 EHP5, 6.0 EHP6, 6.0 EHP7
		■ SAP NetWeaver Composition Environment 7.1, 7.1 EHP1, 7.2
		■ SAP NetWeaver J2EE (Advanced) Adapter Engine 7.0, 7.0 EPH1, 7.0 EPH2, 7.3, 7.3 EPH1, 7.4
		■ SAP NetWeaver Mobile Infrastructure 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3 EHP1, 7.4
		■ SAP NetWeaver Partner Connectivity Kit 7.0, 7.0 EPH1, 7.0 EPH2, 7.3

Data Service	Application Version	Comments
		■ SAP NetWeaver Process Integration 7.0, 7.0 EPH1, 7.0 EPH2, 7.1, 7.1 EHP1, 7.3, 7.3 EPH1, 7.4
		■ SAP NetWeaver Process Orchestration 7.3 EPH1, 7.4
		■ SAP Solution Manager 7.0 EHP1, 7.1
		■ SAP Supplier Relationship Management 5.0, 6.0 (SRM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
		■ SAP Supply Chain Management 5.1 (SCM 2007), 7.0, 7.0 EHP1, 7.0 EHP2, 7.0 EHP3
HA for Siebel	8.0, 8.1.1, 8.2.2	Failover
HA for Sun GlassFish Message Queue, formerly HA for Sun Java System Message Queue and HA for Sun One Message Queue	4.4, 4.4u1, 4.5	Failover
HA for Sun Java System Application Server	All versions until JES 5 U1, 9.1, 9.1 UR2, GlassFish V2 UR2	Failover
HA for Sun Java System Web Proxy Server	Up to and including 4.0	Failover
HA for Sun Java System Web Server	All versions up to and including JES 5 U1 are supported. All releases up to and including 7.0, 7.0 U1, 7.0 U2 and all future updates of 7.0 release.	Failover, scalable
HA for Sybase Adaptive Server Enterprise (ASE)	15.0, 15.0.1, 15.0.2, 15.0.3 15.7.0	■ Failover ■ Supported in HA mode only – both asymmetric and symmetric ■ The Companion Server feature is not supported ■ Application version 15.7.0 is supported on UFS and ZFS

HA for TimesTen	11.2.1.x (for x >= 4)
	
	11.2.2.x
		■ Failover, scalable
		■ Supported configurations:
		  ■ failover master
		  ■ scalable / multi master
		  ■ active-active
		■ Not supported: active-standby

HA for WebSphere Message Broker	5.0 6.0 7.0	Failover

Data Service	Application Version	Comments
HA for WebSphere MQ	5.3 6.0 7.0	Failover

Oracle Real Application Clusters (RAC) Enterprise Edition	10g Release 2:
	
	■ 10.2.0.5
	
	11g Release 1:
	
	■ 11.1.0.7
	
	11g Release 2:
	
	■ 11.2.0.3
	■ 11.2.0.4
		■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11
		■ 10.2.0.5, 11.1.0.7:
		  ■ Zone Cluster requirements:
		    ■ Oracle Solaris Cluster 3.3 5/11, or Oracle Solaris Cluster 3.3 3/13, with at least patches 145333-23 and 145335-17
		    ■ At least Oracle Solaris 10 1/13
		  ■ Global Zone requirements:
		    ■ Oracle Solaris 11.1 starting with SRU 8, or Oracle Solaris 11.2
		■ 11.2.0.3, 11.2.0.4:
		  ■ Zone Cluster requirements:
		    ■ No UDLM
		    ■ No SVM
		    ■ Oracle Solaris Cluster 3.3 5/11 + patches, or Oracle Solaris Cluster 3.3 3/13
		  ■ Global Zone requirements:
		    ■ Oracle Solaris 11.1, or Oracle Solaris 11.2 starting with SRU 1

TABLE 53   Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.1 x64

Data Service	Application Version	Comments
Generic Data Service (GDS) based services	N/A	■ Failover, multiple master, scalable ■ A GDS-based data service can run in a `solaris10` branded Zone Cluster provided that the application is also configured to run in a `solaris10` branded zone
HA for Apache	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Proxy Server	2.2.x	■ Failover, scalable ■ 2.2.x and all versions of Apache shipped with Oracle Solaris 10, and the same versions from the Apache web site

Data Service	Application Version	Comments
		Note - For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
HA for Apache Tomcat	3.3 4.0, 4.1 5.0, 5.5, 5.5.x 6.0 7.0.x	Failover, multiple master, scalable
HA for Domain Name Service (DNS)	Version shipped with Oracle Solaris	Failover
HA for Informix	V9.4 10 11, 11.5	Failover
HA for MySQL	3.23.54a - 4.0.23 4.1.6 - 4.1.22 5.0.15 - 5.0.85, 5.1.x, 5.5, 5.6	Failover, multiple master, scalable
HA for MySQL Cluster	7.0.x (for x >= 7) 7.1.x (for x >= 0) 7.2.x (for x >= 0)	Failover

HA for Oracle	10g Release 2:
	
	■ 10.2.0.4, 10.2.0.5
		■ Failover
		■ 10g Release 2 zone cluster requirements:
		  ■ Oracle Solaris Cluster 3.3 5/11 + patch or Oracle Solaris Cluster 3.3 3/13
		■ 10g Release 2 global zone requirements:
		  ■ Oracle Solaris 11.1 or Oracle Solaris 11.2

HA for Oracle Application Server	10.1.2, 10.1.3.1	Failover
HA for Oracle External Proxy	N/A	■ Failover, multiple master ■ Proxies a remote Oracle DB/RAC to reflect the DB state/status as a RGM resource state/status ■ Remote Oracle DB/RAC must be on Oracle Solaris (SPARC or x86) ■ Interrogates remote 10gR2, 11gR1, 11gR2, 12cR1, and 12cR2 Oracle databases (single instance or RAC)
HA for Oracle Web Tier	11.1.1.x	Failover
HA for Oracle WebLogic Server	10.3, 10.3.3, 10.3.4, 10.3.5, 10.3.6	■ Failover, multiple master (clustered WLS)

Data Service	Application Version	Comments
		■ Also supported in `solaris10` branded Zone Clusters running Oracle Solaris Cluster 3.3 5/11
HA for PostgreSQL	7.3.x 8.0.x, 8.1.x, 8.2.x, 8.3.x, 8.4.x 9.0.x, 9.1.x, 9.2.x	Failover
HA for Samba	2.2.2 - 3.5.5	■ Failover ■ "Clustered" Samba is not supported
HA for SAP liveCache	7.6, 7.7	■ Failover ■ 7.6 needs at least 7.6.01.09 ■ 7.7 needs at least 7.7.07.14 (with SCM 7.0) ■ 7.7.04.38 and later supported with SCM 5.1 **Note -** SAP note 1461682 specifies corrective steps to make at install time.
HA for SAP MaxDB	7.6, 7.7, 7.8	■ Failover ■ 7.6 needs at least 7.6.01.09 ■ 7.8 support requires at least patch 147092-05
HA for SAP NetWeaver	Versions that run on SAP kernels: ■ 720 or 720_EXT, minimum patch level 300 ■ 721 or 721_EXT, minimum patch level 130 ■ 740, minimum patch level 36 ■ 741, minimum patch level 11 ■ 742, minimum patch level 28	■ Failover, multiple master ■ See SAP NetWeaver entry in Table 40, "Oracle Solaris Cluster 3.3 3/13 Data Services Supported in `solaris10` Branded Zone Clusters for Oracle Solaris Cluster 4.2 SPARC," on page 73
HA for Sun GlassFish Message Queue, formerly HA for Sun Java System Message Queue and HA for Sun One Message Queue	4.4, 4.4.u1	Failover
HA for Sun Java System Application Server	All versions until JES 5 U1, 9.1, 9.1 UR2, GlassFish V2 UR2	Failover

Data Service	Application Version	Comments
HA for Sun Java System Web Proxy Server	Up to and including 4.0	Failover
HA for Sun Java System Web Server	All versions up to and including JES 5 U1 are supported. All releases up to and including 7.0, 7.0 U1, 7.0 U2 and all future updates of 7.0 release.	Failover, scalable
HA for Sybase Adaptive Server Enterprise (ASE)	15.0, 15.0.1, 15.0.2, 15.0.3	Failover

HA for TimesTen	11.2.1.x (for x >= 4)
	
	11.2.2.x
		■ Failover, scalable
		■ Supported configurations:
		  ■ failover master
		  ■ scalable / multi master
		  ■ active-active
		■ Not supported: active-standby

HA for WebSphere Message Broker	6.0 7.0	Failover
HA for WebSphere MQ	6.0 7.0	Failover

Oracle Real Application Clusters (RAC) Enterprise Edition	10g Release 2:
	
	■ 10.2.0.5
	
	11g Release 2:
	
	■ 11.2.0.3
	■ 11.2.0.4
		■ 10.2.0.5:
		  ■ Zone Cluster requirements:
		    ■ Oracle Solaris Cluster 3.3 5/11 + patches or Oracle Solaris Cluster 3.3 3/13
		  ■ Global Zone requirements:
		    ■ Oracle Solaris 11.1
		■ 11.2.0.3, 11.2.0.4:
		  ■ Zone Cluster requirements:
		    ■ No UDLM
		    ■ No SVM
		    ■ Oracle Solaris Cluster 3.3 5/11 + patches or Oracle Solaris Cluster 3.3 3/13
		  ■ Global Zone requirements:
		    ■ Oracle Solaris 11.2 starting with SRU 1 or Oracle Solaris 11.3

6

Data Service Support for Oracle Solaris Cluster 4.0

This chapter covers data service support for Oracle Solaris Cluster 4.0.

Application Services on Oracle Solaris Cluster 4.0

An application service is an application along with an data service which makes the application highly available or scalable in Oracle Solaris Cluster.

All Oracle Solaris Cluster 4.0 data services are supported in the global zone. Many data services are supported with the Oracle Solaris HA-container data service failover zone and Zone Cluster as noted in the following tables:

- Table 54, "Data Services for Oracle Solaris Cluster 4.0 on SPARC," on page 103
- Table 55, "Data Services for Oracle Solaris Cluster 4.0 on x64," on page 105

All Oracle Solaris Cluster 4.0 data services are supported with IPv4 only.

TABLE 54   Data Services for Oracle Solaris Cluster 4.0 on SPARC

Application	Application Version	Comments for Oracle Solaris Cluster 4.0 on SPARC
Apache Tomcat	6.0: starting with 6.0.28 7.0: starting with 7.0.06	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster
Apache Web Server	2.2.x 2.4.x	■ Failover, scalable ■ Global zone, zone cluster ■ Both non-SSL-aware Apache and SSL-aware Apache are supported. Notes for configuring SSL-aware Apache with this data service is in Oracle Bug 20525331 available in MOS. ■ 2.2.x shipped with Oracle Solaris 11.1, Oracle Solaris 11.2 or Oracle Solaris 11.3, and the same versions from the Apache web site

Application	Application Version	Comments for Oracle Solaris Cluster 4.0 on SPARC
		■ 2.4.x versions from the Apache web site
Domain Name Service (DNS)	N/A	■ Failover ■ Global zone, zone cluster
Dynamic Host Configuration Protocol (DHCP)	N/A	■ Failover ■ Global zone
Generic Data Service (GDS) (SUNW.gds)	N/A	■ Failover, multiple master, scalable ■ Global zone, zone cluster
NFS	V3 V4	■ Failover ■ Global zone
Oracle Database (HA-Oracle)	11g Release 2: ■ 11.2.0.3	■ Failover ■ Global zone, zone cluster ■ Details in Table 56, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 SPARC," on page 106 for details
Oracle E-Business Suite	12.1	■ Failover, multiple master (Parallel Concurrent Processing), scalable ■ Global zone, zone cluster ■ Starts with Oracle Solaris Cluster 4.0 SRU 2
Oracle GlassFish Server Message Queue	4.5.2	■ Failover ■ Global zone, zone cluster
Oracle Real Application Clusters (RAC) Enterprise Edition	11g Release 2: ■ 11.2.0.3	■ Global zone, zone cluster ■ Details in Table 58, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 SPARC," on page 108
Oracle Solaris Zones	Brand types: `solaris` and `solaris10` branded containers	■ Failover, multiple master ■ Global zone
Oracle VM Server for SPARC	2.1, 2.2	■ Failover ■ Global zone
Oracle Web Tier	11.1.1.4, 11.1.1.5	■ Failover ■ Global zone, zone cluster
Oracle WebLogic Server	10.3.3, 10.3.4, 10.3.5	■ Failover ■ Global zone, zone cluster
SAP NetWeaver	Versions that run on SAP kernels 7.20, 7.20_EXT	■ Failover, multiple master ■ Global zone, zone cluster ■ Starts with Oracle Solaris Cluster 4.0 SRU 4 ■ Minimum patch level 300 for 7.20, 7.20_EXT ■ SAP certified. For information, see: ■ `https://www.sap.com/index.html` – Click on Our Partners and then Find an SAP Partner. Expand Partner Information

Application	Application Version	Comments for Oracle Solaris Cluster 4.0 on SPARC
		Center (PIC) and click on Partner Information Center. Select the Search for Solutions tab and search for "Solaris Cluster" as the Solution Name. Click on Solaris Cluster 3.3. ■ SAP Note 1740958 – Central Note: SAP on Solaris Cluster 4.x and Solaris 11

TABLE 55   Data Services for Oracle Solaris Cluster 4.0 on x64

Application	Application Version	Comments for Oracle Solaris Cluster 4.0 on x64
Apache Tomcat	6.0: starting with 6.0.28 7.0: starting with 7.0.06	■ Failover, multiple master, scalable ■ For failover: failover zone, global zone, zone cluster ■ For multiple master, scalable: global zone, zone cluster
Apache Web Server	2.2.x	■ Failover, scalable ■ Global zone, zone cluster ■ 2.2.x shipped with Oracle Solaris 11.1, Oracle Solaris 11.2 or Oracle Solaris 11.3, and the same versions from the Apache web site **Note -** For Apache versions 2.2.x, the data service supports only standard HTTP server. Apache-SSL and mod_ssl are not supported.
Domain Name Service (DNS)	N/A	■ Failover ■ Global zone, zone cluster
Dynamic Host Configuration Protocol (DHCP)	N/A	■ Failover ■ Global zone
Generic Data Service (GDS) (SUNW.gds)	N/A	■ Failover, multiple master, scalable ■ Global zone, zone cluster
NFS	V3 V4	■ Failover ■ Global zone
Oracle Database (HA-Oracle)	11g Release 2: ■ 11.2.0.3	■ Failover ■ Global zone, zone cluster ■ Details in Table 57, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 x64," on page 107
Oracle GlassFish Server Message Queue	4.5.2	■ Failover ■ Global zone, zone cluster ■ Starts with Oracle Solaris Cluster 4.0 SRU 4
Oracle Real Application Clusters (RAC) Enterprise Edition	11g Release 2: ■ 11.2.0.3	■ Global zone, zone cluster ■ Details in Table 59, "Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 x64," on page 108
Oracle Solaris Zones	`solaris` and `solaris10` branded containers	■ Failover, multiple master ■ Global zone

Application	Application Version	Comments for Oracle Solaris Cluster 4.0 on x64
Oracle Web Tier	11.1.1.4, 11.1.1.5	■ Failover ■ Global zone, zone cluster
Oracle WebLogic Server	10.3.3, 10.3.4, 10.3.5	■ Failover, multiple master ■ Global zone

SAP NetWeaver	Versions that run on SAP kernels 7.20, 7.20_EXT	■ Failover, multiple master
		■ Global zone, zone cluster
		■ Starts with Oracle Solaris Cluster 4.0 SRU 4
		■ Minimum patch level 300 for 7.20, 7.20_EXT
		■ SAP certified. For information, see:
		
		   ■ `https://www.sap.com/index.html` – Click on Our Partners and then Find an SAP Partner. Expand Partner Information Center (PIC) and click on Partner Information Center. Select the Search for Solutions tab and search for "Solaris Cluster" as the Solution Name. Click on Solaris Cluster 3.3.
		   ■ SAP Note 1740958 -Central Note: SAP on Solaris Cluster 4.x and Solaris 11

Sybase Adaptive Server Enterprise (ASE)	15.7	■ Failover ■ Global zone, zone cluster ■ Supported in HA mode only – both asymmetric and symmetric ■ The Companion Server feature is not supported

Oracle Database on Oracle Solaris Cluster 4.0

The following tables contain supplemental information to Table 54, "Data Services for Oracle Solaris Cluster 4.0 on SPARC," on page 103 and Table 55, "Data Services for Oracle Solaris Cluster 4.0 on x64," on page 105:

- Table 56, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 SPARC," on page 106
- Table 57, "HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 x64," on page 107

TABLE 56   HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 SPARC

HA-Oracle 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
UFS	Y	Y	Y	Y	Y
QFS	Y	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y	Y
PxFS	Y	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y	Y

HA-Oracle 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
ACFS	Y	N/A	Y	Y[b]	Y
Clustered ASM	Y	Y	Y	Y[b]	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support

TABLE 57   HA-Oracle 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 x64

HA-Oracle 11g Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
UFS	Y	Y	Y	Y
QFS	Y	Y	Y	Y
ZFS	Y	N/A	Y	Y
PxFS	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support

Oracle RAC on Oracle Solaris Cluster 4.0

Oracle Real Application Clusters (RAC) Enterprise Edition is supported with Oracle Solaris Cluster. Refer to the following tables for Oracle RAC support details. The following tables contain supplemental information to Table 54, "Data Services for Oracle Solaris Cluster 4.0 on SPARC," on page 103 and Table 55, "Data Services for Oracle Solaris Cluster 4.0 on x64," on page 105:

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TABLE 58   Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 SPARC

Oracle RAC 11g Release 2 on SPARC	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster	Oracle VM Server for SPARC
Shared QFS	Y	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y	Y
Clustered ASM	Y	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y	Y
HW RAID	N/A	N/A	Y	Y	Y

- a – Includes Direct NFS (dNFS) support

TABLE 59   Oracle RAC 11g Release 2 Matrix for Oracle Solaris Cluster 4.0 x64

Oracle RAC 11g Release 2 on x64	HW RAID	Solaris Volume Manager	Global Zone	Zone Cluster
Shared QFS	Y	Y	Y	Y
NFS Appliance[a]	N/A	N/A	Y	Y
Clustered ASM	Y	Y	Y	Y
Solaris Volume Manager	Y	N/A	Y	Y
HW RAID	N/A	N/A	Y	Y

- a – Includes Direct NFS (dNFS) support

♦ ♦ ♦   **C H A P T E R   7**

7

Campus Clusters in Oracle Solaris Cluster

Campus clusters are a common means of achieving disaster recovery. Unlike traditional clusters, the nodes of a campus cluster can be several kilometers apart. This enables application services to be highly available in the event of a fire, earthquake, area power outage, etc.

For a description of campus cluster concepts and configurations, refer to the *Oracle Solaris Cluster Hardware Administration Manual*. In general, the support information for traditional clusters in the rest of this guide applies to campus cluster configurations as well.

Cluster Shared Storage

Oracle storage products supported for cluster shared storage in campus cluster configurations are noted in Chapter 11, "Fibre Channel Storage Support on Oracle Solaris Cluster". Each storage product discussion contains a Campus Cluster subsection noting campus cluster support.

Storage-Based Data Replication

EMC Symmetrix Remote Data Facility

EMC Symmetrix Remote Data Facility (SRDF) may be used for replicating data in Oracle Solaris Cluster campus cluster environments.

Support Information for Campus Clusters

SRDF for data replication is supported in global zones, and requires the following:

- Oracle Solaris Cluster releases: 4.0, 4.1, 4.2, 4.3 (includes SRUs)

- Enginuity firmware version 5671 or later
- EMC Solutions Enabler (SYMCLI) versions:
    - 7.2.x, 7.3.x, 7.4.x, 7.5.x, 7.6.x
    - 8.0.x, 8.1.x
- Storage:
    - EMC Symmetrix DMX
    - EMC VMAX

    See the Oracle Solaris Cluster Storage Partner Program page for additional information.
- Not supported:
    - Solaris Volume Manager for Sun Cluster multi-owner disk sets
    - Shared QFS
    - EMC SRDF consistency groups

8

Oracle Solaris Cluster Geographic Edition

This chapter discusses the Oracle Solaris Cluster Geographic Edition.

General Configuration of the Oracle Solaris Cluster Geographic Edition

Elements of the Oracle Solaris Cluster Geographic Edition product configuration are:

- Oracle Solaris Cluster installation, with attached data storage. Oracle Solaris Cluster Geographic Edition places no additional restrictions on supported cluster configurations beyond those already imposed by the base Oracle Solaris Cluster configuration guidelines.

   Note - Data Replication products may have restrictions on data service support.

- Internet connections for inter-cluster management communication and default heartbeat between the Oracle Solaris Cluster installations.
- Connections for data replication.
- Optional connections for custom heartbeats, if required.
- Requires at least Java 1.6.

Application-Based Data Replication

Oracle Data Guard

Oracle Data Guard may be used for replicating data in Oracle Solaris Cluster Geographic Edition environments.

Support Information for Oracle Data Guard

Oracle Solaris Cluster Geographic Edition supports Oracle Data Guard data replication features present in 11g. 12c also supports the data replication features present in 11g.

Support of remote nodes (Oracle Data Guard instances running on systems not under Oracle Solaris Cluster control) starts with Oracle Solaris Cluster 4.2 SRU 1.

Remote node support:

- Oracle Database or Oracle Real Applications Clusters:
    - 11g Release 2
    - 12c Release 1, 12c Release 2
- Platforms:
    - Oracle Solaris SPARC or x64
    - Oracle Linux – running on:
        - Oracle servers
        - Oracle Exadata
        - Oracle Database Appliance

Far Sync, a new capability with Oracle Data Guard 12c, is supported starting with Oracle Solaris Cluster 4.3 SRU 4. Far Sync requires Oracle Database Enterprise Edition (Database and RAC) 12c as supported by Oracle Solaris Cluster 4.3. See Chapter 4, "Data Service Support for Oracle Solaris Cluster 4.2".

Global Zones

Oracle Data Guard for data replication is supported in global zones, and requires the following:

- Oracle Solaris Cluster 4.0 or later
- Oracle Data Guard is included with Oracle Database Enterprise Edition. For supported Oracle Database and Oracle Real Application Clusters versions, refer to the following chapters:
    - Chapter 3, "Data Service Support for Oracle Solaris Cluster 4.3"
    - Chapter 4, "Data Service Support for Oracle Solaris Cluster 4.2"
    - Chapter 5, "Data Service Support for Oracle Solaris Cluster 4.1"
    - Chapter 6, "Data Service Support for Oracle Solaris Cluster 4.0"

Zone Clusters and Oracle Data Guard

Oracle Data Guard for data replication is supported in zone clusters, and requires the following:

- Oracle Solaris Cluster 4.1 or later for exclusive-IP zones
- Oracle Solaris Cluster 4.0 or later for shared-IP zones
- Data Guard is included with Oracle Database Enterprise Edition. For supported Oracle Database and Oracle Real Application Clusters versions, refer to the following chapters:
  - Chapter 3, "Data Service Support for Oracle Solaris Cluster 4.3"
  - Chapter 4, "Data Service Support for Oracle Solaris Cluster 4.2"
  - Chapter 5, "Data Service Support for Oracle Solaris Cluster 4.1"
  - Chapter 6, "Data Service Support for Oracle Solaris Cluster 4.0"

`solaris10` Branded Zone Clusters and Oracle Data Guard

Oracle Data Guard for data replication is supported in `solaris10` branded exclusive-IP and shared-IP zone clusters, and requires the following:

- Global zone:
  - Oracle Solaris Cluster 4.1 and SRUs
  - Oracle Solaris Cluster 4.2 and SRUs
  - Oracle Solaris Cluster 4.3 and SRUs
- Zone cluster:
  - Oracle Solaris Cluster Geographic Edition 3.3 3/13
  - Oracle Solaris Cluster Geographic Edition 3.3 5/11
    - If the global zone is Oracle Solaris Cluster 4.1, requires at least Oracle Solaris Cluster 4.1 SRU 2
  - If the global zone is Oracle Solaris Cluster 4.2 or later, the `solaris10` branded zone cluster requires patch 145333-29 or later for SPARC, patch 145334-29 or later for x86
- Oracle Data Guard is included with Oracle Database Enterprise Edition. For supported Oracle Database and Oracle Real Application Clusters versions, refer to the following chapters:
  - Chapter 3, "Data Service Support for Oracle Solaris Cluster 4.3"
  - Chapter 4, "Data Service Support for Oracle Solaris Cluster 4.2"
  - Chapter 5, "Data Service Support for Oracle Solaris Cluster 4.1"
  - Chapter 6, "Data Service Support for Oracle Solaris Cluster 4.0"

Oracle GoldenGate

Oracle GoldenGate may be used for replicating data in Oracle Solaris Cluster Geographic Edition environments.

Support Information

Global Zones

Oracle GoldenGate is supported in global zones, and requires the following:

- Starting with Oracle Solaris Cluster 4.3
- For Oracle Golden Gate versions, see Chapter 3, "Data Service Support for Oracle Solaris Cluster 4.3"

Zone Clusters

Oracle GoldenGate is supported in zone clusters (exclusive IP and shared IP), and requires the following:

- Starting with Oracle Solaris Cluster 4.3
- For Oracle Golden Gate versions, see Chapter 3, "Data Service Support for Oracle Solaris Cluster 4.3"

`solaris10` Branded Zone Clusters and Oracle GoldenGate

Oracle GoldenGate is not supported in `solaris10` branded zone clusters.

MySQL for Data Replication

MySQL (MySQL Community Edition, MySQL Standard Edition, and MySQL Enterprise Edition) may be used for replicating data in Oracle Solaris Cluster Geographic Edition environments.

Support Information for MYSQL

Global Zones and MySQL

MySQL for data replication is supported in global zones, and requires the following:

- Starting with Oracle Solaris Cluster 4.0
- MySQL versions thru 5.7 – refer to the following chapters:
  - Chapter 3, "Data Service Support for Oracle Solaris Cluster 4.3"

- Chapter 4, "Data Service Support for Oracle Solaris Cluster 4.2"
- Chapter 5, "Data Service Support for Oracle Solaris Cluster 4.1"
- Chapter 6, "Data Service Support for Oracle Solaris Cluster 4.0"

Zone Clusters and MySQL

MySQL for data replication is supported in zone clusters, and requires the following:

- Starting with Oracle Solaris Cluster 4.1 for exclusive-IP zones
- Starting with Oracle Solaris Cluster 4.0 for shared-IP zones
- MySQL versions thru 5.7 and 7.5.x - refer to the following chapters:
    - Chapter 3, "Data Service Support for Oracle Solaris Cluster 4.3"
    - Chapter 4, "Data Service Support for Oracle Solaris Cluster 4.2"
    - Chapter 5, "Data Service Support for Oracle Solaris Cluster 4.1"
    - Chapter 6, "Data Service Support for Oracle Solaris Cluster 4.0"

`solaris10` Branded Zone Clusters and MySQL

MySQL for data replication is not supported in `solaris10` branded zone clusters.

Host-Based Data Replication

Availability Suite

Availability Suite may be used for replicating data in Oracle Solaris Cluster Geographic Edition environments.

Global Zones and Availability Suite

Availability Suite for data replication is supported in global zones, and requires the following:

- Starting with Oracle Solaris Cluster 4.0
- Starting with Oracle Solaris 11 SRU 1 – Availability Suite is bundled with Oracle Solaris 11 releases
- Not supported with ZFS

Zone Clusters and Availability Suite

Availability Suite for data replication is not supported in zone clusters.

`solaris10` Branded Zone Clusters and Availability Suite

MySQL for data replication is not supported in `solaris10` branded zone clusters.

Oracle Solaris ZFS Snapshot

ZFS snapshot features may be used for replicating data in Oracle Solaris Cluster Geographic Edition environments.

Global Zones and ZFS Snapshot Data Replication

ZFS snapshot data replication is supported in global zones, starting with Oracle Solaris Cluster 4.3.

Zone Clusters and ZFS Snapshot Data Replication

ZFS snapshot data replication is supported in zone clusters (exclusive IP and shared IP), starting with Oracle Solaris Cluster 4.3.

`solaris10` Branded Zone Clusters

ZFS snapshot data replication is not supported in `solaris10` branded zone clusters.

Storage-Based Data Replication

Oracle ZFS Storage Appliance Remote Replication

Oracle ZFS Storage Appliance (ZFS SA) Remote Replication may be used for replicating data in Oracle Solaris Cluster Geographic Edition environments.

Global Zones and ZFS SA Remote Replication

ZFS SA Remote Replication for data replication is supported in global zones, and requires the following:

- Starting with Oracle Solaris Cluster 4.1
- Oracle ZFS Storage Software
    - 2013.1.7.x – Oracle Solaris Cluster 4.3 SRU 8 and later SRUs
    - 2013.1.6.x – Oracle Solaris Cluster 4.3 SRU 3 and later SRUs
    - 2013.1.5.x – Oracle Solaris Cluster 4.3 SRU 3 and later SRUs
    - 2013.1.4.x:
        - Oracle Solaris Cluster 4.3 and SRUs
        - Oracle Solaris Cluster 4.2 and SRUs
    - 2013.1.3.x – Oracle Solaris Cluster 4.2 and SRUs
    - 2011.1.6.x, 2011.1.7.x, 2011.1.8.x, 2011.1.9.x, 2013.1.1.x, 2013.1.2.x:
        - Oracle Solaris Cluster 4.2 and SRUs
        - Oracle Solaris Cluster 4.1 SRU 7 and later SRUs
    - 2011.1.5.x – Oracle Solaris Cluster 4.1 and SRUs earlier than SRU 7
- Not supported:
    - Solaris Volume Manager for Sun Cluster multi-owner disk sets
    - Shared QFS
- Storage: Oracle ZFS Storage Appliances
    - For Fibre Channel, see "Oracle FS1-2 Flash Storage System for FC Storage" on page 131
    - For Ethernet, see "Oracle ZFS Storage Appliance on Ethernet Requirements" on page 139

Zone Clusters and ZFS SA Remote Replication

ZFS SA Remote Replication for data replication is supported in shared-IP and exclusive-IP zone clusters, and requires the following:

- Starting with Oracle Solaris Cluster 4.1
- Oracle ZFS Storage Software
    - 2013.1.7.x – Oracle Solaris Cluster 4.3 SRU 8 and later SRUs
    - 2013.1.6.x – Oracle Solaris Cluster 4.3 SRU 3 and later SRUs
    - 2013.1.5.x – Oracle Solaris Cluster 4.3 SRU 3 and later SRUs

- 2013.1.4.x:
    - Oracle Solaris Cluster 4.3 and SRUs
    - Oracle Solaris Cluster 4.2 and SRUs
- 2013.1.3.x – Oracle Solaris Cluster 4.2 and SRUs
- 2011.1.6.x, 2011.1.7.x, 2011.1.8.x, 2011.1.9.x, 2013.1.1.x, 2013.1.2.x:
    - Oracle Solaris Cluster 4.2 and SRUs
    - Oracle Solaris Cluster 4.1 SRU 7 and later SRUs
- 2011.1.5.x – Oracle Solaris Cluster 4.1 and SRUs earlier than SRU 7
- Not supported:
    - Solaris Volume Manager for Sun Cluster multi-owner disk sets
    - Shared QFS
- Oracle ZFS Storage Appliances Support, see:
    - "Oracle ZFS Storage Appliance on Fibre Channel" on page 132
    - "Oracle ZFS Storage Appliance on Ethernet Requirements" on page 139

`solaris10` Branded Zone Clusters and ZFS SA Remote Replication

ZFS SA Remote Replication for data replication is supported in `solaris10` branded exclusive-IP and shared-IP zone clusters, and requires the following:

- Global zone – Oracle Solaris Cluster 4.3 and SRUs
- Zone cluster:
    - Oracle Solaris Cluster Geographic Edition 3.3 3/13
    - The `solaris10` branded zone cluster requires patch 145333-29 or later for SPARC, patch 145334-29 or later for x86
    - For support of AK 2013.1.7.x, install patch 152877-01 or later for SPARC, patch 152878-01 or later for x64
    - For support of AK 2013.1.7.x, install v1.0.5 of package `SUNWsczfsnfs` and v1.0.10 of package `ORCLscgezfssacli`. Download the packages from `http://www.oracle.com/technetwork/server-storage/sun-unified-storage/downloads/zfssa-plugins-1489830.html`.

Note - Oracle ZFS Storage Appliance AK 2013.1.5.x is not supported with `solaris10` branded zone clusters.

EMC Symmetrix Remote Data Facility

EMC Symmetrix Remote Data Facility (SRDF) may be used for replicating data in Oracle Solaris Cluster Geographic Edition environments.

See the Solutions Enabler Client/Server Configuration Example appendix – `http://docs.oracle.com/cd/E56676_01/html/E58402/gqnwl.html#scrolltoc` - in the Oracle Solaris Cluster Geographic Edition Data Replication Guide for EMC Symmetrix Remote Data Facility for an example configuration.

Global Zones and EMC SRDF

SRDF for data replication is supported in global zones, and requires the following:

- Oracle Solaris Cluster releases: 4.0, 4.1, 4.2, 4.3 and SRUs
- Enginuity firmware version 5671 or later
- EMC Solutions Enabler (SYMCLI) versions:
    - 7.2.x, 7.3.x, 7.4.x, 7.5.x, 7.6.x
    - 8.0.x, 8.1.x
- Storage:
    - EMC Symmetrix DMX
    - EMC VMAX

        See the Oracle Solaris Cluster Storage Partner Program page for additional information.
- Not supported:
    - Solaris Volume Manager
    - Shared QFS
    - SRDF consistency groups

Zone Clusters and EMC SRDF

SRDF for data replication is supported in shared-IP and exclusive-IP zone clusters using Solutions Enabler client/server configurations and requires the following:

- Oracle Solaris Cluster releases: 4.3 SRU 3 and later SRUs
- Enginuity firmware version 5671 or later
- EMC Solutions Enabler (SYMCLI) versions:
    - 7.2.x, 7.3.x, 7.4.x, 7.5.x, 7.6.x

- 8.0.x, 8.1.x
- Storage:
  - EMC Symmetrix DMX
  - EMC VMAX

  See the Oracle Solaris Cluster Storage Partner Program page for additional information.
- Not supported:
  - Solaris Volume Manager
  - Shared QFS
  - SRDF consistency groups

`solaris10` Branded Zone Clusters and EMC SRDF

SRDF for data replication is not supported in `solaris10` branded zone clusters.

Hitachi Data Systems Support for Oracle Solaris Cluster Geographic Edition

Hitachi Data Systems (HDS) provides support for replicating data in Oracle Solaris Cluster Geographic Edition environments.

For support information, see the Oracle Solaris Cluster Storage Partner Program page.

♦♦♦ **C H A P T E R 9**

9

Server Support for Oracle Solaris Cluster

and list the servers that support Oracle Solaris Cluster. Other components, such as storage and network interfaces, may not be all supported with every server. Refer to the other chapters for information on those components.

Unless noted in the following tables, Oracle Solaris requirements are as documented in the respective server product documentation.

SPARC Servers That Support Oracle Solaris Cluster

TABLE 60   SPARC Servers for Oracle Solaris Cluster

Servers	Notes
SPARC T7 Series servers	Starting with Oracle Solaris Cluster 4.3
SPARC M8 Series servers	Starting with Oracle Solaris Cluster 4.3 SRU 7
SPARC T8 Series servers	Starting with Oracle Solaris Cluster 4.3 SRU 7
Fujitsu SPARC M12-1 Fujitsu SPARC M12-2 Fujitsu SPARC M12-2S	Starting with: ■ Oracle Solaris Cluster 4.1 with SRU 4.1.8 and later ■ Oracle Solaris Cluster 4.2 with SRU 4.2.5.1.0 and later ■ Oracle Solaris Cluster 4.3 and later SRUs Starting with: ■ Oracle Solaris 11.1 with SRU 11.1.21.4.1 and later ■ Oracle Solaris 11.2 with SRU 11.2.15.5.1 and later ■ Oracle Solaris 11.3 and later SRUs
Fujitsu M10 servers	Starting with Oracle Solaris Cluster 4.1
Netra SPARC T3-1	
Netra SPARC T3-1B	
Netra SPARC T4-1	
Netra SPARC T4-1B	

Servers	Notes
Netra SPARC T4-2	
Netra SPARC T5-1B	Starting with Oracle Solaris Cluster 4.1
SPARC Enterprise M3000	
SPARC Enterprise M4000	
SPARC Enterprise M5000	
SPARC Enterprise M8000	
SPARC Enterprise M9000	
SPARC M5-32 server	Starting with Oracle Solaris Cluster 4.1 SRU 1
SPARC M6-32 server	Starting with Oracle Solaris Cluster 4.1 SRU 3
SPARC M7-8 server	Starting with Oracle Solaris Cluster 4.3
SPARC M7-16 server	Starting with Oracle Solaris Cluster 4.3
SPARC S7-2 server	Starting with Oracle Solaris Cluster 4.3 SRU 3
SPARC S7-2L server	Starting with Oracle Solaris Cluster 4.3 SRU 3
SPARC T3-1 server	
SPARC T3-1B	
SPARC T3-2 server	
SPARC T3-4 server	
SPARC T4-1 server	
SPARC T4-1B	
SPARC T4-2 server	
SPARC T4-4 server	
SPARC T5-1B server module	Starting with Oracle Solaris Cluster 4.1
SPARC T5-2 server	Starting with Oracle Solaris Cluster 4.1
SPARC T5-4 server	Starting with Oracle Solaris Cluster 4.1
SPARC T5-8 server	Starting with Oracle Solaris Cluster 4.1
Sun Blade T6300	
Sun Blade T6320	
Sun Blade T6340	
Sun Fire T1000	
Sun Fire T2000	
Sun Netra CP3060	
Sun Netra CP3260	
Sun Netra T2000	
Sun Netra T5220	
Sun Netra T5440	
Sun SPARC Enterprise T1000	

Servers	Notes
Sun SPARC Enterprise T2000	
Sun SPARC Enterprise T5120	
Sun SPARC Enterprise T5140	
Sun SPARC Enterprise T5220	
Sun SPARC Enterprise T5240	
Sun SPARC Enterprise T5440	

x64 Servers That Support Oracle Solaris Cluster

TABLE 61   x64 Servers for Oracle Solaris Cluster

Servers	Notes
Netra Blade X3-2B	Formerly Sun Netra X6270 M3 Server Blade
Netra Server X3-2	Formerly Sun Netra X4270 M3
Netra Server X5-2	■ Starting with Oracle Solaris Cluster 4.3 SRU 4 ■ Starting with Oracle Solaris 11.3 SRU 8
Oracle Server X5-2	■ Starting with Oracle Solaris Cluster 4.1 SRU 8 ■ See footnote [a]
Oracle Server X5-2L	■ Starting with Oracle Solaris Cluster 4.1 SRU 8 ■ See footnote [a]
Oracle Server X5-4	■ Starting with Oracle Solaris Cluster 4.2 ■ See footnote [a]
Oracle Server X5-8	■ Starting with Oracle Solaris Cluster 4.3 ■ Starting with Oracle Solaris 11.3
Oracle Server X6-2	Starting with Oracle Solaris Cluster 4.3
Oracle Server X6-2L	Starting with Oracle Solaris Cluster 4.3
Oracle Server X7-2	Starting with Oracle Solaris Cluster 4.3
Oracle Server X7-2L	Starting with Oracle Solaris Cluster 4.3
Sun Blade X3-2B	Formerly Sun Blade X6270 M3 Server Module
Sun Blade X4-2B	Starting with Oracle Solaris Cluster 4.1
Sun Blade X6220	
Sun Blade X6240	
Sun Blade X6250	
Sun Blade X6270	
Sun Blade X6270 M2	
Sun Blade X6440	

Servers	Notes
Sun Blade X6450	
Sun Fire X4140	
Sun Fire X4150	
Sun Fire X4170	
Sun Fire X4170 M2	
Sun Fire X4240	
Sun Fire X4250	
Sun Fire X4270	
Sun Fire X4270 M2	
Sun Fire X4275	
Sun Fire X4440	
Sun Fire X4450	
Sun Fire X4540	
Sun Fire X4600	
Sun Fire X4600 M2	
Sun Fire X4800	
Sun Netra X4250	
Sun Netra X4270	
Sun Netra X6270 M2	
Sun Server X2-4	Formerly Sun Fire X4470 M2
Sun Server X2-8	Formerly Sun Fire X4800 M2
Sun Server X3-2	
Sun Server X3-2L	
Sun Server X4-2	Starting with Oracle Solaris Cluster 4.1
Sun Server X4-2L	Starting with Oracle Solaris Cluster 4.1
Sun Server X4-4	Starting with Oracle Solaris Cluster 4.1
Sun Server X4-8	Starting with Oracle Solaris Cluster 4.1

a – Refer to Oracle Solaris Cluster 4.x Show Oracle 1.6TB NVMe SSD Disk as "Fail" and 'cldev' as "does not match physical device ID for" (Doc ID 2009115.1) on My Oracle Support when using NVM Express (NVMe) flash drives in the Oracle Server disk drive bay.

10

Storage on Oracle Solaris Cluster

The focus of this chapter is on cluster shared storage, also referred to as multi-hosted storage.

Storage products are typically supported with a specific set of servers, HBAs, and possibly SAN switches. The information in this chapter summarizes the combinations qualified for Oracle Solaris Cluster. Consult the storage, HBA, SAN switches, and server product information for details.

Quorum Devices on Oracle Solaris Cluster

Unless noted otherwise, all supported shared storage devices can act as quorum devices. See the specific storage product discussion for details.

Oracle Solaris Cluster Quorum Server software can also be used to satisfy cluster quorum requirements. See "Oracle Solaris Cluster Quorum Server Software" on page 24.

Supported Fibre Channel (FC) Storage Devices on Oracle Solaris Cluster

This section lists the FC storage devices supported with Oracle Solaris Cluster and the servers that can share these storage devices in clusters. After you have determined that your server and storage combination is supported, refer to the storage details section for other supported components.

FC Storage Devices for SPARC and x86 Servers

The following list shows the fibre channel storage devices that Oracle Solaris Cluster supports, and points to support details:

- Oracle FS1-2 Flash Storage System – Support details in "Oracle FS1-2 Flash Storage System for FC Storage" on page 131
- Oracle ZFS Storage Appliance – Support details in "Oracle ZFS Storage Appliance on Fibre Channel" on page 132
- Pillar Axiom 600 – Support details in "Pillar Axiom 600 for FC Storage" on page 135
- Sun Storage 2540-M2 Array – Support details in "Sun Storage 2540-M2 Array for FC Storage" on page 136
- Sun Storage 6180, 6580, 6780 Arrays – Support details in "Sun Storage 6180, 6580, 6780 Arrays for FC Storage" on page 137

SPARC Servers That Support FC Storage Devices

With the exception of Fujitsu systems, the following SPARC servers support all FC storage devices listed in "FC Storage Devices for SPARC and x86 Servers" on page 126. Fujitsu systems do not support the Sun Storage 2540-M2 Array or the Sun Storage 6180, 6580, 6780 Arrays.

- Fujitsu M10-1, Fujitsu M10-4, Fujitsu SPARC M12-2, Fujitsu SPARC M12-2S
- SPARC M8-8
- SPARC T8-1, SPARC T8-2, SPARC T8-4
- Netra SPARC T3-1, Netra SPARC T3-1B, Netra SPARC T4-1, Netra SPARC T4-1B, Netra SPARC T4-2, Netra SPARC T5-1B
- SPARC Enterprise M3000, SPARC Enterprise M4000, SPARC Enterprise M5000, SPARC Enterprise M8000, SPARC Enterprise M9000
- SPARC M5-32 server, SPARC M6-32 server
- SPARC M7-8 server, SPARC M7-16 server
- SPARC S7-2 server, SPARC S7-2L server
- SPARC T3-1 server, SPARC T3-1B, SPARC T3-2 server, SPARC T3-4 server
- SPARC T4-1 server, SPARC T4-1B, SPARC T4-2 server, SPARC T4-4 server
- SPARC T5-1B server module, SPARC T5-2 server, SPARC T5-4 server, SPARC T5-8 server
- SPARC T7-1 server, SPARC T7-2 server, SPARC T7-4 server
- Sun Blade T6300, Sun Blade T6320, Sun Blade T6340

- Sun Fire T1000, Sun Fire T2000
- Sun Netra CP3060, Sun Netra CP3260
- Sun Netra T2000, Sun Netra T5220, Sun Netra T5440
- Sun SPARC Enterprise T1000, Sun SPARC Enterprise T2000, Sun SPARC Enterprise T5120, Sun SPARC Enterprise T5140, Sun SPARC Enterprise T5220, Sun SPARC Enterprise T5240, Sun SPARC Enterprise T5440
- Sun Fire T1000

x64 Servers That Support FC Storage Devices

The following x64 servers support all FC storage devices listed in "FC Storage Devices for SPARC and x86 Servers" on page 126:

- Netra Blade X3-2B, Netra Blade X3-2B, Netra Server X3-2, Netra Server X5-2
- Oracle Server X5-2, Oracle Server X5-2L, Oracle Server X5-4, Oracle Server X5-8
- Oracle Server X6-2, Oracle Server X6-2L
- Oracle Server X7-2, Oracle Server X7-2L
- Sun Blade X3-2B, Sun Blade X4-2B
- Sun Blade X6220, Sun Blade X6240, Sun Blade X6250, Sun Blade X6270r, Sun Blade X6270 M2, Sun Blade X6440
- Sun Fire X4140, Sun Fire X4150, Sun Fire X4170, Sun Fire X4170 M2, Sun Fire X4240, Sun Fire X4250, Sun Fire X4270, Sun Fire X4270 M2, Sun Fire X4275, Sun Fire X4440, Sun Fire X4450, Sun Fire X4470, Sun Fire X4540, Sun Fire X4600, Sun Fire X4600 M2, Sun Fire X4800
- Sun Netra X4250, Sun Netra X4270, Sun Netra X6270 M2
- Sun Server X2-4, Sun Server X2-8, Sun Server X3-2, Sun Server X3-2L, Sun Server X4-2, Sun Server X4-2L, Sun Server X4-4, Sun Server X4-8

Supported Ethernet-Connected Storage Devices on Oracle Solaris Cluster

See Chapter 12, "Ethernet Storage Support on Oracle Solaris Cluster".

Supported InfiniBand-Connected Storage Devices on Oracle Solaris Cluster

See Chapter 13, "InfiniBand Storage Support".

Third-Party Storage on Oracle Solaris Cluster

For information about supported third-party storage, see the Oracle Solaris Cluster Storage Partner Program (`http://www.oracle.com/technetwork/server-storage/solaris-cluster/partnerprogram-cluster-168135.pdf`) page.

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11

Fibre Channel Storage Support on Oracle Solaris Cluster

This chapter discusses Fibre Channel storage support on Oracle Solaris Cluster.

Fibre Channel Configuration Support on Oracle Solaris Cluster

This section pertains to direct-attached and SAN-switch-connected shared storage support.

Server/HBA/Switch/Storage Support

Using supported storage switches, you can connect supported Fibre Channel (FC) storage devices and supported servers on a Storage Area Network (SAN) configuration. These configurations are supported with Oracle Solaris Cluster as long as they are within the range of supported devices and limitations listed in this chapter, as well as the respective server or component support requirements. Supported configurations are composed of supported servers, FC HBAs, switches and storage devices.

Supported FC Storage

Basic supported storage-server combinations are listed in "Supported Fibre Channel (FC) Storage Devices on Oracle Solaris Cluster" on page 125. For additional information, refer to the section in this chapter for the particular storage device.

Supported FC Host Bus Adapters (HBAs)

FC HBAs supported with Oracle Solaris Cluster are listed below. Check the server, HBA, switch, and storage product documentation for supported combinations. Refer to the individual storage device sections in this chapter for exceptions.

32Gb HBAs

PCIe

- 7115461 Oracle Storage Dual-Port 16Gb or 32Gb Fibre Channel PCIe HBA, Emulex
- 7115462 Oracle Storage Dual-Port 16Gb or 32Gb Fibre Channel PCIe HBA, QLogic

16Gb HBAs

PCIe

- 7101674 (PTO), 7101673 (ATO) Sun Storage 16 Gb FC PCIe Universal HBA
- 7101684 (PTO), 7101683 (ATO) Sun Storage 16 Gb FC PCIe Universal HBA, Emulex

PCIe ExpressModule

- 7101682 (PTO), 7101681 (ATO) Sun Storage 16 Gb FC ExpressModule Universal HBA
- 7101689 (PTO), 7101690 (ATO) Sun Storage 16 Gb FC ExpressModule Universal HBA, Emulex

8Gb HBAs

PCIe

- SG-(X)PCIE1FC-EM8-Z
- SG-(X)PCIE2FC-EM8-Z
- SG-(X)PCIE1FC-QF8-Z
- SG-(X)PCIE2FC-QF8-Z

PCIe ExpressModule

- SG-(X)PCIEFCGBE-E8-Z
- SG-(X)PCIEFCGBE-Q8-Z

Oracle FS1-2 Flash Storage System for FC Storage

Node Connectivity Limits

A LUN from the Oracle FS1-2 flash storage system can be accessed by up to 4 nodes.

RAID Requirements for Oracle FS1-2 Flash Storage

There are no Oracle Solaris Cluster specific requirements.

Software, Firmware, and Patches for Oracle FS1-2 Flash Storage

- Starting with Oracle Solaris Cluster 4.2
- Starting with Oracle Solaris 11.2

Campus Cluster and Oracle FS1-2 Flash Storage

Campus clusters are supported.

Oracle Virtual Networking and Oracle FS1-2 Flash Storage

Oracle Virtual Networking is supported. See Chapter 14, "Oracle Virtual Networking" on page 149 for information.

Oracle FS1-2 Flash Storage System Server Support

Oracle Solaris Cluster supports any server qualified as a cluster node, with any Oracle Solaris Cluster qualified FC HBA supported by that server and Oracle FS1-2 flash storage, provided

the requirements for Oracle Solaris Cluster release, Oracle Solaris release, patches, and others are met.

Oracle ZFS Storage Appliance on Fibre Channel

Configuration Requirements for FC Storage

The following ZFS storage appliances can be used by Oracle Solaris Cluster:

Oracle ZFS Storage Appliance models:

- Oracle ZFS Storage ZS3-2 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS3-4 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS3-BA (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS4-4 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS5-2 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS5-4 (single-controller and dual-controller configurations)

Sun ZFS Storage Appliance models:

- Sun ZFS Storage 7120
- Sun ZFS Storage 7320 (single-controller and dual-controller configurations)
- Sun ZFS Storage 7420 (single-controller and dual-controller configurations)

Sun Storage 7000 Unified Storage System models:

- Sun Storage 7110
- Sun Storage 7210
- Sun Storage 7310 (single-controller and dual-controller configurations)
- Sun Storage 7410 (single-controller and dual-controller configurations)

Oracle ZFS Storage Appliance with direct-attached storage (DAS) requires:

- Oracle Solaris Cluster 4.3 (and SRUs)
- Oracle Solaris 11.3 (and SRUs)
- Oracle ZFS Storage Appliance software AK 2013.1.5 and later supported versions

See Oracle Solaris Cluster 4.x Requirements when using direct attached Fiber Channel Oracle ZFS SA (Doc ID 2110240.1) on My Oracle Support for additional information.

Node Connectivity Limits for FC Storage

A maximum of eight nodes can be connected to any one LUN.

RAID Requirements for FC Storage

There are no Oracle Solaris Cluster specific requirements.

Software, Firmware, and Patches for FC Storage

Oracle ZFS Storage Appliance support starts with Sun ZFS Storage Software 2010.Q3.3.1

See the following table for supported Oracle ZFS Storage Appliance software releases.

TABLE 62   Oracle Solaris Cluster 4: Oracle ZFS Storage Appliance Software for Fibre Channel Connected Storage

Oracle ZFS Storage Appliance Software Release Name	Oracle Solaris Cluster 4.3[a]	Oracle Solaris Cluster 4.2[a]	Oracle Solaris Cluster 4.1[b]	Oracle Solaris Cluster 4.0[c]
2013.1.7.x[d]	Y			
2013.1.6.x	Y	Y		
2013.1.5.x	Y	Y		
2013.1.4.x	Y	Y		
2013.1.3.x		Y		
2013.1.2.x		Y	Y	
2013.1.1.x		Y	Y	
2013.1.0.x		Y	Y	
2011.1.9.x		Y	Y	
2011.1.8.x		Y	Y	
2011.1.7.x		Y	Y	
2011.1.6.x		Y	Y	
2011.1.5.x		Y	Y	Y

- a – With Oracle Solaris 11.2 or 11.3
- b – With Oracle Solaris 11.2 only
- c – With Oracle Solaris 11.0 only

- d – Starting with Oracle Solaris Cluster 4.3 SRU 8

See the Oracle ZFS Storage Appliance documents for Oracle ZFS Storage Appliance requirements.

Campus Cluster for FC Storage

Campus clusters are supported.

Oracle Solaris Cluster Geographic Edition for FC Storage

Oracle Solaris Cluster Geographic Edition is supported. See Chapter 8, "Oracle Solaris Cluster Geographic Edition".

Oracle Virtual Networking for FC Storage

Oracle Virtual Networking is supported. For more information, see Chapter 15, "Oracle Virtual Networking on Oracle Solaris Cluster".

Supported models:

- Oracle ZFS Storage Appliance: ZS3-2, ZS3-4
- Sun ZFS Storage Appliance: 7120, 7320, 7420

Oracle ZFS Storage Appliance Server Support

Oracle Solaris Cluster supports any server qualified as a cluster node, with any Oracle Solaris Cluster qualified FC HBA supported by that server and Oracle ZFS Storage Appliance, provided the requirements for Oracle Solaris Cluster release, Oracle Solaris release, patches, and others are met.

Pillar Axiom 600 for FC Storage

Pillar Axiom 600 Configuration Requirements for FC Storage

Node Connectivity Limits for Pillar Axiom 600

A LUN from the Axiom 600 can be accessed by up to 4 nodes.

RAID Requirements for Pillar Axiom 600

There are no Oracle Solaris Cluster specific requirements.

Software, Firmware, and Patches for Pillar Axiom 600

SPARC support:

- Starting with Axiom 600 release 5.2
- Starting with Oracle Solaris Cluster 4.0
- Starting with Solaris 11 SRU 2

x64 support:

- Starting with Axiom 600 release 5.4
- Starting with Oracle Solaris Cluster 4.1
- Starting with Solaris 11.1

Campus Cluster

Campus clusters are supported.

Oracle Virtual Networking

Oracle Virtual Networking is supported. See Chapter 15, "Oracle Virtual Networking on Oracle Solaris Cluster".

Pillar Axiom 600 Server Support

Oracle Solaris Cluster supports any server qualified as a cluster node, with any Oracle Solaris Cluster qualified FC HBA supported by that server and Pillar 600, provided the requirements for Oracle Solaris Cluster release, Oracle Solaris release, patches, and others are met.

Sun Storage 2540-M2 Array for FC Storage

Sun Storage 2540-M2 Configuration Requirements

Node Connectivity Limits for Sun Storage 2540-M2

A LUN from the Sun Storage 2540-M2 can be accessed by up to 4 nodes when connected using DAS cabling, 8 nodes when through a SAN.

RAID Requirements for Sun Storage 2540-M2

There are no Oracle Solaris Cluster specific requirements.

Software, Firmware, and Patches for Sun Storage 2540-M2

- Oracle Solaris Cluster 4.0 and later
- Firmware 07.84.44.10 (patch 147660-04) and later
- See the Sun Storage 2540-M2 and CAM Release Notes for information about operation in Oracle Solaris 11 environments

Campus Cluster and Sun Storage 2540-M2

Campus clusters are supported.

Sun Storage 2540-M2 Server Support

Oracle Solaris Cluster supports any server qualified as a cluster node, with any Oracle Solaris Cluster qualified FC HBA supported by that server and Sun Storage 2540-M2, provided the

requirements for Oracle Solaris Cluster release, Oracle Solaris release, patches, and others are met.

Sun Storage 6180, 6580, 6780 Arrays for FC Storage

Sun Storage 6180, 6580, 6780 Configuration Requirements

Node Connectivity Limits for Sun Storage 6180, 6580, 6780

A LUN from the Sun Storage 6180 can be accessed by up to 4 nodes when connected using DAS cabling, 8 nodes when through a SAN.

A LUN from the Sun Storage 6580/6780 can be accessed by up to 8 nodes.

RAID Requirements for Sun Storage 6180, 6580, 6780

There are no Oracle Solaris Cluster specific requirements.

Software, Firmware, and Patches for Sun Storage 6180, 6580, 6780

- Starting with Oracle Solaris Cluster 4.0
- Requires at least firmware 07.84.44.10 (patch 147660-04)
- See the Sun Storage 6180, 6580/6780, and CAM Release Notes for information about operation in Oracle Solaris 11 environments

Campus Cluster and Sun Storage 6180, 6580, 6780

Campus clusters are supported.

Sun Storage 6180, 6580, 6780 Server Support

Oracle Solaris Cluster supports any server qualified as a cluster node, with any Oracle Solaris Cluster qualified FC HBA supported by that server and Sun Storage 6180/6580/6780 arrays, provided the requirements for Oracle Solaris Cluster release, Oracle Solaris release, patches, and others are met.

♦♦♦ **C H A P T E R   1 2**

12

Ethernet Storage Support on Oracle Solaris Cluster

This chapter covers Oracle Solaris Cluster supported Ethernet-connected shared storage devices.

Oracle ZFS Storage Appliance on Ethernet Requirements

Oracle ZFS Storage Appliance Configuration Requirements

The following ZFS storage appliances can be used by Oracle Solaris Cluster:

Oracle ZFS Storage Appliance models:

- Oracle ZFS Storage ZS3-2 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS3-4 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS4-4 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS5-2 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS5-4 (single-controller and dual-controller configurations)

Sun ZFS Storage Appliance models:

- Sun ZFS Storage 7120
- Sun ZFS Storage 7320 (single-controller and dual-controller configurations)
- Sun ZFS Storage 7420 (single-controller and dual-controller configurations)

Sun Storage 7000 Unified Storage System models:

- Sun Storage 7110
- Sun Storage 7210

- Sun Storage 7310 (single-controller and dual-controller configurations)
- Sun Storage 7410 (single-controller and dual-controller configurations)

The Oracle ZFS Storage Appliance (Ethernet) can be used as an iSCSI block device or as an NFS NAS device.

- The Oracle ZFS Storage Appliance NFS NAS device must be directly connected through the same subnet to all nodes of the cluster.
- When configuring a Oracle ZFS Storage Appliance iSCSI LUN as a quorum device, the Oracle ZFS Storage Appliance must be on the same network (same subnet) as the cluster nodes.

Node Connectivity Limits

A maximum of eight nodes can be connected to any one iSCSI LUN.

RAID Requirements

There are no Oracle Solaris Cluster specific requirements.

Software, Firmware, and Patches

Oracle ZFS Storage Appliance (Ethernet) support starts with Sun ZFS Storage Software 2010. Q3.3.

See the following table for supported Oracle ZFS Storage Appliance software releases.

TABLE 63   Oracle Solaris Cluster 4: Oracle ZFS Storage Appliance Software for Ethernet-Connected Storage

Oracle ZFS Storage Appliance Software Release Name	Oracle Solaris Cluster 4.3[b]	Oracle Solaris Cluster 4.2[b]	Oracle Solaris Cluster 4.1[c]	Oracle Solaris Cluster 4.0[d]
2013.1.7.x[e]	Y			
2013.1.6.x	Y	Y		
2013.1.5.x	Y	Y		
2013.1.4.x	Y	Y		
2013.1.3.x		Y		
2013.1.2.x		Y	Y	

Oracle ZFS Storage Appliance Software Release Name	Oracle Solaris Cluster 4.3[b]	Oracle Solaris Cluster 4.2[b]	Oracle Solaris Cluster 4.1[c]	Oracle Solaris Cluster 4.0[d]
2013.1.1.x		Y	Y	
2013.1.0.x		Y	Y	
2011.1.9.x[a]		Y	Y	
2011.1.8.x		Y	Y	
2011.1.7.x		Y	Y	
2011.1.6.x		Y	Y	
2011.1.5.x		Y	Y	Y

- a – NFS only
- b – With Oracle Solaris 11.2 or 11.3
- c – With Oracle Solaris 11.2 only
- d – With Oracle Solaris 11.0 only
- e – Starting with Oracle Solaris Cluster 4.3 SRU 8

See the Oracle ZFS Storage Appliance documents for Oracle ZFS Storage Appliance requirements.

Oracle Virtual Networking

Oracle Virtual Networking is supported. See Chapter 15, "Oracle Virtual Networking on Oracle Solaris Cluster" for information.

Supported models:

- Oracle ZFS Storage Appliance: ZS3-2, ZS3-4
- Sun ZFS Storage Appliance: 7120, 7320, 7420

Oracle ZFS Storage Appliance Server Support

Oracle Solaris Cluster supports any server qualified as a cluster node, with any Oracle Solaris Cluster qualified FC HBA supported by that server and Oracle ZFS Storage Appliance, provided the requirements for Oracle Solaris Cluster release, Oracle Solaris release, patches, and others are met.

13

InfiniBand Storage Support

This chapter covers Oracle Solaris Cluster supported InfiniBand-connected shared storage devices.

Oracle ZFS Storage Appliance on InfiniBand

Oracle ZFS Storage Appliance Configuration Requirements

The following ZFS storage appliances can be used by Oracle Solaris Cluster:

Oracle ZFS Storage Appliance models:

- Oracle ZFS Storage ZS3-2 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS3-4 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS4-4 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS5-2 (single-controller and dual-controller configurations)
- Oracle ZFS Storage ZS5-4 (single-controller and dual-controller configurations)

Sun ZFS Storage Appliance models:

- Sun ZFS Storage 7120
- Sun ZFS Storage 7320 (single-controller and dual-controller configurations)
- Sun ZFS Storage 7420 (single-controller and dual-controller configurations)

Sun Storage 7000 Unified Storage System models:

- Sun Storage 7110
- Sun Storage 7210
- Sun Storage 7310 (single-controller and dual-controller configurations)
- Sun Storage 7410 (single-controller and dual-controller configurations)

The Oracle ZFS Storage Appliance an be used as an iSCSI block device or as an NFS NAS device when connected using IP over InfiniBand (IPoIB).

Node Connectivity Limits

A maximum of eight nodes can be connected to any one iSCSI LUN.

RAID Requirements

There are no Oracle Solaris Cluster specific requirements.

Software, Firmware, and Patches

The following table describes the supported Oracle ZFS Storage Appliance software releases.

TABLE 64   Oracle Solaris Cluster 4: Oracle ZFS Storage Appliance Software for InfiniBand-Connected Storage

Oracle ZFS Storage Appliance Software Release Name	Oracle Solaris Cluster 4.3[a]	Oracle Solaris Cluster 4.2[a]	Oracle Solaris Cluster 4.1[b]	Oracle Solaris Cluster 4.0[c]
2013.1.7.x[d]	Y			
2013.1.6.x	Y	Y		
2013.1.5.x	Y	Y		
2013.1.4.x	Y	Y		
2013.1.3.x		Y		
2013.1.2.x		Y	Y	
2013.1.1.x		Y	Y	
2013.1.0.x		Y	Y	
2011.1.9.x		Y	Y	
2011.1.6.x		Y	Y	
2011.1.4.x				Y
2011.1.3.x				Y
2011.1.1.x				Y

- a – With Oracle Solaris 11.2 or 11.3
- b – With Oracle Solaris 11.2 only

- c – With Oracle Solaris 11.0 only
- d – Starting with Oracle Solaris Cluster 4.3 SRU 8

See the Oracle ZFS Storage Appliance documents for Oracle ZFS Storage Appliance requirements.

Oracle ZFS Storage Appliance Server Support

Oracle Solaris Cluster supports any server qualified as a cluster node, with any Oracle Solaris Cluster qualified FC HBA supported by that server and Oracle ZFS Storage Appliance, provided the requirements for Oracle Solaris Cluster release, Oracle Solaris release, patches, and others are met.

14

Network Configuration on Oracle Solaris Cluster

This chapter covers support for the cluster interconnect and public networking. For more information about these subjects, see the Oracle Solaris Cluster documentation, and especially the *Oracle Solaris Cluster Hardware Administration Manual*.

Network Interfaces for Oracle Solaris Cluster

The tables in this chapter cover network interfaces supported for the cluster interconnect or public networks. The network interfaces are grouped by protocol, Ethernet and InfiniBand. Coverage includes information about supported cabling and network switches.

- "Ethernet Network Interfaces on Oracle Solaris Cluster" on page 147
- "InfiniBand Support" on page 162
- "Network Cables and Switches on Oracle Solaris Cluster" on page 163

For Oracle Virtual Networking support, see Chapter 15, "Oracle Virtual Networking on Oracle Solaris Cluster".

Ethernet Network Interfaces on Oracle Solaris Cluster

The PCIe Ethernet interfaces that can be used for Oracle Solaris Cluster networking are listed in the following sections:

- "Tables of PCIe Ethernet Interfaces for SPARC Servers and x64 Servers" on page 148
- "Tables of PCIe ExpressModule Ethernet Interfaces for SPARC Servers and x64 Servers" on page 157
- "Tables of NEM and XAUI Interfaces for Oracle Solaris Servers" on page 160

Tables of PCIe Ethernet Interfaces for SPARC Servers and x64 Servers

The PCIe Ethernet interfaces that can be used for Oracle Solaris Cluster on SPARC servers and x64 servers are listed in the following tables:

TABLE 65   PCIe Ethernet Interfaces for SPARC Servers – PTO and ATO

Servers	Onboard Ethernet Ports	7100477 (PTO), 7100479 (ATO) Sun Quad Port GbEPCIe 2.0 LP Adapter, UTP	7100481 (PTO), 7100482 (ATO) Sun Dual Port GbEPCIe 2.0 LP Adapter, MMF	7100488 (PTO), 7100563 (ATO) Sun Dual Port 10GBase-TAdapter	7101674 (PTO), 7101673 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA[d]	7101684 (PTO), 7101683 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA, Emulex[d]	7114134 (PTO), 7114148 (ATO) Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter[e]
Fujitsu M10 servers	Y	Y	Y	Y	Y	Y	Y
Fujitsu SPARC M12 Series	Y	Y	Y	Y	Y	Y	Y
SPARC M8-8[f]	Y	Y			Y	Y	Y
SPARC T8 Series[f]	Y	Y			Y	Y	Y
Netra SPARC T3-1	Y						
Netra SPARC T4-1	Y	Y	Y	Y			
Netra SPARC T4-2	Y	Y	Y	Y			
SPARC Enterprise M3000	Y						
SPARC Enterprise M4000	Y						
SPARC Enterprise M5000	Y						
SPARC Enterprise M8000	Y						

Servers	Onboard Ethernet Ports	7100477 (PTO), 7100479 (ATO) Sun Quad Port GbEPCIe 2.0 LP Adapter, UTP	7100481 (PTO), 7100482 (ATO) Sun Dual Port GbEPCIe 2.0 LP Adapter, MMF	7100488 (PTO), 7100563 (ATO) Sun Dual Port 10GBase-TAdapter	7101674 (PTO), 7101673 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA[d]	7101684 (PTO), 7101683 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA, Emulex[d]	7114134 (PTO), 7114148 (ATO) Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter[e]
SPARC Enterprise M9000	Y						
SPARC M5-32 server	Y[a]	Y	Y	Y	Y	Y	
SPARC M6-32 server	Y[a]	Y	Y	Y	Y	Y	
SPARC M7-8 server		Y	Y	Y	Y	Y	Y
SPARC M7-16 server		Y	Y	Y	Y	Y	Y
SPARC S7-2 server	Y[b]	Y	Y	Y	Y	Y	Y
SPARC S7-2L server	Y[b]	Y	Y	Y	Y	Y	Y
SPARC T3-1 server	Y						
SPARC T3-2 server	Y						
SPARC T4-1 server	Y	Y	Y	Y	Y	Y	
SPARC T4-2 server	Y	Y	Y	Y	Y	Y	
SPARC T5-2 server	Y	Y	Y	Y	Y	Y	
SPARC T5-4 server	Y	Y	Y	Y	Y	Y	
SPARC T5-8 server	Y	Y	Y	Y	Y	Y	
SPARC T7-1 server	Y	Y	Y	Y	Y	Y	Y
SPARC T7-2 server	Y	Y	Y	Y	Y	Y	Y
SPARC T7-4 server	Y	Y	Y	Y	Y	Y	Y
Sun Fire T1000	Y						
Sun Fire T2000	Y						
Sun Netra CP3060	Y						

Servers	Onboard Ethernet Ports	7100477 (PTO), 7100479 (ATO) Sun Quad Port GbEPCIe 2.0 LP Adapter, UTP	7100481 (PTO), 7100482 (ATO) Sun Dual Port GbEPCIe 2.0 LP Adapter, MMF	7100488 (PTO), 7100563 (ATO) Sun Dual Port 10GBase-TAdapter	7101674 (PTO), 7101673 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA[d]	7101684 (PTO), 7101683 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA, Emulex[d]	7114134 (PTO), 7114148 (ATO) Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter[e]
Sun Netra CP3260	Y[c]						
Sun Netra T2000	Y						
Sun Netra T5220	Y						
Sun Netra T5440	Y						
Sun SPARC Enterprise T1000	Y						
Sun SPARC Enterprise T2000	Y						
Sun SPARC Enterprise T5120	Y						
Sun SPARC Enterprise T5140	Y						
Sun SPARC Enterprise T5220	Y						
Sun SPARC Enterprise T5240	Y						
Sun SPARC Enterprise T5440	Y						

- a – SPARC M Series Server Base I/O card 7104497(PTO), 7104496(ATO)
- b – Support starts with Oracle Solaris Cluster 4.3 SRU 4
- c – Base and Extended Fabrics, and Sun Netra CP3200 ARTM-FC-Z (XCP32X0-RTM-FC-Z)
- d – Support starts with Oracle Solaris Cluster 4.1 and Oracle Solaris 11.1 (with card-specified SRU)
- e – 10GbE only; support starts with Oracle Solaris Cluster 4.3 SRU 4, Oracle Solaris 11.3 SRU 8
- f – The SPARC M8 and SPARC T8 Series support the Sun Dual Port 10G Base-T Adapter (7111181)

The following table covers PCI Ethernet Interfaces of type Sun Storage, Sun Dual, PCIe, and Gigabit for SPARC servers.

Note - For Onboard Ethernet ports on SPARC servers, see .

TABLE 66   PCIe Ethernet Interfaces for SPARC Servers – PCIe and Gigabit Ethernet

Servers	SG-(X) PCIEFCOE2-Q-TA/7105382 Sun Storage 10 GbEPCIe FCoE CNA: QLogic LP, dual port, Twin-AX[d]	(X)1027A-Z Sun Dual 10 GbE XFP PCIe LP Adapter	(X)1109A-Z Sun Dual 10 GbE SFP + PCIe 2.0 LP Adapter	(X)4447A-Z x8 PCIe Quad Gigabit Ethernet	(X) 7280A-2 Gigabit Ethernet UTP PCIe	(X) 7281A-2 Gigabit Ethernet MMF PCIe
Fujitsu M10 servers	Y		Y	Y		Y
Fujitsu SPARC M12 Series	Y		Y	Y		Y
SPARC M8-8			Y			
SPARC T8 Series			Y			
Netra SPARC T3-1	Y	Y	Y	Y	Y	Y
Netra SPARC T4-1			Y	Y	Y	Y
Netra SPARC T4-2			Y			
SPARC Enterprise M3000	Y	Y		Y	Y	Y
SPARC Enterprise M4000	Y	Y		Y	Y	Y
SPARC Enterprise M5000	Y	Y		Y	Y	Y
SPARC Enterprise M8000	Y	Y		Y	Y	Y
SPARC Enterprise M9000	Y	Y		Y	Y	Y
SPARC M5-32 server	Y		Y			
SPARC M6-32 server	Y		Y			
SPARC M7-8 server			Y			
SPARC M7-16 server			Y			
SPARC S7-2 server			Y			
SPARC S7-2L server			Y			
SPARC T3-1 server	Y		Y	Y	Y	Y
SPARC T3-2 server	Y		Y	Y	Y	Y
SPARC T4-1 server	Y		Y	Y		Y
SPARC T4-2 server	Y		Y	Y		Y
SPARC T5-2 server	Y		Y			
SPARC T5-4 server	Y		Y			
SPARC T5-8 server	Y		Y			
SPARC T7-1 server			Y			
SPARC T7-2 server			Y			

Servers	SG-(X) PCIEFCOE2-Q-TA/7105382 Sun Storage 10 GbEPCIe FCoE CNA: QLogic LP, dual port, Twin-AX[d]	(X)1027A-Z Sun Dual 10 GbE XFP PCIe LP Adapter	(X)1109A-Z Sun Dual 10 GbE SFP + PCIe 2.0 LP Adapter	(X)4447A-Z x8 PCIe Quad Gigabit Ethernet	(X) 7280A-2 Gigabit Ethernet UTP PCIe	(X) 7281A-2 Gigabit Ethernet MMF PCIe
SPARC T7-4 server			Y			
Sun Fire T1000		Y		Y		
Sun Fire T2000		Y		Y	Y	Y
Sun Netra CP3060						
Sun Netra CP3260						
Sun Netra T2000		Y		Y	Y	Y
Sun Netra T5220				Y	Y	Y
Sun Netra T5440				Y	Y	Y
Sun SPARC Enterprise T1000		Y		Y		
Sun SPARC Enterprise T2000		Y		Y	Y	Y
Sun SPARC Enterprise T5120		Y		Y	Y	Y
Sun SPARC Enterprise T5140		Y		Y	Y	Y
Sun SPARC Enterprise T5220		Y		Y	Y	Y
Sun SPARC Enterprise T5240		Y		Y	Y	Y
Sun SPARC Enterprise T5440		Y		Y	Y	Y

- d – Support starts with Oracle Solaris Cluster 4.1 and Oracle Solaris 11.1 (with card-specified SRU)

TABLE 67   PCIe Ethernet Interfaces for x64 Servers – PTO and ATO

Servers	Onboard Ethernet Ports	7100477 (PTO), 7100479 (ATO) Sun Quad Port GbEPCIe 2.0 LP Adapter, UTP	7100481 (PTO), 7100482 (ATO) Sun Dual Port GbEPCIe 2.0 LP Adapter, MMF	7100488 (PTO), 7100563 (ATO) Sun Dual Port 10GBase-TAdapter	7101674 (PTO), 7101673 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA[c]	7101684 (PTO), 7101683 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA, Emulex[c]	7114134 (PTO), 7114148 (ATO) Oracle Quad 10 Gb o Dual 40 Gb Ethernet Adapter[b]
Netra Server X3-2	Y	Y	Y		Y	Y	
Netra Server X5-2	Y	Y	Y	Y	Y	Y	Y
Oracle Server X5-2	Y	Y[a]		Y	Y	Y	
Oracle Server X5-2L	Y	Y[a]		Y	Y	Y	
Oracle Server X5-4	Y	Y		Y	Y	Y	Y
Oracle Server X5-8	Y	Y		Y	Y	Y	Y
Oracle Server X6-2	Y	Y		Y	Y	Y	Y
Oracle Server X6-2L	Y	Y		Y	Y	Y	Y
Oracle Server X7-2	Y						Y
Oracle Server X7-2L	Y						Y
Sun Fire X4140	Y						
Sun Fire X4150	Y						
Sun Fire X4170	Y						
Sun Fire X4170 M2	Y						
Sun Fire X4240	Y						
Sun Fire X4250		Y	Y	Y	Y	Y	Y
Sun Fire X4270		Y	Y	Y	Y	Y	Y
Sun Fire X4270 M2	Y						

Servers	Onboard Ethernet Ports	7100477 (PTO), 7100479 (ATO) Sun Quad Port GbEPCIe 2.0 LP Adapter, UTP	7100481 (PTO), 7100482 (ATO) Sun Dual Port GbEPCIe 2.0 LP Adapter, MMF	7100488 (PTO), 7100563 (ATO) Sun Dual Port 10GBase-TAdapter	7101674 (PTO), 7101673 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA[c]	7101684 (PTO), 7101683 (ATO) Sun Storage 16 Gb FCPCIe Universal HBA, Emulex[c]	7114134 (PTO), 7114148 (ATO) Oracle Quad 10 Gb o Dual 40 Gb Ethernet Adapter[b]
Sun Fire X4275	Y						
Sun Fire X4440	Y						
Sun Fire X4450	Y						
Sun Fire X4470	Y						
Sun Fire X4540	Y						
Sun Fire X4600	Y						
Sun Fire X4600 M2	Y						
Sun Netra X4250	Y	Y	Y				
Sun Netra X4270	Y	Y	Y				
Sun Server X2-4	Y	Y	Y				
Sun Server X3-2	Y	Y	Y				
Sun Server X3-2L	Y	Y	Y	Y	Y	Y	
Sun Server X4-2	Y	Y	Y	Y	Y	Y	
Sun Server X4-2L	Y	Y	Y	Y	Y	Y	
Sun Server X4-4	Y	Y		Y	Y	Y	
Sun Server X4-8	Y	Y		Y	Y	Y	

■ a – Server only supports x-option part number 7100447 (not available for factory installation)

- b – 10GbE only; support starts with Oracle Solaris Cluster 4.3 SRU 4, Oracle Solaris 11.3 SRU 8
- c – Support starts with Oracle Solaris Cluster 4.1 and Oracle Solaris 11.1 (with card-specific SRU)

The following table covers PCI Ethernet Interfaces of type Sun Storage, Sun Dual, and Gigabit for x64 servers.

Note - For Onboard Ethernet ports on x64 servers, see Table 67, "PCIe Ethernet Interfaces for x64 Servers – PTO and ATO," on page 153.

TABLE 68   PCIe Ethernet Interfaces for x64 Servers – PCIe and Gigabit Ethernet

Servers	SG-(X) PCIEFCOE2-Q-TA/7105382 Sun Storage 10 GbEPCIe FCoE CNA: QLogic LP, dual port, Twin-AX[c]	(X) 1027A-Z Sun Dual 10 GbE XFP PCIe LP Adapter	(X)1109A-Z Sun Dual 10 GbE SFP + PCIe 2.0 LP Adapter	(X) 4447A-Z x8 PCIe Quad Gigabit Ethernet	(X) 7280A-2 Sun PCIe Dual GigE UTP	(X) 7281A-2 Sun PCIe Dual GigE MMF	7118016 Dual 10/25-Gigabit SFP28 Ethernet
Netra Server X3-2			Y				
Netra Server X5-2			Y				
Oracle Server X5-2			Y				
Oracle Server X5-2L			Y				
Oracle Server X5-4			Y				
Oracle Server X5-8			Y				
Oracle Server X6-2			Y				
Oracle Server X6-2L			Y				
Oracle Server X7-2							Y
Oracle Server X7-2L							Y
Sun Fire X4140	Y	Y			Y	Y	
Sun Fire X4150	Y	Y			Y	Y	
Sun Fire X4170	Y		Y		Y	Y	

Servers	SG-(X) PCIEFCOE2-Q-TA/7105382 Sun Storage 10 GbEPCIe FCoE CNA: QLogic LP, dual port, Twin-AX[c]	(X) 1027A-Z Sun Dual 10 GbE XFP PCIe LP Adapter	(X)1109A-Z Sun Dual 10 GbE SFP + PCIe 2.0 LP Adapter	(X) 4447A-Z x8 PCIe Quad Gigabit Ethernet	(X) 7280A-2 Sun PCIe Dual GigE UTP	(X) 7281A-2 Sun PCIe Dual GigE MMF	7118016 Dual 10/25-Gigabit SFP28 Ethernet
Sun Fire X4170 M2	Y	Y			Y	Y	
Sun Fire X4240	Y	Y		Y	Y	Y	
Sun Fire X4250			Y				
Sun Fire X4270			Y				
Sun Fire X4270 M2	Y		Y		Y		
Sun Fire X4275	Y		Y		Y	Y	
Sun Fire X4440	Y	Y			Y	Y	
Sun Fire X4450	Y	Y		Y	Y		
Sun Fire X4470	Y		Y				
Sun Fire X4540		Y			Y	Y	
Sun Fire X4600					Y	Y	
Sun Fire X4600 M2	Y			Y	Y		
Sun Netra X4250		Y	Y		Y	Y	
Sun Netra X4270	Y		Y			Y	
Sun Server X2-4	Y		Y				
Sun Server X3-2	Y		Y				
Sun Server X3-2L			Y				
Sun Server X4-2			Y				
Sun Server X4-2L			Y				
Sun Server X4-4			Y				
Sun Server X4-8			Y				

■ c – Support starts with Oracle Solaris Cluster 4.1 and Oracle Solaris 11.1 (with card-specific SRU)

Tables of PCIe ExpressModule Ethernet Interfaces for SPARC Servers and x64 Servers

The PCIe ExpressModule Ethernet network interfaces that can be used for Oracle Solaris Cluster networking are listed in the following tables:

TABLE 69   PCIe ExpressModule Ethernet Interfaces for SPARC Servers – ATO and PTO

Servers	Onboard Ethernet Ports	7100477 (PTO), 7100479 (ATO) Sun Quad Port GbEPCIe 2.0 LP Adapter, UTP	7100481 (PTO), 7100482 (ATO) Sun Dual Port GbEPCIe 2.0 LP Adapter, MMF	7100490 (PTO), 7100492 (ATO) Sun Dual Port10GBase-T ExpressModule	7101682 (PTO), 7101681 (ATO) Sun Storage 16 Gb FCExpressModule Universal HBA[a]	7101690 (PTO), 7101689 (ATO) Sun Storage 16 Gb FCExpressModule Universal HBA, Emulex[a]
Netra SPARC T4-1B		Y	Y	Y	Y	
Netra SPARC T5-1B		Y	Y	Y	Y	Y
SPARC T3-4	Y					
SPARC T4-1B		Y	Y	Y	Y	Y
SPARC T4-4	Y	Y	Y	Y	Y	Y
SPARC T5-1B server module		Y	Y	Y	Y	Y

- a – Support starts with Oracle Solaris Cluster 4.1 and Oracle Solaris 11.1 (with card-specified SRU)

The following table covers PCI ExpressModule Ethernet Interfaces of type Sun Storage and StorageTek for SPARC servers.

Note - For Onboard Ethernet ports on SPARC servers, see Table 69, "PCIe ExpressModule Ethernet Interfaces for SPARC Servers – ATO and PTO," on page 157.

TABLE 70   PCIe ExpressModule Ethernet Interfaces for SPARC Servers – Sun Storage and StorageTek

Servers	SG-(X)EMFCOE2-Q-SR Sun Storage 10 GbE FCoEExpressModule CNA, SR Optics[a]	SG-(X)EMFCOE2-Q-TA Sun Storage 10 GbE FCoEExpressModule CNA, Twin-AX[a]	SG-(X)PCIEFCGBE-E8-N StorageTek Dual 8 Gb FCDual GbE ExpressModule HBA, Emulex[a]	SG-(X)PCIEFCGBE-Q8-N StorageTek Dual 8 Gb FCDual GbE ExpressModule HBA, QLogic[a]
Netra SPARC T3-1B			Y	Y
Netra SPARC T4-1B			Y	Y
Netra SPARC T5-1B			Y	Y
SPARC T3-1B	Y	Y	Y	Y
SPARC T3-4	Y	Y	Y	Y
SPARC T4-1B	Y	Y	Y	Y
SPARC T4-4	Y	Y	Y	Y
SPARC T5-1B server module	Y	Y	Y	Y

- a – Support starts with Oracle Solaris Cluster 4.1 and Oracle Solaris 11.1 (with card-specified SRU)

The following table covers PCI ExpressModule Ethernet Interfaces of type Sun Dual, PCIe Dual, and Quad Gigabit for SPARC servers.

Note - For Onboard Ethernet ports on SPARC servers, see Table 69, "PCIe ExpressModule Ethernet Interfaces for SPARC Servers – ATO and PTO," on page 157.

TABLE 71   PCIe ExpressModule Ethernet Interfaces for SPARC Servers – Dual and Quad Gigabit

Servers	(X)1028A-Z Sun Dual 10 GbE XFP PCIe ExpressModule	(X)1110A-Z Sun Dual 10GbE SFP+ PCIe 2.0 ExpressModule	(X)7283A-Z PCIe Dual GbE ExpressModule MMF	(X)7287A-Z Quad GbE UTP x8 PCIe ExpressModule
Netra SPARC T3-1B		Y		
Netra SPARC T4-1B		Y		
SPARC T3-1B		Y	Y	Y
SPARC T3-4		Y	Y	Y

Servers	(X)1028A-Z Sun Dual 10 GbE XFP PCIe ExpressModule	(X)1110A-Z Sun Dual 10GbE SFP+ PCIe 2.0 ExpressModule	(X)7283A-Z PCIe Dual GbE ExpressModule MMF	(X)7287A-Z Quad GbE UTP x8 PCIe ExpressModule
SPARC T4-1B		Y	Y	
SPARC T4-4		Y	Y	Y
SPARC T5-1B server module		Y		
Sun Blade T6300	Y		Y	Y
Sun Blade T6320	Y		Y	Y
Sun Blade T6340	Y		Y	Y

The following tables cover PCI ExpressModule Ethernet Interfaces of type Sun Storage for x64 servers.

TABLE 72   PCIe ExpressModule Ethernet Interfaces for x64 Servers – Sun Storage

Server	7101682 (PTO), 7101673 (ATO) Sun Storage 16 Gb FCExpressModule Universal HBA[a]	7101689 (PTO), 7101690 (ATO) Sun Storage 16 Gb FCExpressModule Universal HBA, Emulex[a]	SG-(X)EMFCOE2-Q-SR Sun Storage 10 GbE FCoEExpressModule CNA, SR Optics[a]	SG-(X)EMFCOE2-Q-TA Sun Storage 10 GbE FCoEExpressModule CNA, SR Twinax[a]
Sun Blade X3-2B			Y	Y
Sun Blade X4-2B	Y	Y		
Sun Blade X6270 M2			Y	Y
Sun Server X2-8			Y	Y

- a – Support starts with Oracle Solaris Cluster 4.1 and Oracle Solaris 11.1 (with card-specific SRU)

The following table covers PCI ExpressModule Ethernet Interfaces of type StorageTek, Sun Dual, and PCIe Dual for x64 servers.

TABLE 73   PCIe ExpressModule Ethernet Interfaces for x64 Servers – StorageTek, Sun Dual, and PCIe Dual

Server	SG-(X)PCIEFCGBE-E8-N StorageTek Dual 8 Gb FCDual GbE ExpressModule HBA, Emulex[a]	SG-(X)PCIEFCGBE-Q8-N StorageTek Dual 8 Gb FCDual GbE ExpressModule HBA, QLogic[a]	(X)1028A-Z Sun Dual 10 GbE XFP PCIe ExpressModule	(X)7282A-Z PCIe Dual GbE ExpressModule UTP
Netra Blade X3-2B	Y	Y		
Sun Blade X3-2B	Y	Y		

Server	SG-(X)PCIEFCGBE-E8-N StorageTek Dual 8 Gb FCDual GbE ExpressModule HBA, Emulex[a]	SG-(X)PCIEFCGBE-Q8-N StorageTek Dual 8 Gb FCDual GbE ExpressModule HBA, QLogic[a]	(X)1028A-Z Sun Dual 10 GbE XFP PCIe ExpressModule	(X)7282A-Z PCIe Dual GbE ExpressModule UTP
Sun Blade X4-2B	Y	Y		
Sun Blade X6220			Y	Y
Sun Blade X6240			Y	Y
Sun Blade X6250				Y
Sun Blade X6270			Y	Y
Sun Blade X6270 M2	Y	Y		
Sun Blade X6440			Y	Y
Sun Blade X6450			Y	Y
Sun Fire X4800	Y	Y		
Sun Netra X6270 M2	Y	Y		
Sun Server X2-8	Y	Y		

- a – Support starts with Oracle Solaris Cluster 4.1 and Oracle Solaris 11.1 (with card-specific SRU)

Tables of NEM and XAUI Interfaces for Oracle Solaris Servers

The Network Express Module (NEM) network interfaces and XAUI Ethernet interfaces that can be used for Oracle Solaris Cluster networking are listed in the following tables:

TABLE 74   Network Express Module (NEM) Ethernet Interfaces for SPARC Servers

Server	(X)4250A, 7105397 (PTO) SB 600010-Port GbE NEM
Netra SPARC T3-1B	Y
Netra SPARC T4-1B	Y
SPARC T3-1B	Y

Server	(X)4250A, 7105397 (PTO) SB 600010-Port GbE NEM
SPARC T4-1B	Y
Sun Blade T6300	Y
Sun Blade T6320	Y
Sun Blade T6340	Y

TABLE 75   Network Express Module (NEM) Ethernet Interfaces for x64 Servers

Server	(X)4250A, 7105397 (PTO) SB 600010-Port GbE NEM	(X)8598A NEM2
Netra Blade X3-2B	Y	
Sun Blade X3-2B	Y	
Sun Blade X4-2B	Y	
Sun Blade X6220	Y	
Sun Blade X6240	Y	
Sun Blade X6250	Y	
Sun Blade X6270	Y	
Sun Blade X6270 M2	Y	
Sun Blade X6440	Y	
Sun Blade X6450	Y	
Sun Fire X4800		Y
Sun Netra X6270 M2	Y	
Sun Server X2-8		Y

The XAUI network interfaces that can be used for Oracle Solaris Cluster networking are in the following table.

TABLE 76   XAUI Ethernet Interfaces for SPARC Servers

Server	10GbE QSFP Rear I/O Module[a]	SE3X7XA1Z / SE3Y7XA1Z	SE4X5XC1Z / SE4Y5XC1Z[b]	SESX7XA1Z / SESY7XA1Z
Netra SPARC T3-1				Y
Netra SPARC T4-1				Y
SPARC T3-1		Y		
SPARC T3-2			Y	
SPARC T3-4	Y			
SPARC T4-1		Y		
SPARC T4-2			Y	
SPARC T4-4	Y			
Sun Netra T5220				Y

Server	10GbE QSFP Rear I/O Module[a]	SE3X7XA1Z / SE3Y7XA1Z	SE4X5XC1Z / SE4Y5XC1Z[b]	SESX7XA1Z / SESY7XA1Z
Sun Netra T5440				Y
Sun SPARC Enterprise T5120				Y
Sun SPARC Enterprise T5140				Y
Sun SPARC Enterprise T5220				Y
Sun SPARC Enterprise T5240				Y
Sun SPARC Enterprise T5440				Y

- a – Support starts with Oracle Solaris 11 SRU 2 and Oracle Solaris Cluster 4.0 SRU 1
- b – Support starts with Oracle Solaris 11 SRU 2 and Oracle Solaris Cluster 4.0 SRU 1

InfiniBand Support

InfiniBand is supported with IP and Ethernet.

- InfiniBand is supported with Internet Protocol over InfiniBand (IPoIB) for both cluster interconnect and public networking.
- InfiniBand is also supported with Ethernet over InfiniBand (EoIB) for public networking. EoIB uses the Sun Network QDR InfiniBand Gateway Switch (X2826A-Z) based VNICs.

Note - You must create separate InfiniBand partitions on the InfiniBand switches for public networks and for both private cluster networks. So, you need two separate partitions for the two cluster interconnects, and one partition for the public network, if you use a public network.

InfiniBand host channel adapters (HCAs) are cabled to InfiniBand switches. Directly cabling HCAs between two cluster nodes is not supported.

The PCIe InfiniBand HCAs that can be used for Oracle Solaris Cluster networking are listed in the following two tables.

TABLE 77   PCIe InfiniBand Interfaces for SPARC Servers

Server	7104074 (PTO), 7104073 (ATO) Oracle Dual Port QDR InfiniBand Adapter M3[a]	(X)4242A Sun IB Dual Port 4x QDR PCIe LP HCA M2
Fujitsu M10-1, Fujitsu M10-4, Fujitsu M10-4S	Y	Y

Server	7104074 (PTO), 7104073 (ATO) Oracle Dual Port QDR InfiniBand Adapter M3[a]	(X)4242A Sun IB Dual Port 4x QDR PCIe LP HCA M2
M8-8	Y	
T8-1, T8-2, T8-4	Y	
Netra SPARC T4-2		Y
SPARC Enterprise M3000		Y
SPARC Enterprise M4000		Y
SPARC Enterprise M5000		Y
SPARC Enterprise M9000		Y
SPARC M5-32, SPARC M6-32	Y	Y
SPARC M7-8, SPARC M7-16	Y	
SPARC S7-2 server, SPARC S7-2L server	Y	
SPARC T3-1, SPARC T3-2		Y
SPARC T4-1, SPARC T4-2	Y	Y
SPARC T5-2, SPARC T5-4, SPARC T5-8	Y	Y
SPARC T7-1, SPARC T7-2. SPARC T7-4	Y	

- a – Support starts with Oracle Solaris Cluster.1 SRU 3, Oracle Solaris 11.1 SRU 9

The PCIe ExpressModule InfiniBand HCAs that can be used for Oracle Solaris Cluster networking are listed in the following table.

TABLE 78   PCIe ExpressModule InfiniBand Interfaces for SPARC Servers

Server	(X)4243A-Z Dual Port 4x QDR IB PCIe ExpressModule HCA M2
SPARC T3-1B, SPARC T3-4	Y
SPARC T3-4	Y
SPARC T4-1B, SPARC T4-4, SPARC T5-1B	Y

Network Cables and Switches on Oracle Solaris Cluster

Public networking follows standard support as specified by the network adapter.

Cables and switches supported with each type of cluster interconnect are listed in the following tables:

TABLE 79   Cables for Cluster Interconnect

Network Interface	Cable	Part # for cable
Fast Ethernet	Null Ethernet Cable (for point-to-point only)	3837A
	Customer-supplied (for junction based or point to point)	
Gigabit Ethernet	Customer-supplied (for junction based or point to point)	
10 Gigabit Ethernet	Customer Supplied (for junction based or point to point)	
InfiniBand	As supported by the Oracle IB HCA and Switches	

TABLE 80   Switches for Cluster Interconnect

Network Interface	Switch	Part # of Switch
Fast Ethernet	Customer supplied	N/A
Gigabit Ethernet	Customer supplied	N/A
10 Gigabit Ethernet	Customer supplied	N/A
InfiniBand	Voltaire ISR 9024 with Gridvision 5.1	Voltaire is a Oracle Solaris Ready Partner
	Oracle IB Switches as supported by the IB HCA	

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Oracle Virtual Networking on Oracle Solaris Cluster

Oracle Virtual Networking (OVN) family of products provides another way to establish network and storage connectivity in the Oracle Solaris Cluster environment:

- OVN vNICs can be used for constructing the cluster interconnect, and as public network interfaces.

  OVN vNICs can also be used to connect supported iSCSI and NFS storage as cluster shared storage.

- OVN vHBAs can be used to connect to supported Fibre Channel connected shared storage.

- The private virtual interface (PVI) VNIC functionality of Oracle SDN can be used for the cluster interconnect or public network. PVI is supported starting with Oracle Solaris Cluster 4.3 SRU 3.

- Clusters of Oracle VM Server for SPARC guest domains as cluster nodes is supported.

  These guest domains must use vnet and vdisk devices exported from service domains (single or redundant), backed by OVN vNIC (on Ethernet and PVI) and OVN vHBA. This guest-domain configuration is supported starting with Oracle Solaris Cluster 4.3 SRU 3.

Oracle Virtual Networking Configuration on Oracle Solaris Cluster

- Oracle Solaris Cluster 4.3 (and SRUs)
  - Oracle Solaris 11.3 (and SRUs)
  - Oracle Virtual Networking Host Drivers bundled with Oracle Solaris 11.3 (and SRUs)
- Oracle Solaris Cluster 4.1 SRU 6 (and later SRUs)
- Oracle Solaris 11.1 SRU 17 (and later SRUs)
- Oracle Virtual Networking Host Drivers for Oracle Solaris 11.1, starting with release 5.3.5

Servers That Support Oracle Virtual Networking on Oracle Solaris Cluster

TABLE 81   SPARC Servers That Support Oracle Virtual Networking

Servers	Notes
Fujitsu M10-1	
Fujitsu M10-4	
Fujitsu M10-4S	
Fujitsu SPARC M12-1 Fujitsu SPARC M12-2 Fujitsu SPARC M12-2S	Starting with: ■ Oracle Solaris Cluster 4.1 with SRU 4.1.8 and later ■ Oracle Solaris Cluster 4.2 with SRU 4.2.5.1.0 and later ■ Oracle Solaris Cluster 4.3 and later SRUs Starting with: ■ Oracle Solaris 11.1 with SRU 11.1.21.4.1 and later ■ Oracle Solaris 11.2 with SRU 11.2.15.5.1 and later ■ Oracle Solaris 11.3 and later SRUs
SPARC M5-32 server	
SPARC M6-32 server	
SPARC M7-8 server	Starting with Oracle Solaris Cluster 4.3
SPARC M7-16 server	Starting with Oracle Solaris Cluster 4.3
SPARC T4-1 server	
SPARC T4-4 server	
SPARC T5-2 server	
SPARC T5-4 server	
SPARC T5-8 server	
SPARC T7-1 server	Starting with Oracle Solaris Cluster 4.3
SPARC T7-2 server	Starting with Oracle Solaris Cluster 4.3
SPARC T7-4 server	Starting with Oracle Solaris Cluster 4.3

Supported Storage for Oracle Virtual Networking

Oracle Storage Connected by Fibre Channel

■ Oracle FS1-2 Flash Storage System – Starting with Oracle Solaris Cluster 4.3 OVN support

- Oracle ZFS Storage Appliance – ZS3 series

  See also "Oracle FS1-2 Flash Storage System for FC Storage" on page 131.
- Pillar Axiom 600

  See also "Pillar Axiom 600 for FC Storage" on page 135.
- Sun ZFS Storage Appliance – 7000 series

  See also "Oracle ZFS Storage Appliance on Ethernet Requirements" on page 139.

Oracle Storage Connected by iSCSI or NFS

- Oracle ZFS Storage Appliance – ZS3 series
- Sun ZFS Storage Appliance – 7000 series

See "Oracle ZFS Storage Appliance on Ethernet Requirements" on page 139 for additional information.

Supported Oracle Fabric Interconnect Chassis

- Oracle Fabric Interconnect F1-4
- Oracle Fabric Interconnect F1-15

Supported InfiniBand Host Channel Adapters for Oracle Virtual Networking

- Oracle Dual Port QDR InfiniBand Adapter M3 – 7104074 (PTO), 7104073 (ATO)
- Sun InfiniBand Dual Port 4x QDR PCIe Low Profile Host Channel Adapter M2 - X4242A (PTO), 4242A (ATO)

Additional Information About Oracle Virtual Networking

For installation and configuration information, see Oracle Solaris Cluster 4.x Setup Requirements/Restrictions for Oracle Virtual Networking (OVN) (Doc ID 1684070.1) in My Oracle Support.

Oracle Virtual Networking Host Drivers for Oracle Solaris 11.1 and Oracle Solaris 11.3 support only IPv4.