

Oracle Solaris Cluster for SAP Configuration Guide

Solaris Cluster 3.3 3/13 and 4.x

ORACLE WHITE PAPER | MAY 2016

SAP® Certified
Integration with SAP NetWeaver®





Disclaimer

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decisions. The development, release, and timing of any features or functionality described for Oracle's products remains at the sole discretion of Oracle.



ORACLE®



Table of Contents

Disclaimer	1
1. Introduction	2
2. Oracle Solaris Cluster Framework and Data Services	3
3. SAP Scenarios	4
4. Oracle Solaris Cluster Geographic Edition	5
5. Licensing Information	5
6. References	5



1. Introduction

The global economy offers unprecedented opportunity for companies to increase customers and revenue, but there is a downside from an IT point of view. Systems must be continuously available. The Oracle Solaris operating system includes features such as predictive self healing and fault manager that are designed to keep system and applications up and running, even if there is a hardware failure. Oracle Solaris Cluster software protects against system failure for even higher availability. In the SAP environment, high availability (HA) is very important as most SAP products are business critical and must stay always up and running. This configuration guide is intended to help identify the Oracle Solaris Cluster Data Service for SAP products that provide high availability for common SAP implementation scenarios.

Oracle Solaris Cluster is a high availability cluster software product for the Oracle Solaris operating system. It is used to improve the availability of hardware and software services, by having redundant computers (known as cluster nodes), the Solaris Cluster framework software, and cluster data services (known as agents) for the applications to provide high availability. Applications are administrated and monitored in resource groups which consist of one or more resources. Resource groups can be configured as fail over, scalable, or multiple masters, depending on the application requirements.

Oracle Solaris Cluster provides extended support for Oracle Solaris Zones, enabling server consolidation in HA environment. These virtualization capabilities allow scalable, multiple masters or failover applications and associated Oracle Solaris Cluster data services to run unmodified within zone clusters. Zone clusters on Oracle Solaris Cluster provide administrative isolation with full service protection through fine-grained monitoring of applications, policy-based restart, and fail over within a virtual cluster. This type of environment offers multiple layers of availability. For example, a failed application can be configured to first try to restart in its zone. If the restart fails, it can attempt to start in another zone using Oracle Solaris Cluster failover capability. If this fails again, it can attempt to reboot the zone using Oracle Solaris Cluster framework and start the application after the zone is rebooted.


The Oracle Solaris Cluster Geographic Edition provides Disaster Recovery feature. For more information see chapter 4.

2. Oracle Solaris Cluster Framework and Data Services

Oracle Solaris Cluster Framework and Data Services can be used to improve the availability of SAP components running on Oracle Solaris operating system. It eliminates every single point of failure (SPOF) in the system. All tiers of a SAP system can be consolidated within a Oracle Solaris cluster environment, enabling a single point of management with data services for database instance(s), Standalone Central Service instance(s), Enqueue Replication server instance(s), Primary and Additional Application Server instance(s), and liveCache instance(s). The earlier SAP version with Central Instance is also supported on Solaris Cluster.

The following is a list of useful Solaris Cluster Data Services in SAP environments:

- » **Oracle Solaris Cluster Data Service for SAP NetWeaver** – This agent supports SAP Standalone Central Services instance(s), Enqueue Replication server instance(s), Primary and Additional Application Server instance(s), and earlier SAP versions with Central Instance. The Additional Application Server instances can be configured as multiple master resources, which may run on multiple cluster nodes at the same time, or as failover resources which run on one node only. All other instances are to be configured as failover resources.
- » **Oracle Solaris Cluster Data Service for Oracle Database** - This agent supports Oracle database single instance configuration. The Oracle database runs on one node and can fail over to other nodes.
- » **Oracle Solaris Cluster Data Service for Oracle Real Application Clusters** – This agent supports the Oracle RAC database, which may run on multiple cluster nodes simultaneously.
- » **Oracle Solaris Cluster Data Service for Oracle External Proxy** – This agent is used for interrogating the status of Oracle Database or the Oracle RAC database that is not on the same cluster as the SAP application, but on an external cluster.
- » **Oracle Solaris Cluster Data Service for SAP MaxDB** – It consists of two agents, one for the MaxDB database, and the other for the xserver processes. The MaxDB database is to be configured in restart and failover mode. The xserver processes are responsible for all connections to the MaxDB database. The xserver resource must be configured in multiple-master mode and runs on each of the cluster nodes that MaxDB database might failover to.
- » **Oracle Solaris Cluster Data Service for SAP liveCache** – It consists of two agents, liveCache and xserver. The liveCache agent is responsible for making the SAP liveCache database highly available in restart and failover mode. The xserver agent takes care of the health of the xserver processes, which establish all connections to the SAP liveCache. It must be configured in multiple-master mode and runs on each of the cluster nodes that liveCache may failover to.

- 
- » **Oracle Solaris Cluster Data Service for Sybase ASE** – This agent supports the Sybase database in restart and failover mode.
 - » **Oracle Solaris Cluster Data Service for NFS** – This agent can be used for sharing SAP central directories via NFS.
 - » **Oracle Solaris Cluster Data Service for Oracle Solaris Zones** – This agent supports HA for Solaris Zones. The zone with its application can be switched over from one cluster node to another. Please note this is not the same as Oracle Solaris Zone Cluster.

The Solaris Cluster Data Service for SAP NetWeaver can be integrated with *sapstartsrv* via *SAP HA Connector* and is **certified by SAP** with SAP HA Interface Certification NW-HA-CLU740. This agent is currently available on two Solaris Cluster versions:

- » Oracle Solaris Cluster 4.x for Solaris 11.x operating systems
- » Oracle Solaris Cluster 3.3 3/13 for Solaris 10 operating systems


For more information about Oracle Solaris Cluster framework and data services, please refer to the [Oracle Solaris Cluster 4.3 documentation](#) and [Oracle IT Infrastructure Solutions for SAP High Availability](#).

3. SAP Scenarios

Oracle Solaris Cluster support all the SAP products based on SAP NetWeaver 7.0x and 7.x with SAP kernel version updated to 720/720_EXT, 721/721_EXT, 722/722_EXT, 740, 741, 742, and 745.

Historically, there are three installation scenarios for HA SAP system. For new SAP system installation, it is highly recommended to configure with Central Services (ASCS/SCS/ERS) scenario.

- » **Standalone Central Services (ASCS/SCS/ERS) scenario** – This is the default High-Availability SAP system installation with *sapinst*, include ABAP, Java and ABAP+Java system. The Single Point of Failure of this scenario is the ASCS/SCS instance(s), which consist of the Message Server and Enqueue Server processes. The Enqueue Server process holds the enqueue lock table in shared memory. The ERS instance(s) holds the Enqueue Replication Server process, which replicates the enqueue lock table on another cluster node. The (A)SCS and ERS instance(s) must be configured in failover resource group(s). In case of failure, the (A)SCS instance must failover to the node where the ERS instance is running and takes over the replicated enqueue lock table, thus to prevent enqueue data loss. The ERS instance will be switched over by the Solaris Cluster agent automatically to another available cluster node to re establish the redundancy of the enqueue lock table. The Primary Application Server instance may also hold some unique services making it a



Single Point of Failure as well. It can be protected in a failover resource group. One or more Additional Application Server instance(s) can be configured in failover mode or multiple master resource groups. In multiple master resource groups, the Solaris Cluster agent takes care for all the given number of application server instances. If one of the application server instances fails, it may start another one to keep the capacity the same as before.

- » **ABAP Central Instance Scenario** - This is the legacy SAP system architecture. Only earlier versions of ABAP-only SAP systems may have this scenario. The Single Point of Failure in this scenario is the Central Instance which holds the Message Server and the Enqueue Server together with the Primary Application Server in one instance. Dialog Instances or Additional Application Server instances can be configured in failover or multiple master resource groups as well. Since this will be not supported on SAP NetWeaver 7.5, it is recommended to migrate to the (A)SCS/ERS scenario as soon as possible. For migration please refer to the SAP note 2271095.
- » **ABAP Central Instance + Java Central Services Scenario** – Only the ABAP+Java SAP system based on NetWeaver 2004 with SAP kernel 640 can have this scenario. Since this is only in customer specific support by SAP, it is highly recommended to move from this scenario to the (A)SCS/ERS scenario as soon as possible. For migration please refer to the white paper [Migration to Solaris Cluster Data Service for SAP NetWeaver](#).

4. Oracle Solaris Cluster Geographic Edition

The Oracle Solaris Cluster Geographic Edition extends the Oracle Solaris Cluster by using multiple clusters in separated locations, especially long distances, to provide service continuity in case of disaster in one location. For more information, please refer to [Oracle Solaris Cluster 4.3 Geographic Edition Overview](#).

5. Licensing Information

For Ordering and Licensing questions, please refer to [Oracle Solaris Cluster 4.3 Licensing Information User Manual](#).

6. References

For more information about HA SAP on Oracle Solaris Cluster, please refer to the [Oracle Solaris Cluster 4.3 documentation](#) and [Oracle IT Infrastructure Solutions for SAP High Availability](#).







Oracle Corporation, World Headquarters

500 Oracle Parkway
Redwood Shores, CA 94065, USA

Worldwide Inquiries

Phone: +1.650.506.7000
Fax: +1.650.506.7200

CONNECT WITH US

-  blogs.oracle.com/oracle
-  facebook.com/oracle
-  twitter.com/oracle
-  oracle.com

Integrated Cloud Applications & Platform Services

Copyright © 2016, Oracle and/or its affiliates. All rights reserved. This document is provided for information purposes only, and the contents hereof are subject to change without notice. This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document, and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.

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

Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. UNIX is a registered trademark of The Open Group. 0116

White Paper Title
January 2016
Author: [OPTIONAL]
Contributing Authors: [OPTIONAL]

