

Using SAP NetWeaver with Oracle Database Appliance Software 12.1.2.6.0

Key Guidelines

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Disclaimer

Oracle Database Appliance Software 12.1.2.6.0 on Oracle Database Appliance X5-2 models do not support 11.2 databases for SAP environments due to some constraints. Please note earlier versions of Oracle Database Appliance models are unaffected and this disclaimer is solely applicable to X5-2 models only.

Oracle MOS Note 888888.1 dictates that databases on Oracle Database Appliance Software 12.1.2.6.0 on X5-2 models have to run on ACFS; however SAP and Oracle Database Appliance engineering worked together and do support Oracle databases for SAP on classic ASM diskgroup layouts.

Introduction

This document explains all the necessary steps to setup an SAP system using an Oracle Database Appliance Software 12.1.2.6.0 and later.

Note: This paper is for Oracle Database Appliance Software 12.1.2.6.0 and later releases.

All SAP products and solutions based on SAP NetWeaver Technology using a minimum SAP NetWeaver Version 7.0 are both certified and supported to be used with the Oracle Database Appliance. As an excerpt from SAP Note 2133079, SAP products such as SAP ERP 6.0, SAP BW 7.0 and later, SAP CRM 7.0, SAP SRM 7.0, SAP SCM 7.0 or SAP solutions such as SAP Banking Services version 6.0 and later can be used with the Oracle Database Appliance. Additional SAP products like:

- » SAP NetWeaver MDM 7.1 SP12 and later
- » Reporting Data Source of SAP Business Objects BI 4.0 (minimum SP10) and BI 4.1 (minimum SP04)
- » Repository, source and target databases for SAP Data Services 4.2 (minimum SP 03)

can also be used with the Oracle Database Appliance.

The Oracle Database Appliance Software provides the following capabilities to an SAP environment:

- » Highly available active-active clustered database server for SAP Applications
- » Complete clustering solution for SAP High Availability Resources such as Application Server Central Services for both ABAP and JAVA stack (ASCS, SCS)
- » Highly available file server for SAP required shared file systems such as /sapmnt and /usr/sap/trans.

The Oracle Database Appliance Software cannot be used to run SAP application instances. SAP application instances have to run on separate hosts and connect via network against the database(s) on the Oracle Database Appliance. In SAP terminology this is called a three tier architecture. This flexible three tier architecture allows any supported combination of hardware and operating systems running the SAP instances to be used with the Oracle Database Appliance, e.g. we can run or keep existing SAP Application servers on any supported platform connected to the Oracle Database Appliance. This flexibility allows an easy introduction of the Oracle Database Appliance in existing SAP environments as the SAP application layer remains unchanged.

The only SAP components which are supported to run on the Oracle Database Appliance Software are the SAP database administration tools (BR*Tools), SAP Application Server Central Services (ASCS, SCS), the SAP Enqueue Replication Server (ERS) and various SAP agents. This paper describes the SAP specific deployment and configuration on the Oracle Database Appliance with the Oracle components and their versions, SAP specific database requirements, information on how to install SAP required database patches for the Oracle Database Appliance Software and suggestions for the implementation of shared file systems for SAP installations.

Whilst both bare and virtualized deployments are possible on the Oracle Database Appliance this document illustrates the bare metal deployment as the virtualized deployment is not certified in an SAP environment.

| Oracle Database Appliance version | OS release | End User Bundle version | Grid Infrastructure version | Database version |
|--------------------------------------------|------------------|----------------------------|-----------------------------|--------------------------------------------------------------------------|
| 12.1.2.6.0 | Oracle Linux 6.7 | 12.1.2.6.0 | 12.1.2.0.2+ | 12.1.2.0.2+ RAC 12.1.2.0.2+ Single Instance |
| 12.1.2.6.0 | Oracle Linux 6.7 | 12.1.2.6.0 | 12.1.2.0.2+ | 11.2.0.4.x+ RAC* 11.2.0.4.x+ Single Instance* * Not on X5-2 models |

Please check the respective whitepaper on SCN for earlier versions of the Oracle Database Appliance.

When using SAP applications with the Oracle Database Appliance you can run Oracle Real Application Clusters 12c or 11gR2, or, Oracle Database 12c or 11gR2. Oracle Real Application Clusters One Node is not supported with SAP products and therefore cannot be used.

SAP Note 2290084 will be updated on a regular basis to reflect any changes on using SAP Applications with the Oracle Database Appliance.

Overall this document complements the existing Oracle Database Appliance documentation [1] and therefore it is assumed that the reader is familiar with the Oracle Database Appliance documentation.

To understand the requirements and steps outlined in this document it is necessary that the reader is also familiar with the SAP specific support notes and white papers on Oracle RAC [2] and Oracle ASM and HA capabilities [3].

SAP support notes [4] are available from the SAP Service Marketplace for authorized users.

Mixed Grid Infrastructure and RDBMS Versions

Starting with Grid Infrastructure (GI) version 12.1.0.2 it is now supported to run a certain mix of GI and RDBMS for SAP databases. With GI 12.1.0.2 Oracle supports to run RDBMS 11.2.0.4 and/or RDBMS 12.1.0.2 for SAP databases. Detailed information is being provided in SAP Notes 1677978 and 527843. Please remember the constraint for X5-2 models.

Oracle Database Appliance Software Installation Overview

To set up your Oracle Database Appliance Software for an SAP database, we follow below major steps:

1. Re-image the Oracle Database Appliance if needed

If the Oracle Database Appliance is delivered with a factory image of version less than 12.1.2.6.0, one has to reimage the Oracle Database Appliance with the OS ISO Image 12.1.2.6.0 or later. Download the ISO image following the links in Oracle Support Note 888888.1 and install it according to the instructions in the Oracle Database Appliance documentation.

2. Install the Oracle Database Appliance Bundle Patch

Install the Oracle Database Appliance Bundle Patch corresponding to the Oracle Database Appliance ISO image you installed in the first step (12.1.2.6.0 or later). It is recommended to install the Oracle Database Appliance Bundle Patch even after re-imaging the Oracle Database Appliance with an ISO image in Step 1 as the Oracle Database Appliance Bundle Patch may contain firmware patches that are not installed by the ISO image. Download the Oracle Database Appliance Bundle Patabase Appliance Bundle Patch following the links in Oracle Support Note 888888.1 and install it according to the instructions in the Oracle Database Application documentation.

3. Install and deploy the Oracle Database Appliance End User Bundle

Install the Oracle Database Appliance End User Bundle corresponding to your Oracle Database Appliance version and start the database deployment. Download the Oracle Database Appliance End User Bundle following the links in Oracle Support Note 888888.1. Install and deploy the end user bundle according to the instructions in section "Oracle Database Appliance for SAP Deployment" of this white paper.

4. Rollback DB PSU

This step aims for a faster installation of the SAPDBBundlePatch later on. Please follow chapter "Rolling back initial DB PSU".

5. Use SWPM to prepare the Oracle Database Appliance for an SAP database

Run the SAP Software Provisioning Manager (SWPM) as described in section "SAP Software Provisioning Manager on Oracle Database Appliance" of this white paper to create SAP-specific OS users, create SAP-specific directories, and other preparations of the Oracle Database Appliance for an SAP database.

6. ASCS Instance installation

Before moving on creating a database instance SAP requires to have an Application Server ABAP Central Services instance. We perform this installation in high availability mode. Follow chapter "SWPM: ASCS Instance installation"

7. Create an SAP database instance

Run SWPM as described in section "Using SWPM on the Oracle Database Appliance" to create a new SAP database instance. This database instance will use the Oracle database software deployed by the Oracle Database Appliance End User Bundle in Step 3.

8. Install the latest SAP Bundle Patch for the Oracle Database Appliance

It is required that any database instance has the latest SAP-recommended Oracle Grid Infrastructure and database patches installed. Download the latest SAP Bundle Patch for the Oracle Database Appliance following the instructions in SAP Note 2145651 and install it according to the instructions in section "Installation of the SAP Bundle Patch for ODA" of this white paper.

9. Post installation considerations.

ASM Disk Groups for SAP Databases

The default ASM Disk Groups provided by the Oracle Database Appliance should be used for all SAP databases. For SAP production databases a redundancy level of high should be used to achieve the highest level of protection against any type of storage failure. Other SAP databases used for development, test and QA may use a normal ASM redundancy level.

In line with the standard Oracle Database Appliance setup you should use the ASM disk Groups "+DATA", "+REDO" and "+RECO". The DATA Group should contain all data files, control files, spfiles, OCR and voting disks. The RECO Group should contain temporary files, archive logs, flashback files, backups and a mirrored controlfile copy. The REDO Group should contain all non-multiplexed redo log files.

When storing more than one SAP database (e.g. SAP ERP database and SAP BW database or, SAP ERP database with an SAP CRM database or, multiple SAP ERP databases) on the Oracle Database Appliance all files of each of these SAP databases should follow the above recommendation and all be stored in the DATA, REDO and RECO disk groups.

For performance and throughput reasons it is recommended for each SAP database to have two control files, one in the DATA disk group and the other in the RECO disk group. Non-multiplexed online redo log files shall be stored in the REDO disk group. The REDO disk group is formed entirely by SSDs. Standard SAP installations use three control files in the database, thus it can be suggested to remove one control file from the spfile or init.ora. Standard SAP installations also create two members for each online redo log file. On the Oracle Database Appliance it is therefore possible to remove one member of each online redo log file for each redo thread. Three control files and multiplexed online redo log files are not needed on the Oracle Database Appliance as the control files and the online redo log files are stored in the DATA, RECO and REDO disk groups which already provide triple mirroring for each file at the Oracle ASM level due to the redundancy level of high.

Clustering Solution for SAP HA on Oracle Database Appliance

If you plan to implement SAP High Availability Resources such as Central Services for the SAP ABAP stack(ASCS, ERS), SAP JAVA stack(SCS, ERS) and/or SAP WebDispatcher SAPCTL is the tool of choice.

A detailed guide how to implement ASCS and ERS on Oracle Database Appliance is provided in SAP Note 1877857 at install time. Once installed this requires configuration against Oracle CRS using SAPCTL. Consult SAP Note 1496927 for download and guidance on SAPCTL. This document takes care of implementing ASCS + ERS high availability using SAPCTL.

SAP NetWeaver Products on the Oracle Database Appliance

SAP NetWeaver integration points are split between the parts that are certified to run on the Oracle Database appliance itself on one hand, and on other hand for those hosts that form the SAP application servers. Consequently we have to choose a certification that satisfies both database and host operation system requirements, which is SAP NetWeaver 7.41 (or higher) 64-bit Unicode.

Non-local software deployments need to run SAP Kernel Release 7.21 EXT or higher.

SAP NetWeaver products will be delivered with SAP Kernel Release 7.21 EXT and higher or with SAP NetWeaver 7.0 and higher. More related information can be found in SAP Notes 2290084, 1760737 and 1973403. Information leading entity is the SAP Product Availability Matrix, SAP PAM.

Character Set Requirements for SAP Databases

Fresh installations of SAP NetWeaver 7.x systems or higher provide Unicode support only. For an SAP Unicode installation it is required that both the character set and the national character set in the database is set to UTF8. SAP SWPM will take care about the character set and automatically choose the right one. With the current Oracle Database Appliance version one can decide whether a default database should be created or not. For SAP the recommendation is <u>not</u> to create a default database and bypass the step "Database Information".

Non-Unicode SAP Installations

Existing non-Unicode SAP installations can be used with the Oracle Database Appliance. It is required for these non-Unicode installations that the character and national character set of the migrated databases from existing systems to the Oracle Database Appliance remain as in the original system.

It is mandatory that the SAP application of such a non-Unicode SAP installation runs on an operating system which supports the non-Unicode runtime requirements of SAP. The Product Availability Matrix (PAM) of SAP (http://www.service.sap.com/PAM) should be checked for valid operating system support for non-Unicode SAP installations.

In the case of non-Unicode installations it is highly recommended not to change the hardware nor operating system for the SAP application layer. Only the existing database server and storage layer should be changed to the Oracle Database Appliance.

Note: In the case of non-Unicode SAP installations you cannot run the SAP Central Services on the Oracle Database Appliance.

Shared File Systems in SAP Environments

In an SAP environment it is common that all SAP Application Servers have access to a shared file system (/sapmnt, /usr/sap/trans, ..) which stores the SAP kernels, profiles, trace files and provide the global SAP transport directory. Typical SAP installations implement such a shared file system using a NAS appliance, a cluster file system or via an NFS exported file system from the database server. Highest availability can be achieved via a cluster file system or, the NFS sourcing location is protected by special configurations like HA-NFS in order to avoid a single point of failure within the SAP environment.

If you already run an existing shared file system solution in your SAP environment <u>not</u> using an NFS exported file system from the database server it is recommended to keep this solution when moving to the Oracle Database Appliance.

The deployment phase of the Oracle Database Appliance offers the creation and configuration of a Cloud File System. This file system is based on Oracle's Advanced Cluster File System (ACFS) and can be used for /sapmnt on all application servers, if it is getting NFS exported from the database server. Post-deployment one can add additional file systems like /usr/sap/trans and others using the Advanced Storage Management Configuration Assistant (asmca).

In case of Oracle DataGuard deployments – and topographic switchover or failover scenarios ACFS based filesystems won't fail over.

Oracle Database Appliance Node as an NFS Server

This is best described in Oracle MOS Note:1934030.1 ODA (Oracle Database Appliance): HowTo export ACFS (cloudfs) using HANFS.

Oracle Database Appliance Node as an NFS Client

This scenario is applicable to environments where /sapmnt is being consumed from a 3rd party and not part of the Oracle Database Appliance setup. We demonstrate here the nfs mount exported from sapstore to the local mountpoint /path/to/mountpoint.

Ensure that required packages are around, if not, install them.

[root@lsoda01]# rpm -qa | grep "nfs\|rpcbind"
rpcbind-0.2.0-11.el6.x86_64
nfs-utils-1.2.3-54.el6.x86_64
nfs-utils-lib-1.1.5-9.el6.x86_64

Create local mountpoint, check/start rpc service, mount, verify:

[root@lsoda01]# mkdir -p /path/to/mountpoint [root@lsoda01]# chmod 755 /path/to/mountpoint [root@lsoda01]# showmount -e sapstore Export list for sapstore: /export/Oracle_Data (everyone) /export/Oracle_Home (everyone) [root@lsoda01]# service rpcbind status ; service rpcbind start Starting rpcbind: [OK] [root@lsoda01]# mount sapstore:/export/Oracle_Home /path/to/mountpoint [root@lsoda01]# mount

••

sapstore:/export/Oracle_Home on /path/to/mountpoint type nfs
(rw,vers=4,addr=10.17.30.74,clientaddr=10.20.91.105)

Oracle Database Appliance Software for SAP Deployment

This section describes the deployment of the Oracle Database Appliance Software End User Bundle for SAP. The deployment typically installs the Oracle Grid and RDBMS software and creates an Oracle Grid instance and an Oracle database. With Oracle Database Appliance Software version 12.1.2.6.0 we bypass the create database step, we deploy the RDBMS software only.

The deployment consists of two major pieces. The first piece is the pre-installation part, where all necessary customer specific parameters are collected and stored into a configuration file. The second part of the installation uses the information from the freshly created configuration file and kicks off 24 automated installation steps.

Before you start the deployment of the Oracle Database Appliance end user bundle ensure that you have the latest Oracle Database Appliance Bundle Patch installed. Review above section "Oracle Database Appliance Installation Overview" for more details. OAKEndUserBundle* files come as different file names when downloaded from MOS.

The next pages show a step by step deployment. We're using the -advance switch for "oakcli deploy".

Login as user root on the first node

- » cd /tmp ; mv /path/to/OAKEndUserBundle_*of2.zip /tmp
- » oakcli unpack -package /tmp/OAKEndUserBundle_lof2.zip
- » oakcli unpack -package /tmp/OAKEndUserBundle_2of2.zip

Repeat above commands on the second node.

When finished run following command on the first node: /opt/oracle/oak/bin/oakcli deploy -advance

| 🛃 👩 Oracle Appliance | Manager : 12.1.2.6.0 <@oak1> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Welcome | |
| Welcome Configuration Type User Group Informati System Information Network Information Database Information Summary Install progress Complete | Welcome to Oracle Appliance Manager Provide information about your system name and configuration in the following screens, and save the parameter file so that you can use it as a guide for network and configuration. If you are ready to install, then you can load a previously created configuration file. You can also modify a configuration file that you have created earlier, or enter completely new information. Click Install to deploy Oracle Grid Infrastructure and Oracle Database with the configuration information you have provided. |
| <mark>▲ →</mark> | Copyright © 2011, Oracle and/or its affiliates. All rights reserved < Back Next > Install Cancel |

| 🛓 👩 Oracle Appliance | Manager : 12.1.2.6.0 <@oak1> | X |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|----|
| Configuration Type | | |
| Welcome Welcome Configuration Ty User Group Inform System Informatio Generic Network Dublic Network | Select Configuration Type: Typical (Recommended) Custom SAP Application | |
| Other Network Database Informat Database Informat ASR Information CloudFS Information Summary Install progress Complete | Load an existing configuration: Browse | |
| Help | < <u>B</u> ack <u>N</u> ext > <u>Install</u> Canc | el |

In case you've got an existing config file uploaded to the first net interface, "Browse" and locate the file. If not, select "SAP Application", click Next.

| 🛃 👩 Oracle Appliance | e Manager : 12.1.2 | .6.0 <@oak1> | • | | × |
|--------------------------------------------------------------|--------------------|--------------|--------------------|-----|-----|
| User Group Informati | DATABASE APPLIANCE | | | | |
| o Welcome | | | | | |
| Configuration Typ | GI User: | oracle | GI UserID: | 502 | |
| User Group Inform | DB User: | oracle | DB UserID : | 502 | |
| Generic Network | Install Group: | oinstall | Install GroupID: | 502 | |
| Public Network | DBA Group: | dba | DBA GroupID: | 503 | ٦١ |
| Other Network Database Informat | DBA Oper Group: | oper | DBA Oper GroupID: | 504 | |
| O Database Informat | ASM DBA Group: | asmdba | ASM DBA GroupID: | 505 | ן ר |
| ASR Information CloudFS Informatio | ASM Oper Group: | asmoper | ASM Oper GroupID: | 506 | |
| y Summary | ASM Admin Group: | asmadmin | ASM Admin GroupID: | 507 | |
| Complete | | | | | |
| Help < Back Next > Install Cancel | | | | | |

Set the user id and group id according to your environment. SAP defines the GI user and the DB user as oracle, the Install Group is oinstall, DBA Group is dba, DBA Oper Group is oper, ASM DBA Group is asmdba, ASM Oper Group is asmoor and ASM Admin Group is asmadmin.

| 🙆 👩 Oracle Appliance | Manager : 12.1.2.6.0 <@oak | (1> | | X |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|------------|----|
| System Information | | DATABASE APPLIANCE | | |
| Welcome Configuration Typ User Group Inform System Information Eneric Network Public Network Other Network Database Information ASR Information CloudFS Information Summary Install progress Complete | System Name: Region: Timezone: Database Backup Location: New Root Password: New Root Password(confirm): Disk Group Redundancy | ODA Europe Europe/Berlin Local •••••••••••••••••••••••••••••••••••• | • | |
| Help | | < <u>B</u> ack <u>N</u> ext > In | stall Cano | el |

Set System name and other main parameters, Help button provides assistance if needed. Oracle OS user + root will have identical passwords after deployment.

| 🛃 👩 Oracle Appliance | Manager : 12. | 1.2.6.0 <@oak | 1> | | × |
|------------------------------------|-----------------|---------------|-------------------------------|---------------|-----|
| Generic Network | | | | | |
| Welcome | Domain Name: | wdf.sap.corp | | | |
| User Group Inform | No DNS Servers: | er available | 10 17 122 10 | | |
| Generic Network Public Network | NTP Servers: | 10.17.121.29 | 10.17.122.10 | 10.17.122.27 | |
| Other Network | | | | | |
| ASR Information | | | | | |
| Summary | | | | | |
| Complete ✓ | | | | | |
| Help | | | < <u>B</u> ack <u>N</u> ext > | > Install Can | cel |

| 🛃 👩 Oracle Appliance | Manager | : 12.1.2.6.0 <@oak1> |
|-----------------------------------------------------------------------|-----------|------------------------------------------------------|
| Public Network | | |
| Welcome | | NodeO-Name NodeO-IP Node1-Name Node1-IP |
| User Group Inform | Public | Isoda01 10.20.91.105 Isoda02 10.20.91.106 |
| System Informatio <u>Generic Network</u> | VIP | Isoda1-vip 10.20.91.107 Isoda2-vip 10.20.91.108 |
| Public Network | SCAN | Isoda-scan Addresses 10.20.91.109 10.20.91.110 |
| Other Network Database Informat | Netmask | 255.255.252.0 Gateway 10.20.88.1 |
| Database Informat ASR Information | Interface | bond0 🔻 |
| CloudFS Informatio | | ILOMO-Name ILOMO-IP ILOM1-Name ILOM1-IP |
| Y Install progress | ILOM | Isoda01r 10.20.91.112 Isoda02r 10.20.91.113 |
| Complete | Netmask | 255.255.252.0 Gateway 10.20.88.1 |
| Help | | < <u>B</u> ack <u>N</u> ext > <u>I</u> nstall Cancel |

| 📓 👩 Oracle Appliance | Manager : | 12.1.2.6.0 | <@oak1> | | | × |
|----------------------------------------------------------------|-----------|------------|----------|------------------------------|--------------|-----|
| Other Network | | | | ORACLE DATABASE APPLIANCE | | |
| Welcome | | NodeO-Name | Node0-IP | Node1-Name | Node1-IP | |
| User Group Inform | bond1 | | | | | |
| System Informatio Generic Network | Netmask | | Gateway | | | |
| Public Network | bond2 | | | | | |
| Database Informat | Netmask | | Gateway | | | |
| Database Informat ASR Information | | | | | | |
| CloudFS Informatio | xbond0 | | | | | |
| Summary | Netmask | | Gateway | | | |
| Complete | | | | | | |
| Help | | | < | <u>Back N</u> ext > | Install Cano | :el |

Oracle Database Appliance secondary network support.

| 🙆 👩 Oracle Appliance | Manager : 12.1.2.6.0 <@oa | k1> | |
|---------------------------------------|-----------------------------|-----------------------|----------------|
| Database Information | 1 | DATABASE APPLIANCE | |
| Welcome | Create Initial Database | | |
| User Group Inform | Database Name: | | |
| System Informatio | Is Container Database: | false | - |
| Generic Network Public Network | Database Type: | OLTP | - |
| Uther Network | Database Class: | odb-06 | - |
| Database Informa Database Informat | Database Deployment: | RAC | T |
| ASR Information | Data File Size(GB) | 0 | |
| CloudFS Information Summary | Data Files on Flash Storage | false | ~ |
| Unstall progress | | | |
| └ Complete | | | |
| Help | | < <u>Back N</u> ext > | Install Cancel |

SAP SWPM will be used to create the database. Therefore this step will be skipped.

| 📓 👩 Oracle Appliance | Manager : 12.1.2.6.0 | <@oak1> | |
|-------------------------------------------------------------------------------|------------------------|-------------------------------|----------------|
| Database Information | ı | DATABASE APPLIANCE | |
| Welcome | | | |
| User Group Inform | Database Language: | AMERICAN | - |
| System Informatio | Database Block Size: | 8192 | - |
| Generic Network Public Network | Database Characterset: | AL32UTF8 | - |
| 🔶 Other Network | Database Territory: | AMERICA | - |
| <u>Database Informat</u> Database Informa | National Characterset: | AL16UTF16 | - |
| ASR Information | | | |
| CloudFS Informatio | | | |
| Y Summary | | | |
| Complete | | | |
| Help | | < <u>B</u> ack <u>N</u> ext > | Install Cancel |

| 📓 👩 Oracle Appliance | Manager : 12.1.2.6.0 <@oak1> |
|----------------------|----------------------------------------------------------------|
| ASR Information | |
| Y Welcome | Configure Internal Oracle Auto Service Request (ASR) |
| Configuration Typ | Proxy Server Name: Proxy Server Port: |
| O System Informatio | Proxy Username: Proxy Password: |
| Generic Network | Oracle Online Account Username: |
| Public Network | Oracle Online Account Password: |
| 🔶 Other Network | Configure External Oracle Auto Service Request (ASR) |
| Database Informat | ASR Manager IP/Host Name: |
| ASR Information | ASR Manager Port: |
| CloudFS Informatie | SNMP Version Information for Oracle Auto Service Request (ASR) |
| Summary | SNMP Version 2 |
| 🔶 Install progress 📃 | SNMP Version 3 |
| Complete | ILOM-0 Engine Id: |
| Help | < <u>B</u> ack <u>N</u> ext > Install Cancel |

| 🕌 👩 Oracle Appliance | Manager : 12.1.2.6.0 <@oak1 | 1> | | X |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------|---------------|----|
| CloudFS Information | | DATABASE APPLIANCE | | |
| Welcome Configuration Typ User Group Inform System Informatio Generic Network Public Network Other Network Database Informat Database Informat ASR Information CloudFS Informat Summary Install progress Complete | ✓ Configure Cloud FileSystem Mount Point: File System Size (GB): | /sapmnt 250 | | |
| Help | [| < <u>B</u> ack <u>N</u> ext > | Install Cance | el |

In case one plans to use Oracle Database Appliance to provide /sapmnt use this screen to setup an Oracle CloudFS/ACFS file system.

| 🛃 👩 Oracle Appliance | Manager : 12.1.2.6.0 <@oak1> | X |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| Summary | | |
| Welcome Configuration Typ User Group Inform System Informatio Generic Network Public Network Other Network Database Informat ASR Information <u>CloudFS Informatis</u> Summary | Public Network interface = bond0 Public Network Hostname = (Isoda01 Isoda02) NET1 Interface = bond1 NET2 Interface = bond2 NET3 Interface = xbond0 ILOM IPs = (10.20.91.112 10.20.91.113) ILOM Hostname = (Isoda01r Isoda02r) ILOM Netmask = 255.255.252.0 ILOM Gateway = 10.20.88.1 Disk Group Redundancy = (HIGH HIGH HIGH) CloudF FileSystem Info Configure Cloud FileSystem = True Cloud FileSystem Mount point = /sapmnt Cloud FileSystem size(CB) = 250 Automatic Service Request Configure ASR = False Configure External ASR = False SNMP Version = v2 | |
| Complete | Save the generated configuration Save | |
| Help | < <u>B</u> ack <u>N</u> ext > <u>Install</u> Ca | ncel |

Consider saving the generated configuration and copy the generated config file to a place outside of the device – you may need it on subsequent deployments. Then press the "Install" button.

| So Oracle Appliance | Manager : 12.1.2 | .6.0 <@oak1> | | | × |
|---------------------------------------|------------------|------------------|--------------------|-------|---|
| Welcome | | 56% | | | |
| User Group Inform | S.No | Step | Status | | |
| System Informatio | 12 | SetupStorage | Done | - | |
| Generic Network | 13 | SetupSSHusers | Done Done | | |
| Public Network | 14 | RunGICIonePI | Kunning | | |
| Other Network | 16 | RunRootScripts | | | |
| Database Informat | 17 | GIConfigAssists | | | |
| | 10 | LinestalIDBClone | | _ | |
| Database Informat | 20 | RunDBCIonePl | | 202 | |
| 🖕 ASR Information 👘 | 21 | DbcaDB | | | |
| O CloudES Informatio | 22 | SetupACFS | | | |
| Y cloudys information | 23 | SetupASR | | | |
| ý Summary | 24 | ResecureMachine | | - | |
| 🍥 Install progress 🗕 | | | | | |
| 🗸 Complete 🔽 | | | Show <u>D</u> etai | ls | |
| | | | | | |
| Help | | < <u>B</u> ack | Next > Install | Cance | : |

| 🛃 👩 Oracle Appliance | Manager : 12.1.2.6.0 <@c | oak1> | | × |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------|---------|---|
| Complete | | DATABASE APPLIANCE | | |
| Welcome Configuration Typ User Group Inform System Informatio Generic Network Public Network Other Network Database Informat ASR Information CloudFS Informati Summary Install progress Complete | Oracle Database Appliance Dep | iloyment successful | | |
| Help | | < <u>B</u> ack <u>N</u> ext > | Install | e |

Incomplete or Unsuccessful deployments – please check Oracle Note:1409835.1 ODA (Oracle Database Appliance): Deployment & Cleanup Steps.

At this stage X5-2 deployments have to verify and potentially correct ASM diskgroup compatibility settings as follows:

Login as user Oracle using the client of your choice. As these are shared disks it's a one-time task.

```
[oracle@lsoda01 ]$ . oraenv
+ASM1
[oracle@lsoda01 ]$ asmcmd lsattr -lm | egrep "Name|compatible"
```

If that output would report any non 12.1 output, run following commands for each diskgroup:

```
[oracle@lsoda01 ]$ sqlplus "/ as sysasm"
SQL> alter diskgroup <DG> set attribute `compatible.asm'='12.1.0.2';
SQL> alter diskgroup <DG> set attribute `compatible.advm'='12.1.0.2';
SQL> alter diskgroup <DG> set attribute `compatible.rdbms'='12.1.0.2';
```

This is an irreversible change. Thus, no 11.2.x databases beyond this point for X5-2's.

Rolling back initial DB PSU

We roll back Oracle Patch 21948354 - Database Patch Set Update 12.1.0.2.160119 (Includes CPUJan2016) from all ORACLE_HOMEs per host.

Perform following steps per host:

```
su - oracle
export SBPFUSER=/sbin/fuser
export OHGRID=/u01/app/12.1.0.2/grid
export IHRDBMS=/u01/app/oracle/product/12.1.0.2/dbhome_1
export ORACLE_HOME=$IHRDBMS
echo $ORACLE_HOME (verification)
$ORACLE_HOME/OPatch/opatch rollback -id 21948354 -local -all_subpatches
```

As there is no database associated to this ORACLE_HOME, no further script has to run. Keep in mind copy+pasting above commands may fail due to document to terminal character incompatibility.

Next is the GI home – we borrow these steps from the SAP Bundle Patch for Oracle Database Appliance, Section 3, "SAP Bundle Patch deinstallation" – execute these on both hosts as well:

```
su root -c "$SBPFUSER $IHRDBMS/bin/oracle"
su root -c "/sbin/acfsutil info fs -o mountpoints | xargs $SBPFUSER -mu"
su root -c "$OHGRID/crs/install/rootcrs.pl -prepatch -nonrolling"
env ORACLE_HOME=$OHGRID $OHGRID/OPatch/opatch rollback -id 21948354 -silent -local -
all_subpatches
su root -c "$OHGRID/rdbms/install/rootadd_rdbms.sh"
su root -c "$OHGRID/crs/install/rootcrs.pl -postpatch -nonrolling"
...
Oracle Clusterware active version on the cluster is [12.1.0.2.0]. The cluster
upgrade state is [NORMAL]. The cluster active patch level is [964513507].
```

SAP Software Provisioning Manager on Oracle Database Appliance

The next pages show the Oracle Database Appliance related steps from an SAP Software Provisioning Manager 1.0 perspective. Hence we refer throughout this document this as SWPM. It is recommended to start SWPM with a TMP variable set to /usr/sap/tmp which allows easier post-install cleanup. We start SWPM with the step "RAC/ASM/Database Instance Preparation" to create SAP-specific OS users, create SAP-specific directories and other preparations for an SAP database. This preparation step is required for both nodes of the Oracle Database Appliance. It is however recommended to perform a general prerequisite check per host – SWPM Navigation is visible via the window title.

| Software Prov | isionir | ng | | SA | |
|-----------------------------------------------------------------------------------|----------------|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|--|
| 1 Choose Option rerequisites C | hecker | Define Result | 2 3 4 Parameters Summary Execute Co S | 5 mpleted | |
| etailed Results | rerequisite | anaiysis co | Read the results of the pr | erequisite analysi | |
| Condition | Result Code | Severity | Message | More Information | |
| Free Disk Space | ок | | At least 500 MB of free disk space are required for an Diagnostics Agent installation. Found 3300.75 GB. (Updated 2009-04-17) | Click here | |
| Host | ок | | The host name has to be an alphanumerical string of characters [A-Z] and [a-z] and digits [0-9], and the hyphen (or minus) character "-". Although the newer RFCs permit host names beginning with digits, we recommend that host names begin with an alpha character. Maximum host name length is 13. Current host name: Isoda01. See also SAP Note 611361. (Updated 2005-06-24) | Click here | |
| Supported Linux distributions for SAP Products based on SAP Kernel 7.42. | ок | | Supported Linux distributions for SAP Products based on SAP Kernel 7.42 are Oracle Linux 7 (ORACLE7), Oracle Linux 6 (ORACLE6), Red Hat Enterprise Linux 7 (RHEL7), Red Hat Enterprise Linux 6 (RHEL6), SUSE Linux Enterprise Server 12 (SLES12) and SUSE Linux Enterprise Server 11 (SLES11). Current distribution: ORACLE6. See also <u>SAP Note 171356</u> and http://service.sap.com/pam (Updated 2005-06-24) | Click here | |
| Resource Limit Consistency | ок | | A soft resource limit has to be less than or equal to the corresponding hard limit. This is not the case for the following limits: None. (Updated 2005-06-24) | Not available | |
| RAM Size | ОК | | For the selected services at least 768 MB RAM are required. Current value: 96616 MB. If the current value is much lower than the required value this will significantly slow down the installation or make it even impossible. In this case stop the installation, add more RAM and start it again. (Updated 2005-06-24) | Click here | |
| Swap Size | ок | | the selected services at least 1 MB swap space are recommended. Current value: 24576 MB. Click here pdated 2005-06-24) | | |
| | ок | | For the selected services at least 1 MB swap space are recommended. Current value: 24576 MB. | Click here | |

Following slides illustrate an SAP Netweaver 7.40 SR2 installation using SWPM SP10. SWPM is available via the SLToolset. See SAP Note 1680045 for details on SWPM.

Database Instance Preparation consists of

- » SAP Kernel independent and database dependent parts of the SAP Kernel installation
- » BR*Tools installation as a portion of the database dependent part
- » Oracle Instant Client installation
- » SAP Hostagent installation
- » SAP users and groups creation
- » Preparation of the environment for running the SAP database on Oracle ASM with RAC

Keep following media handy:

- » SAP NetWeaver 7.40 SR2 OS dependent kernel
- » Oracle Client 12c





From Generic Options drill down to Oracle, Database Tools, RAC/ASM/Exadata Database Instance Preparation ABAP – Kernel 7.4.x. Kernel version and stack need to match subsequent SAP NetWeaver product selection.

| SAPinst root@ls | oda01: Generic Options > | Oracle > Database To | ols > RAC/ASM/Exada | ta Database In 📃 🔲 🗙 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Prov | risioning | | | SAP |
| Choose Option | 2 Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Parameter Setti | ngs | | | |
| Choose whether you wan | it to run the installation in a typ | ical or a custom mode. | | |
| Parameter Settings | | | | |
| Parameter Mode O <u>Ty</u> O <u>C</u> u | /pical ustom | | | |
| Additional Information You can run the installat | n Jion either in a typical or a cust | om mode: | | |
| Typical Mode If you choose T selection of pro Note that if you setting is activa background so Custom Mode If you choose C Parameter Sum | ypical, the option is performed impts. If you want to change an choose the <i>Typical</i> setting and ted. You are now guided throu far. <i>ustom</i> , you are prompted for a <i>imary</i> screen. | with default settings. As ny of the default settings, I then choose <i>Back</i> after p gh all screens with the de all parameters. At the end | a result, you only have to you can do so on the <i>Par</i> : processing one or more in fault parameters that hav , you can still change any | respond to a small ameter Summary screen. iput screens, the Custom we been applied in the of these parameters on the |
| | | | | |
| 📕 Back Next 🕨 | | | | |
| Go to net | «t dialog. | | | |

Select Custom Mode.

| 🝯 👩 SAPinst root@lsoda01: Gen | eric Options > C | Dracle > Database Te | ools > RAC/ASM/Exadat | ta Database In 📃 🔲 🗙 |
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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provisioning | | | | SAP |
| Choose Option Define | 2 Parameters ameters | 3 Summary | 4 Execute | Completed |
| Enter the profile directory of the SAP \mathfrak{s} | /stem. | | | |
| SAP System Identification | | | | |
| Profiles Available | | | | |
| Profile Directory | | | | Ē |
| Existing parameters are retrieved from follows: Windows: \\ <sapglobalhost UNIX and i5/OS: /<sap moun<="" td=""><td>n the SAP system p</td><td>orofile directory. The lo D>\SYS\profile APSID>/profile or /</td><td>cation of your SAP system usr/sap/<sapsid>/SYS/f</sapsid></td><td>profile directory is as</td></sap></sapglobalhost | n the SAP system p | orofile directory. The lo D>\SYS\profile APSID>/profile or / | cation of your SAP system usr/sap/ <sapsid>/SYS/f</sapsid> | profile directory is as |
| Back Next | | | | |
| Go to next dialog. | | | | |

Deselect "Profiles are available", fresh installations don't offer SAP profiles.

| SAPinst root@ls | oda01: Generic Options > | Oracle > Database To | ools > RAC/ASM/Exadat | a Database In 📃 🔲 🛛 🗙 |
|------------------------------------------------------|-----------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Prov | isioning | | | SAP |
| Choose Option | 2 Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| General SAP Sys | tem Parameters | | | |
| Enter the SAP system ID. | | | | |
| SAP System | | | | |
| SAP System ID (SAPSID)* | ADO | | | |
| SAP Mount Directory | /sapmnt | | | Browse |
| The SAP System ID is an The system is installed u | identifier for your SAP system. Inder /usr/sap/ <sapsid>/</sapsid> | It must be unique throu; Common directories a | ghout your system landsca re linked to <sap d<="" mount="" td=""><td>pe. i rectory>/<sapsid>/</sapsid></td></sap> | pe. i rectory>/ <sapsid>/</sapsid> |
| ▲ Back Next ▶ | | | | |
| Go to next | dialog. | | | |

Set the SAP system ID; we choose ADO here for both SAP SID and Oracle SID. The mountpoint /sapmnt has been created earlier via the Oracle Appliance Manager setup.

| 📴 👩 SAPinst root@lsoda01: Ge | eneric Options > | · Oracle > Database T | ools > RAC/ASM/Exadat | ta Database In 📃 🗖 🛛 🗙 |
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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provisionin | g | | | SAP |
| Choose Option Defin | 2 e Parameters | 3 Summary | 4 Execute | 5 Completed |
| DNS Domain Name | | | | |
| Enter the DNS domain name for the | SAP system to calc | ulate the fully qualified d | omain name (FQDN). | |
| SAP System Domain Name | | | | |
| Set FQDN for SAP system | | | | |
| DNS Domain Name for SAP System* | wdf.sap.corp | | | |
| The DNS Domain Name is used to o SAPLOCALHOSTFULL. This paramete | alculate the Fully C | Qualified Domain Name (F | QDN), which is configured and Java application serv | in profile parameter ers. See SAP Note <u>654982</u> . |
| <u>Back</u> <u>N</u> ext ▶ | | | | |
| Go to next dialog. | | | | |

| SAPinst root@lsoda01: Generic Options > Oracle > File SAPinst Holp | Database Tools > RAC/ASM/Exadata D | atabase In 💶 🔲 🗙 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|----------------------------------------------|
| Elle SAFINST Help | | |
| Software Provisioning | | SAP |
| Choose Option Define Parameters Sum | 3 4 mary Execute | 5 Completed |
| Media Browser | | |
| Enter the location of the required software packages. | | |
| Software Package Request | | |
| Medium | Package Location | |
| UC Kernel NW740 | /media/NW740_SR2_OS_dependent_kerne | el Browse |
| Additional Information The required software parkages available on the medium are de | terted using the identification files LABEL . AS | C or LABEL TDX, ASC |
| The required software packages available on the medium are de If there is a complete medium available on the installation host, ye in the Package Location column. | tected using the identification files LABEL.AS ou only need to enter the path to the root dir | C or LABELIDX, ASC. rectory of the medium |
| | | |
| Go to next dialog. | | |

| SAPinst root@l | soda01: Generic Options a | > Oracle > Database T | ools > RAC/ASM/Exada | ta Database In 📃 🔲 🗙 |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------|--------------------------|
| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Prov | visioning | | | SAP |
| Choose Option | 2 Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Master Passwo | rd | | | |
| Enter the master passwo | ord for all users. | | | |
| | | | | |
| Master Password The master password in Check the F1 help for m | s used for all users that are cr estrictions and dependencies. | reated, as well as for the s | secure store key phrase. | |
| Password for All Users* | * * * * * * * * | | | |
| Confirm* | * * * * * * * * | | | |
| Additional Informatio If you want to set an inc <i>Summary</i> screen. If you set individual pas | n dividual password for each use sswords, a new master passwo | er, you can do this in the c ord does not overwrite the | corresponding parameter s ese individual settings. | section on the Parameter |
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| Go to nex | t dialog. | | | |

| 📴 💽 SAPinst root@lsoda01: Gener | ic Options > Ora | acle > Database 1 | fools > RAC/ASM/Exad | ata Database In 📃 🗖 🛛 🗙 |
|----------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------------------------------|--------------------------------------|-------------------------|
| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provisioning | | | | SAP |
| 1 Choose Option Define Pa | rameters | 3 Summary | 4 Execute | 5 Completed |
| Operating System Users | | | | |
| Enter the account parameters. | | | | |
| SAP System Administrator | | | | |
| Account: adoadm | | | | |
| Password of SAP System Administrator* | * * * * * * * * | 1 | | |
| Confirm* | * * * * * * * * |] | | |
| <u>U</u> ser ID | 503 | - | | |
| <u>G</u> roup ID of sapsys | 509 | | | |
| Login Shell | /bin/csh 🛅 | | | |
| Home Directory | | | | Browse |
| Additional Information The fields User ID, Group ID, and Home If you enter specific user or group IDs, n | Directory should r nake sure they do | normally be left emp not conflict with oth | nty. er IDs you enter later in ti | he installation. |
| 📕 Back Next 🕨 | | | | |
| Go to next dialog. | | | | |

User IDs, Group IDs shall be carefully selected. Blank items will cause SPWM to choose default values.

| SAPinst root@lsoda01: | Generic Options > | Oracle > Database Too | ols > RAC/ASM/Exadata [| Database In 💶 🔲 🗙 |
|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|--------------------|
| Software Provisior | ning | | | SAP |
| Choose Option | 2 efine Parameters | 3 Summary | 4 Execute | Completed |
| SAP System Databas | e | | | |
| Enter the database parameters. | | | | |
| Database Identification | | | | |
| <u>D</u> atabase ID (DBSID)* | ADO | | | |
| Oracle Database Installation for | r O ≦ingle Instance on Filesystem O Single Instance on Shared Oracle Home O Single Instance on Oracle ASM O <u>R</u> AC on Filesystem ● R <u>A</u> C on Oracle ASM | | | |
| Type of RAC RAC on Engineer | red Systems (Exadat | a, SPARC SuperCluster | , Database Appliance) (| |
| Databas <u>e</u> Host | 1soda01 | | | |
| Additional Information | | | | |
| For SAP system with a r You can also enter the l | iew database instance DBSID of an existing o | e, enter the <i>Database ID (L</i> latabase instance and add | <i>BSID</i>) for the database insta the SAP system there. | nce to be created. |
| ▲ Back Next ► | | | | |
| Go to next dialog | J. | | | |

Set the Oracle SID. Select RAC on Oracle ASM, "type" becomes "RAC on Engineered Systems".

| SAPinst root@lsoda01: Gen | eric Options > O | racle > Database ` | Tools > RAC/ASM/Exad | ata Database In 📃 🗖 💈 |
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| Software Provisioning | I | | | SAP |
| Choose Option Define Database Administrator Enter the account parameters. | 2 Parameters | 3 Summary | 4 Execute | Completed |
| Database Administrator (OS User) Account: oraado Password of Database Administrator Confirm* User ID Group ID of dba Group ID of oper Login Shell Home Directory Additional Information The fields User ID and Group ID shou If you enter specific user or group IDs | source they do |] empty: p not conflict with oth | er IDs you enter later in th | Browse ne installation. |
| Back Next | | | | |

| File SAPinst root@lsoda01: Gen | eric Options > Ora | acle > Database | Tools > RAC/ASM/Exada | ta Database In 📃 🗖 🗙 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|-------------------------------------|-------------------------------|----------------------|
| Software Provisioning | I | | | SAP |
| Choose Option Define SAP System Administrat Enter the password of the SAP system | 2 Parameters Or administrator. | 3 Summary | 4 Execute | 5 Completed |
| SAP System Administrator Account: sapadm Password of SAP System Administrato Confirm* User ID Group ID of sapsys Additional Information The fields User ID and Group ID shou If you enter specific user or group IDs | t ******** 505 509 Id normally be left er , make sure they do |] npty. not conflict with oth | er IDs you enter later in the | e installation. |
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| 📴 👩 SAPinst root@lsoda01: Generic Options > Oracle > Database Tools > F | AC/ASM/Exadata Da | atabase In 📃 🗖 🛛 🗙 |
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| Eile SAP <u>i</u> nst <u>H</u> elp | | |
| Software Provisioning | | SAP |
| 1 2 3 Choose Option Define Parameters Summary Oracle Database Configuration Enter the parameters of the ABAP database system. | 4 Execute | 5 Completed |
| Database Schema | | |
| The ABAP schema is used for the operating system environment of the application serve | er instance. | |
| ABAP Schema* SAPSR3 | | |
| Database Server Version 121 🖺 | | |
| Database Client Version 121 | | |
| Back Next | | |
| Lu tu next dialog. | | |

| 📴 👩 SAPinst roo | t@lsoda01: Generic Options > | • Oracle > Database To | ols > RAC/ASM/Exadat | a Database In 📃 🗖 🛛 🗙 |
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| <u>E</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software P | rovisioning | | | SAP |
| Choose Option | 2 Define Parameters Ter Configuration | 3 Summary | 4 Execute | 5 Completed |
| Enter the listener na | me, port and domain. | | | |
| Attention | | | | |
| We recommend that you have more that If you decide to ke instead of replacing | it you do not change the default va none Oracle database on this insta ep the entries in an existing networ g the file. | lues for <i>Listener</i> and <i>Listei</i> Ilation host. In this case, s k configuration file, SAPins | <i>ner Port</i> . You may change ee SAP Note <u>98252</u>. It will merge the new entrie | these default values only if es into the existing file |
| Oracle Listener C | onfiguration | | | |
| <u>L</u> istener* | LISTENER | | | |
| Li <u>s</u> tener Port* | 1521 | | | |
| <u>D</u> omain* | WORLD | | | |
| NetWork Configu | ration Files | | | |
| <u>K</u> eep listener.ora | \checkmark | | | |
| K <u>e</u> ep tnsnames.ora | . 🖌 | | | |
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| 🝯 💽 SAPinst root@lso | da01: Generic Options > | Oracle > Database To | ols > RAC/ASM/Exada | ta Database In 📃 🔲 🔉 |
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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provis | sioning | | | SAP |
| Choose Option | 2 Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Media Browser | | | | |
| Enter the location of the red | quired software packages. | | | |
| | | | | |
| Software Package Reque | st | | | |
| Medium | | Package Lo | ocation | |
| Oracle Client 121 | | /media/Or | acle_client_12 | Browse |
| | | | | |
| Additional Information The required software pao If there is a complete med in the Package Location co | ckages available on the med lium available on the installa lumn. | dium are detected using th ation host, you only need to | ne identification files LABE o enter the path to the ro | L.ASC or LABELIDX.ASC. ot directory of the medium |
| ▲ Back Next ▶ | | | | |
| Go to next dia | alog. | | | |

| 📴 💽 S/ | APinst root@lsoda01: Gene | ric Options > Or | acle > Database Tools > RAC/AS | SM/Exadata Database I | n _ 🗆 🛛 | |
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| <u>F</u> ile SA | AP <u>i</u> nst <u>H</u> elp | | | | | |
| Soft | ware Provisioning | | | | SAP | |
| Ch | 1 oose Option Define P | 2 arameters | 3 4 Summary Exect | ute Comple | eted | |
| Unpa | ck Archives | | | | | |
| Select th | e archives you want to unpack. | | | | | |
| SAP Sys The inst automat | stem Archives tallation procedure has determi tically from the media to the SA s to Be Unpacked | ned that the selecte P global host. | ed archives have to be unpacked. Cl | hoose Next to unpack the | archives | |
| Unpack | k Archive | Codenage | Destination | Downloaded To | | |
| | DBINDEP/SAPEXE_SAR | Unicode | /usr/san/ADD/SYS/eye/uc/liv | n | Browse | |
| | ORA/SAPEXEDB_SAR | Unicode | /usr/sap/ADD/SYS/eye/uc/lig | n | Browse | |
| | | Unicode | /usr/san/ADD/SYS/eye/uc/lig | n | Browse | |
| | 0CL12164.SAR | | /oracle/client/12x | | Browse | |
| | | | | | | |
| Additio If you had a column. Deselect which the Additio If you aud from the product | ave downloaded newer version: t <i>Unpack</i> for archives that you whe installation user does not hav onal Information for SAP HAN re installing a product based or e SAP Service Marketplace and t based on kernel version 7 20 | s of these archives f want to unpack mar we write permission: A DSAP HANA please enter their respecti- please use the arch | rom SAP Service Marketplace, enter nually: for instance if the destination 5. download the latest SAPEXE.SAR an we download locations in the <i>Downlo</i> ives of kernel version 7.21. | their locations in the <i>Dow</i> is located on a network sh d SAPEXEDB.SAR of your S vaded To column. If you ar | nloaded To Iare for AP kernel e installing a | |
| Back | Next 🕨 | | | | | |

Go to next dialog.

| SAPinst root@lsod | a01: Generic Options > | Oracle > Database Te | ools > RAC/ASM/Exadat | ta Database In 📃 🔲 🗙 |
|--------------------------------------|------------------------------|--------------------------|-----------------------------|--------------------------|
| <u>Eile SAPi</u> nst <u>H</u> elp | | | | |
| Software Provis | ioning | | | SAP |
| Choose Option | 2 Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Oracle Database | | | | |
| Enter the parameters of the | database GRID environment | t. | | |
| | | | | |
| Database Instance | | | | |
| ORACLE_HOME for GRID | /u01/app/12.1.0 | .2/grid | | Browse |
| O <u>R</u> ACLE_SID for GRID* | +ASM1 | | | |
| Or <u>a</u> cle GRID Software Not Ir | nstalled 🗌 | | | |
| Additional Information | stem user oracile belongs t | o group conjust other | wise the available dick are | ouns cannot be selected |
| make sure that operating s | ystem user of acte belongs (| to group sapriist, otier | wise the available disk git | sups cannot be selected. |
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| Go to next dial | og. | | | |

Set the ORACLE_HOME for GRID and the ASM instance according to actual values having deployed earlier via Oracle Appliance Manager setup.

| 🚺 👩 SAPinst root@lsod | a01: Generic Options > Or | acle > Database Te | ools > RAC/ASM/Exadata | Database In 📃 🔲 🗙 |
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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provis | ioning | | | SAP |
| Choose Option | 2 Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Enter the parameters of the | database RAC – for Oracle exp | perts only. | | |
| Database RAC Parameters | s | | | |
| <u>D</u> atabase Name | ADO | | | |
| N <u>u</u> mber of Instances | 2 | | | |
| <u>S</u> can Listener* | 1soda-scan | | | |
| S <u>c</u> an Listener Port | 1521 | | | |
| Length of Instance Number | <u>O</u>ne Character (1 9) Three Characters (001 | 009) | | |
| Additional Information Enter the number of Oracle | database instances. The value | should be between | 2 and 9. The default is 2. | |
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| Go to next dia | log. | | | |

| SAPinst root@lsoda01: Generic Options > Oracle > Da | atabase Tools > RAC/ASM/Exadata Database In | |
|---------------------------------------------------------------------|---------------------------------------------|-----|
| Elle SAPInst Help | | |
| Software Provisioning | | SAP |
| Choose Option Define Parameters Summa | ary Execute Complet | ed |
| Oracle Database RAC Parameters | | |
| Enter the parameters of the database RAC – for Oracle experts only. | | |
| Database Parameters for RAC | | |
| Host Name | Instance No. | |
| 1soda01 | 001 | |
| 1soda02 | 002 | |
| | | |
| Additional Information Modify all @@ parameters (Host Name). | | |
| Back Next | | |

Here we need to ensure that actual hostnames fit to Oracle Instance ID's. Thus, on Isoda01 we run instance 001 whereas we run on Isoda02 instance 002.

Next 5 screenshots show the full install review screens; please check carefully and if needed revise. Portions of screens distinguish by the vertical scrollbar.

| 🗊 💿 SAPinst root@lsoda01: Generic Options > Oracle > Database Tools > RAC/ASM/Exadata Database In 🔤 🗖 Eile SAPinst Help | × |
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| Software Provisioning | |
| 1 2 3 4 5 Choose Option Define Parameters Summary Execute Completed | |
| Parameter Summary | |
| Choose 'Next' to start with the values shown. Otherwise, select the parameters to be changed and choose 'Revise'. You are then take to the screen where you can change the parameter. You might be guided through other screens that have so far been processed. | ≥n |
| Master Password Password for All Users | • |
| Operating System Users Password of SAP System Administrator Login Shell //bin/csh T Home Directory | |
| SAP System Database Database ID (DBSID) ADD Oracle Database Installation for RAC on Oracle ASM Type of RAC RAC on Engineered Systems (Exadata, SPARC SuperCluster, Database Appliance) | |
| Database Administrator Password of Database Administrator User ID 504 Group ID of dba | 4 |
| Bark Mext N Dause | |

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| Software Provisioning | SAP |
| Choose Option Define Parameters Summary Execute | 5 Completed |
| Parameter Summary | |
| Choose 'Next' to start with the values shown. Otherwise, select the parameters to be changed and choose to the screen where you can change the parameter. You might be guided through other screens that have | 'Revise'. You are then taken so far been processed. |
| Database Administrator | |
| Password of Database Administrator | |
| User ID 505 Group ID of sapsys 509 | |
| Oracle Database Configuration ABAP Schema SAPSR3 | ▲ ▼ |
| Back Next Ervise | |

| SAPinst root@Isoda01: Generic Op File SAPinst Help | otions > Oracle > Database T | bols > RAC/ASM/Exada | ata Database In 💶 🔲 🗙 |
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| Software Provisioning | | | SAP |
| Choose Option Define Parameter Summary | ers Summary | 4 Execute | 5 Completed |
| Choose 'Next' to start with the values shown. (to the screen where you can change the parar | Otherwise, select the parameters t neter. You might be guided throug | o be changed and choose gh other screens that have | e 'Revise'. You are then taken e so far been processed. |
| Oracle Database Configuration ABAP Schema SAPSR3 Database Server Version 121 ■ Database Client Version 121 ■ Oracle Listener Configuration Listener 1soda-scan Listener Port 1521 Domain WORLD ✓ Keep listener.ora ✓ Keep tnsnames.ora | | | ▲ |
| Software Package Medium Oracle Client 121 | Package L /media/0 | ocation racle_client_12 | |
| Back Next Revise | | | • |

| SAPinst root@lsoda01: Generic (| Options > Oracle > Data | base Tools > RAC/ASM/Ex | kadata Database In 📃 🗖 🛛 🗙 |
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| Eile SAP <u>i</u> nst <u>H</u> elp | | | |
| Software Provisioning | | | SAP |
| Choose Option Define Param | eters Summary | 4 Execute | 5 Completed |
| Parameter Summary | | | |
| Choose 'Next' to start with the values shown to the screen where you can change the par | . Otherwise, select the para ameter. You might be guide | meters to be changed and ch d through other screens that | noose 'Revise'. You are then taken have so far been processed. |
| | | | |
| Unpack Archives | | | • |
| Archives to Be Unpacked | | | |
| Unpack Archive | Codepage | Destination | Downloaded To |
| DBINDEP/SAPEXE.SAR | Unicode | /usr/sap/ADO/SYS/ex | |
| ORA/SAPEXEDB.SAR | Unicode | /usr/sap/ADO/SYS/ex | |
| ORA/DBATOOLS SAR | Unicode | /usr/san/ADD/SYS/ey | |
| | | | |
| 🗆 Oracle Database | | | |
| | | | |
| Uu91/app/12_1_0_2/grid | | | |
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| Oracle CRID Seftware Net Installed | | | |
| | | | |
| Oracle Database RAC Parameters | | | |
| Number of Instances | | | |
| Scan Listener | | | |
| lsoda-scan | | | |
| Scan Listener Port | | | |
| 1521 | | | |
| Longth of Instance Number | | | |
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| SAPinst root@lsoda01: Ger | eric Options > Oracle > D | atabase Tools > RAC/ASM/E | xadata Database In 📃 🗖 🛛 🗙 |
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| Software Provisioning | J | | SAP |
| Choose Option Define | 2 3 Parameters Summ | ary Execute | 5 Completed |
| arameter Summary | | | |
| hoose 'Next' to start with the values o the screen where you can change th | shown. Otherwise, select the p le parameter. You might be gu | arameters to be changed and c ided through other screens tha | hoose 'Revise'. You are then taken t have so far been processed. |
| | Unicode | /usr/san/ADD/SYS/ey | |
| Ornela Database | | | |
| | | | |
| /u01/app/12.1.0.2/grid | | | |
| ORACLE_SID for GRID | | | |
| +ASM1 | | | |
| 🗌 Oracle GRID Software Not Ins | talled | | |
| Oracle Database RAC Paramet | ers | | |
| Number of Instances | | | |
| Scan Listener | | | |
| 1soda-scan | | | |
| Scan Listener Port | | | |
| 1521 | | | |
| Length of Instance Number | | | |
| Three Characters (001 . | . 009) 🗈 | | |
| 🗌 Oracle Database RAC Paramet | ers | | - |
| Host Name | | Instance No. | |
| 1soda01 | | 001 | |
| 1soda02 | | 002 | |
| | | | |
| | | | |
| Back Next Revise | | | |
| Terre Terre | | | |
| | | | |

Install complete window.



Repeat this step "Database Instance Preparation" on the second node. Note we still do not have an SAP database installation yet even when completed preparations on both hosts. Covered in the next steps.

SWPM: ASCS Instance installation

Before we can move on and create a database instance SAP requires to have a Application Server ABAP Central Services instance. For later HA awareness of the ASCS Instance we follow SAP Note 1877857. HA aware ASCS installations need to be on a shared location, namely /usr/sap/<SAPSID>, here we consume /sapmnt for this, and put this under /sapmnt/share from the first host. Ideally you'd use a separate ACFS or other shared filesystem.

mkdir -p /sapmnt/share ; cd /usr/sap ; tar cvf ADO.tar ADO

cp ADO.tar /sapmnt/share ; cd /sapmnt/share ; tar xvf ADO.tar

- # cd /usr/sap ; rm ADO.tar ; mv ADO was.ADOlocal
- # ln -s /sapmnt/share/ADO ADO ; chown adoadm:sapsys ADO

Repeat the last 2 lines for the second host. Thus, host file system equivalence for /usr/sap/<SAPSID>.

On the first host we start the VIP:

crsctl start ip -A 10.20.88.62/255.255.252.0/bond0
And invoke SWPM on the virtual host using ./sapinst SAPINST_USE_HOSTNAME=Isadoascs



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| <u>E</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Prov | isioning | | | SAP |
| Choose Option | 2 Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| General SAP Sys | stem Parameters | | | |
| Enter the SAP system ID. | | | | |
| SAP System | | | | |
| SAP System ID (SAPSID)* | ADO | | | |
| SAP Mount Directory | /sapmnt | | | Browse |
| The system is installed (| nder/usr/sap/ <sapsid>/</sapsid> | . Common directories a | re linked to <sap d<="" mount="" th=""><th>i'rectory>/<sapsid>/</sapsid></th></sap> | i'rectory>/ <sapsid>/</sapsid> |
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| Software Provisionin | g | | | SAP |
| Choose Option Defin | 2 e Parameters | 3 Summary | 4 Execute | Completed |
| DNS Domain Name | | | | |
| Enter the DNS domain name for the : | SAP system to calc | ulate the fully qualified do | omain name (FQDN). | |
| SAP System Domain Name | | | | |
| Set FQDN for SAP system | | | | |
| <u>D</u> NS Domain Name for SAP System* | wdf.sap.corp | | | |
| The DNS Domain Name is used to c SAPLOCALHOSTFULL. This parameter | alculate the Fully (| Qualified Domain Name (F ine the URLs for the ABAP | QDN), which is configured and Java application serv | in profile parameter ers. See SAP Note <u>654982</u> . |
| <u>Back</u> <u>N</u> ext ▶ | | | | |
| Go to next dialog. | | | | |

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| Software Provisioning | | SAP |
| Choose Option Define Parameters Summary | / Execute | 5 Completed |
| Media Browser | | |
| Enter the location of the required software packages. | | |
| | | |
| Software Package Request | | |
| Medium | Package Location | |
| UC Kernel NW740 SR2 | /media/NW740_SR2_OS_dependent_kernel | Browse |
| | | |
| Additional Information The required software packages available on the medium are detecte If there is a complete medium available on the installation host, you of in the <i>Package Location</i> column. | d using the identification files LABEL.ASC only need to enter the path to the root direct | r LABELIDX.ASC. Dry of the medium |
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| Go to next dialog. | | |

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| Software Provision | ning | | | SAP |
| Choose Option D | 2 efine Parameters | 3 Summary | 4 Execute | 5 Completed |
| Master Password | | | | |
| Enter the master password for a | ll users. | | | |
| | | | | |
| Master Password The master password is used fo Check the F1 help for restriction | or all users that are cre is and dependencies. | eated, as well as for the s | ecure store key phrase. | |
| Password for All Users* | *** | | | |
| Confirm* | * * * | | | |
| Additional Information If you want to set an individual p <i>Summary</i> screen. If you set individual passwords, | assword for each use a new master passwo | r, you can do this in the c rd does not overwrite the | orresponding parameter s se individual settings. | ection on the Parameter |
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| Go to next dialog. | 1 | | | |

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| <u>E</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provisionir | ıg | | | SAP |
| Choose Option Defin | 2 ne Parameters | 3 Summary | 4 Execute | 5 Completed |
| Enter the instance parameters for th | ne ABAP central serv | vices (ASCS) instance. | | |
| ASCS Instance The following SAP system instances | already exist on th | is host: | | |
| SAP System ID (SAPSID) | Instance 1 | Name | | Instance Number |
| | | | | |
| | | | | |
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| | | | | |
| | | | | |
| | | | | |
| ASCS Instance Number* | | | | |
| ASCS Instance Virtual Host* 1sado | Dascs | | | |
| Additional Information The ASCS instance requires an <i>Inst</i> assigned memory. They must be u | <i>ance Number</i> and a nique for this install | . <i>Virtual Host Name</i> as a t ation host. | echnical identifier for inte | rnal processes, such as |
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| Go to next dialog. | | | | |

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| Software Provisioning | | | SAP |
| Choose Option Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| ABAP Message Server Ports | | | |
| Enter the required message server ports. | | | |
| ABAP Message Server Ports | | | |
| ABAP Message Server Port 3600 | | | |
| Internal ABAP Message Server Port 3900 | | | |
| Addutional information The instance-specific internal ABAP Message Server Po as unique communication channels. | v/t for internal communi | cation and the <i>ABAP Messa</i> , | ge Server Port are required |
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| Software Provisioning | | | SAP |
| Choose Option Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Parameter Summary | | | |
| Choose 'Next' to start with the values shown. Other to the screen where you can change the parameter | wise, select the parameters t . You might be guided throug | o be changed and choose gh other screens that have | : 'Revise'. You are then taken : so far been processed. |
| Parameter list | | | |
| General SAP System Parameters SAP System ID (SAPSID) ADD SAP Mount Directory /sapmnt | | | |
| DNS Domain Name Set FQDN for SAP system | | | |
| Software Package | | | |
| Medium UC Kernel NW740 SR2 | Package Location | OS dependent kernel | |
| | | | |
| Master Password Password for All Users | | | _ |
| ASCS Instance | | | |
| ASCS Instance Number | | | |
| ASCS Instance Virtual Host | | | ▲ |
| I sadoascs | | | V |
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| Continue processing | | | |



ASCS installation completed at this point. As we're still in the context of SAP Note 1877857 next we install the Enqueue Replication Server (ERS), on both hosts locally. As this is pretty straightforward slides are omitted here. Once ERS installations have been completed, next steps are as <sidadm> on the installation hosts of ASCS:

lsoda01: adoadm> sapcontrol -nr 00 -function Stop
lsoda01: adoadm> sapcontrol -nr 00 -function StopService
Switch to root on this host, issue:

[root@lsoda01]# crsctl stop ip -A 10.20.88.62/bond0

Login as root to the 2nd clusternode, restart the IP there:

```
[root@lsoda02]# . oraenv
+ASM2
[root@lsoda02]# crsctl start ip -A 10.20.88.62/255.255.252.0/bond0
[root@lsoda02]# /usr/sap/hostctrl/exe/saphostctrl -function RegisterInstanceService -
sid ADO -nr 00 -saplocalhost lsadoascs
[root@lsoda02]# /etc/init.d/sapinit stop
```

Edit /etc/init.d/sapinit, comment lines 438-444 (including) according to the whitepaper of SAP Note 1877857.

Repeat the steps sapinit stop and edit /etc/init.d/sapinit back on the first node.

Eventually on the first node restart sapinit as root: # /etc/init.d/sapinit start and start ASCS services manually for the subsequent SAP Database Instance installation.

lsoda01: adoadm> sapcontrol -nr 00 -function StartService ADO
lsoda01: adoadm> sapcontrol -nr 00 -function Start
lsoda01: adoadm> sapcontrol -nr 00 -function GetProcessList

Later on we complete the HA integration. At this point we are finished with the content of SAP Note 1877857.

SAP Oracle Home Naming Requirements

The successful installation and operation of any SAP utility such as SWPM or BR*Tools on the database nodes of the Oracle Database Appliance requires some preparation for the correct setting of the ORACLE_HOME environment variable in the SAP environment. The SAP environment requires the ORACLE_HOME environment variable to be set to /oracle/<SID>/<release>.

To create an SAP database, SWPM looks for the ORACLE_HOME directory. If there is a suitable installation with the Oracle RDBMS software correctly installed SWPM will not extract the RDBMS install media; it will use the existing installation.

SWPM looks for the RDBMS software in /oracle/<SID>/<release> - standard path of SAP for the Oracle RDBMS software. The Oracle Database Appliance Software deployment installs the RDBMS software under /u01/app/oracle/product/12.1.0.2/dbhome_1.

Therefore we need to create a symbolic link on both nodes.

Login to the nodes and create the directory /oracle and /oracle/<SID>.

We use here ADO as the <SID>

[root@lsoda01 /] # mkdir /oracle
[root@lsoda01 /] # chown oracle:oinstall /oracle
[root@lsoda01 /] # su - oracle

Create the symbolic link:

[oracle@lsoda01 /]\$ mkdir -p /oracle/ADO
[oracle@lsoda01 /]\$ ln -s /u01/app/oracle/product/12.1.0.2/dbhome 1 /oracle/ADO/121

Repeat above steps on the second node.

At this point we're ready for the Oracle Database installation.

SWPM: Oracle Database Instance

Depending on your deployment scenario and as outlined in the SAP Installation Guide it is required to install the necessary ABAP central services instance (ASCS) first, plus, having created the symbolic links for ORACLE_HOME. We have done these in the previous two steps.

Keep following media handy:

- » SAP NetWeaver 7.40 SR2 OS dependent kernel
- » Installation Export SAP NetWeaver 7.40 SR2, EXP1
- » Oracle Client 12c

SAP Database instance installation is described on the next pages. These steps need to be performed on <u>one of the</u> <u>nodes of Oracle Database Appliance only</u>.

<u>Caveat:</u> Database Instance Installation may fail if the shared profile value for SAPDBHOST is not matching the installation host: grep SAPDBHOST /sapmnt/ADO/profile/DEFAULT.PFL

In that case, correct SAPDBHOST setting towards the local hostname.

Login to the first node Isoda01 and invoke SPWM:

./sapinst SAPINST_USE_HOSTNAME=Isadodb

Navigate right away to the shown item below.



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|-------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------|
| Software | Provis | sioning | | | SAP |
| Choose Opt General SA Enter the profile | iion I <mark>P Syst</mark> i directory o | 2 Define Parameters em Parameters f the SAP system. | 3 Summary | 4 Execute | Completed |
| SAP System Ide | ntification | n | | | |
| <u>P</u> rofiles Available | 2 🗹 | | | | |
| P <u>r</u> ofile Directory | /sapmnt | t/ADO/profile | | | ۲. |
| Additional Info Existing parame follows: • Window • UNIX ar | rmation ters are re | trieved from the SAP system SLOBALHOST>\sapmnt\ <sap (SAP Mount Directory>/<</sap | n profile directory. The lo SID>\SYS\profile (SAPSID>/profile or / | cation of your SAP system (usr/sap/ <sapsid>/SYS/</sapsid> | profile directory is as |
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This time we have profiles available, however we correct their location towards /sapmnt/ADO/profile.

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| Software Provisioning | | | SAP |
| Choose Option Define Parameters | 3 Summary | 4 Execute | Completed |
| Master Password | | | |
| Enter the master password for all users. | | | |
| | | | |
| Master Password The master password is used for all users that are cr Check the F1 help for restrictions and dependencies. | reated, as well as for the s | secure store key phrase. | |
| Password for All Users* ******* | | | |
| Confirm* | | | |
| Additional Information If you want to set an individual password for each use Summary screen. If you set individual passwords, a new master passwo | er, you can do this in the o ord does not overwrite the | corresponding parameter : ese individual settings. | section on the Parameter |
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| Software Provision | ing | | | SAP |
| Choose Option Def | 2 Tine Parameters | 3 Summary | 4 Execute | 5 Completed |
| DNS Domain Name | | | | |
| Enter the DNS domain name for th | e SAP system to calcu | late the fully qualified d | omain name (FQDN). | |
| SAP System Domain Name | | | | |
| Set FQDN for SAP system | | | | |
| <u>D</u> NS Domain Name for SAP Syster | m* wdf.sap.corp | | | |
| Additional information The DNS Domain Name is used to SAPLOCALHOSTFULL. This parame | o calculate the Fully Q | Jalified Domain Name (F | QDN), which is configured and Java application serve | in profile parameter ers. See SAP Note <u>654982</u> . |
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| <u>Eile SAPinst H</u> elp | | | | |
| Software Provisioning | | | | SAP |
| Choose Option Define Parameters Su | 3 Immary | 4 Execute | Complet | ted |
| Media Browser | | | | |
| inter the location of the required software packages. | | | | |
| | | | | |
| oftware Package Request | | | | |
| Medium | Package | Location | | |
| UC Kernel NW740 SR2 | /media/M | IW740_SR2_OS_dependent | t_kernel | Browse |
| | | | | |
| Additional Information The required software packages available on the medium are o If there is a complete medium available on the installation host, in the Package Location column. | detected using tl you only need t | ne identification files LABE o enter the path to the ro | L.ASC or LABEL ot directory of th | IDX.ASC. e medium |
| Eack Next F | | | | |

| SAPinst root@lsoda01: <u>File SAPinst Help</u> | SAP NetWeaver 7. | .4 Support Release 2 > (| Oracle > SAP Systems : | > Applicatic 💶 🛛 🗙 |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------|---------------------|
| Software Provisior | ning | | | SAP |
| Choose Option | 2 efine Parameters | 3 Summary | 4 Execute | 5 Completed |
| SAP System Databas | e | | | |
| Enter the database parameters. | | | | |
| Database Identification | | | | |
| <u>D</u> atabase ID (DBSID)* | ADO | | | |
| Oracle Database Installation for | ○ Single Instance on ○ Single Instance on ○ Single Instance on ○ <u>R</u>AC on Filesystem ③ <u>R</u>AC on Oracle AS | i Filesystem i Shared Oracle Home i Oracle ASM n M | | |
| Type of RAC RAC on Engineer | red Systems (Exadat | ta, SPARC SuperCluster, | Database Appliance) | |
| Databas <u>e</u> Host | 1sadodb | | | |
| Additional Information | | | | |
| ● For SAP system with a r ● You can also enter the l | new database instance DBSID of an existing o | e, enter the <i>Database ID (D</i> l database instance and add | 751D) for the database insta the SAP system there. | ance to be created. |
| ▲ Back Next ▶ | | | | |

RAC Installation Type needs to match RAC on Engineered Systems.

The database hostname lsadodb refers to the invocation of SPWM (./sapinst SAPINST_USE_HOSTNAME=lsadodb). This hostname is consumed by profile settings.

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| oftware Provi | sioning | | | | SAP |
| Choose Option edia Browser | 2 Define Parameters | 3 Summary | 4 Execute | Com | 5 pleted |
| ter the location of the re oftware Package Requ | equired software packages. est | | | | |
| ledium | | Package Location | | | Check Locat |
| nstallation Export | NW740 SR2 (folder EXP1) | /media/NW740 SR2 export | /DATA UNITS/EXP1 | Browse | |
| | | | | | |
| | | | | | |
| dditional Information | | | | | |
| dditional Information ne required software pa you do not want to che re prompted again to cl | ackages available on the me ck the locations of the soft heck the locations of the soft | dium are detected using the i are packages now, deselect th ware packages. | dentification files LABE te flag in the <i>Check Lo</i> i | L.ASC or LAE | BELIDX.ASC. h. Later, you |

This Installation Export EXP1 will be used as input data for R3Load during this installation step.

| SAPinst root@lsoda01: SAP NetWeaver | 7.4 Support Release 2 | > Oracle > SAP System | ns > Applicatic 🔤 🔲 🗙 |
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| Eile SAP <u>i</u> nst <u>H</u> elp | | | |
| Software Provisioning | | | SAP |
| Choose Option Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Oracle Database | | | |
| Enter the parameters of the database system. | | | |
| Database Server and Client | | | |
| Database Server Version | 121 🖺 | | |
| D <u>a</u> tabase Client Version | <mark>121</mark> | | |
| Advanced Configuration | | | |
| Estimated Database Size in GB | 22 | | |
| ' <u>M</u> axDatafileSize' in MB* | 2000 | | |
| Da <u>t</u> abase on Raw Device | | | |
| Advanced DB Configuration - For Oracle Experts On | ly 🗹 | | |
| Additional Information MaxDatafileSize depends on the value specified in 20000MB (see also F1 help). In the Advanced Confi tablespaces, file system distribution and storage. No | n the Estimated Database S guration section, you can ci ote that this section is for C | ize field and is set to 200 lange parameters for crea racle experts only. | OMB, 5000MB, 10000MB or ling the database, creating |
| Back Next F | | | |
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Advanced DB Configuration ticked. Offers various options on initial settings.

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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provisi | oning | | SAP | |
| Choose Option | 2 3 Define Parameters Summary | 4 Execute | Completed | |
| Enter the parameters of the c | latabase system. | | | |
| Attention | | | | |
| An existing database cannot | detected. | | | |
| Reuse Database | O Install MCOD (Multiple Components in One Database) Install Database (Recreate if exists): | | | |
| Sidadm User for RAC MCO | D connect | | | |
| si <u>d</u> adm or db connect user | oraado | | | |
| Length of Instance No. | ○ <u>O</u> ne Character (19) ● Thr <u>e</u> e Character (001 009) | | | |
| Database Instance RAM | | | | |
| Tot <u>a</u> l RAM [MB] | 96616 | | | |
| Instan <u>c</u> e RAM [MB] | 48308 | | | |
| Database Schemas | | | | |
| The new default for ABAP Sc As of Oracle server version 1 | hema is SAPSR3. .2.1, ABAP SSFS is set automatically. | | | |
| ABA <u>P</u> Schema* | SAPSR3 | | | |
| Pass <u>w</u> ord of ABAP Schema* | * * * * * * * | | | |
| Confirm* | * * * * * * * | | | |
| ABAP SSFS | \checkmark | | | |
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Memory values derived from host query, should be adjusted when running more than one database on the Oracle Database appliance.

Toggling between Install MCOD and / Install Database allows an editable sidadm user (adoadm vs. oraado)

| 📁 👩 SAPinst root@l | lsoda01: SAP NetWeaver 7. | 4 Support Release 2 | > Oracle > SAP System | is > Applicatic 📃 🔲 🛛 🗙 |
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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Prov | visioning | | | SAP |
| Choose Option | 2 Define Parameters Se Accounts | 3 Summary | 4 Execute | 5 Completed |
| Enter the passwords of | the standard database users. | | | |
| Oracle Database User | rs | | | |
| Eassword of sys | **** | | | |
| Password of 'system'* | **** | | | |
| Confirm* | **** | | | |
| Additional Informatic During the installation, here. | D n standard Oracle database user | rs are created. The pass | words of these users are so | et to the values you enter |
| ▲ Back Next ▶ | | | | |
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| <u>E</u> ile SAP <u>i</u> nst <u>H</u> elp |) | | | |
| Software P | rovisioning | | | SAP |
| Choose Option | Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Enter the listener na | ame, port and domain. | | | |
| Attention | | | | |
| We recommend that you have more that If you decide to ke instead of replacing | at you do not change the default va n one Oracle database on this insta ep the entries in an existing networ g the file. | lues for <i>Listener</i> and <i>List</i> Ilation host. In this case, k configuration file, SAPir | <i>ener Port.</i> You may change see SAP Note <u>98252</u>. hst will merge the new entri | these default values only if es into the existing file |
| Oracle Listener C | onfiguration | | | |
| <u>L</u> istener* | LISTENER | | | |
| Li <u>s</u> tener Port* | 1521 | | | |
| <u>D</u> omain* | WORLD | | | |
| NetWork Configu | ration Files | | | |
| <u>K</u> eep listener.ora | \checkmark | | | |
| K <u>e</u> ep tnsnames.ora | a 🖌 | | | |
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| <u>Eile SAPinst H</u> elp | | | |
| Software Provisioning | | | SAP |
| Choose Option Define Parameters | 3 Summary | 4 Execute | 5 Completed |
| Oracle Database | | | |
| Enter the parameters of the database GRID environm | ient. | | |
| | | | |
| Database Instance | | | |
| ORACLE_HOME for GRID /u01/app/12.1 | .0.2/grid | | Browse |
| ORACLE_SID for GRID* +ASM1 | | | |
| Or <u>a</u> cle GRID Software Not Installed 🗌 | | | |
| Additional Information Make sure that operating system user or acite below | as to aroun saninst other | wise the available disk on | ouns cannot be selected |
| | go to group papinot, other | inite the dranable close give | |
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Before you press "Next" ensure that the OS user oracle is a member of the OS group sapinst. For example, on a unix shell: id oracle shall return sapinst as well. Do not continue if this criteria is not met.

Also, provide correct path for ORACLE_HOME and ORACLE_SID for Oracle Grid Infrastructure.

| SAPinst root@lsoda01: SAP NetWeaver 7.4 Su Eile SAPinst Help | pport Release 2 > Oracle > SAP | Systems > Applicatic 📃 🔲 🗙 |
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| Software Provisioning | | SAP |
| Choose Option Define Parameters Oracle ASM Disk Group | 3 4 Summary Execute | Completed |
| Enter the available ASM disk groups – for Oracle exports only | Y | |
| ASM Disk Group Configuration | | |
| Default ASM Disk Group for +DATA +DATA | | E |
| Default ASM Disk Group for +RECO | | E |
| Default ASM Disk Group for + ARCH +RECO | | ۵. |
| Parameter compatible in init.ora 12.1.0.2.0 | | E |
| ASM Diskgroup Information | | |
| DiskGroup | Freespace in MB | Compatibility |
| +RECO | 1697988 | 11.2.0.2.0 |
| +REDO | 46533 | 11.2.0.2.0 |
| Add Remove | | |
| Bark Max | | |

Parameter "compatible" in init.ora refers to the Oracle RAC instances compatible settings – RDBMS runtime settings. Compatible controls feature availability on the highest level. We have to adjust this value becoming 12.1.0.2.0.

Diskgroup compatibility refers to Oracle ASM and means here that it's permitted to operate database software down to Oracle Database 11.2.0.2.0, if not being on Oracle Database Appliance X5-2.

Note: X5-2 deployments MUST have a diskgroup compatibility of 12.1.0.2.0.

| 🝯 👩 SAPinst root@lsod | a01: SAP NetWeaver 7.4 | Support Release 2 | > Oracle > SAP Systems | > Applicatic 📃 🗖 🗙 |
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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provis | ioning | | | SAP |
| Choose Option | Define Parameters | 3 Summary | 4 Execute | Completed |
| Ofacte Database i | RAC Farameters | | | |
| Enter the parameters of the | database RAC – for Oracle e | xperts only. | | |
| | | | | |
| Database RAC Parameters | 5 | | | |
| <u>D</u> atabase Name | ADO | | | |
| N <u>u</u> mber of Instances | 2 | | | |
| <u>S</u> can Listener* | 1soda-scan | | | |
| S <u>c</u> an Listener Port | 1521 | | | |
| Length of Instance Number | O <u>O</u> ne Character (1 9) ◉ <u>T</u> hree Characters (001 . | 009) | | |
| Additional Information | database instances. The value | us chauld be between | 2 and 0. The default is 2 | |
| Enter the number of Oracle | uatapase instances. The val | de snouid be between | z anu 9. The default is 2. | |
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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> e | lp | | | | | |
| Software F | Provisioni | ng | | | | SAP |
| Choose Opti | on Def | 2 ine Parameter | s Summary | y Exect | ite Comp | 5 🗖 🗖 |
| Oracle Data | ibase RAC | Paramete | ers | | | |
| Enter the paramet Database Param | ers of the datab eters | ase RAC – for (| Dracle experts only. | | | |
| <u>P</u> arameters for O | racle RAC | | | | | |
| Host | Grid SID | Instance No. | Service Name | Undo Tablespace | DiskGroup Undo Ta | Size in MB |
| 1soda01 | +ASM1 | 001 | ADO, ADO001 | PSAPUND0001 | +DATA 🔳 | 700 |
| 1soda02 | +ASM2 | 002 | ADO, AD0002 | PSAPUND0002 | +DATA 🛅 | 700 |
| Ini <u>t</u> ,ora RAC Para | meters | | | | | |
| Parameter | | | | Value | | |
| ADUUU1.local_I | 1stener | | | Isoda1-V1p:1521 (#D0#D0001) | | |
| AD0001.service | e number | | | (ADO, ADOODI) AA2 | | |
| AD0002.thread | | | | 002 | | |
| AD0002.instanc | e_name | | | AD0002 | | |
| AD0002.undo_ta | blespace | | | PSAPUND0002 | | |
| AD0002.1oca1_1 | istener | | | lsoda2-vip:1521 | | |
| ADU002.service | _names | | | (ADU, ADU002) | | |
| Add Rem | ove | | | | | |
| Additional Infor | mation | | | | | |
| Modify all @& nar: | ameters (Host) | | | | | |
| Do not change p | arameter <i>cluster</i> | _ <i>database.</i> It is | ; set automatically. | | | |
| ▲ Back Next ▶ |] | | | | | |

Adjust hostnames at the upper screen section as indicated by SWPM.

At the bottom screen section change local_listener parameters for both Oracle instances towards:

ADO001.local_listener = lsoda1-vip:1521 ADO002.local_listener = lsoda2-vip:1521

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| <u>Eile SAPinst H</u> elp | | | | |
| Software Provision | ing | | | SAP |
| Choose Option De | 2 fine Parameters | 3 Summary | 4 Execute | 5 Completed |
| Advanced Oracle Co | nfiguration | | | |
| Enter the general check paramete | ers – for Oracle expe | rts only. | | |
| | | | | |
| Advanced Configuration Enabl | lement | | | |
| Select what you want to configure | e in advance: | | | |
| Create Database Parameters | | | | |
| <u>C</u> reate Database | v | | | |
| Control Files | ¥ | | | |
| Tablespace Parameters | | | | |
| Create Tablespaces | ¥ | | | |
| <u>A</u> utoextent | ¥ | | | |
| <u>G</u> eneral Storage | ¥ | | | |
| Default Storage | ¥ | | | |
| Extent Management | ¥ | | | |
| Compress Tablespaces | | | | |
| Policy Tablespaces | v | | | |
| B <u>W</u> Policy Tablespaces | | | | |
| InitOra Parameters | | | | |
| Change / Add ini <u>t</u> .ora Parameter | Image: A start of the start of | | | |
| Addtional Paramters | | | | |
| Window <u>s</u> Drives | | | | |
| Sapdata Directory Mapping | v | | | |
| Database Instance Fi <u>l</u> e Systems | Image: A start of the start of | | | |
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| Back Next Next | | | | |
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You may tick less options depending on your deployment scenario.

init.ora Parameter discussion is covered later in this whitepaper.

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| <u>F</u> ile SAP <u>i</u> nst <u>H</u> elp | | | | |
| Software Provis | ioning | | | SAP |
| Choose Option | 2 Define Parameters | 3 Summary | 4 Execute | Completed |
| File System of the | oracle Databas | se Instance | | |
| Specify the database instanc | e directories. | | | |
| | | | | |
| Database Instance File Sy | stems | | | |
| \$ <u>O</u> RACLE_HOME Directory | /oracle/ADO/121 | | | Browse |
| O <u>r</u> acle Stage Directory | /oracle/stage/121 | | | Browse |
| Sapdata Home Directory | /oracle/ADO | | | Browse |
| Additional information The \$0RACLE_HOME Direct /oracle/ <dbsid>/<versit start the database software</versit </dbsid> | tory is the location where tony is the location where 5 on>_ <bit>. The Oracle 5t installation. The default I</bit> | the database software is ir age Directory is the locatio ocation for the Oracle Stag | istalled. The default value n to which the Oracle stag <i>ie Directory</i> is /oracle/st | for \$ORACLE_HOME is e is extracted before you age/ <version>_<bit>.</bit></version> |
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| Eile SAPinst Help | | | |
| | | | |
| Software Provisioning | | SAP | |
| Choose Option Define Parameters Sur | 3 mary Exe | t 5 cute Completed | |
| Oracle Database Destination | | | |
| oracle Database Destination | | | |
| Enter the parameters of the sapdata directory distribution. | | | |
| | | | |
| | | | |
| Database Directories | | | |
| Oracle Sapdata Directories | | | |
| Sapdata Key | ASM Data Path | | |
| SAPDATA1 | +DATA | 1 | |
| SAPDATA2 | +DATA | 1 | |
| SAPDATA3 | +DATA | Ē | |
| SAPDATA4 | +DATA | Ē | |
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| Add Remove | | | |
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| Software Provisioning | | | SAP |
| Choose Option Define Parameter | eters Summary | 4 Execute | 5 Completed |
| Oracle Database Instance | | | |
| Enter the database instance-specific informat | tion – for Oracle experts only. | | |
| Create Database Parameters | | | |
| <u>M</u> axLogFiles* | 255 | | |
| M <u>a</u> xLogMembers* | 3 | | |
| Ma <u>x</u> LogHistory* | 1000 | | |
| <u>D</u> B Character Set | UTF8 🔳 | | |
| Maxin <u>s</u> tances* | 50 | | |
| MaxDa <u>t</u> aFiles* | 1000 | | |
| Max <u>C</u> ontrolFileSize* | 20 | | |
| <u>R</u> euse Control Files | \checkmark | | |
| Redo Log File Configuration | | | |
| We strongly recommend that you enable the are recreating a database, rather than creat | Mirror Redo Log Files option. Norma ing one for the first time. | Illy you use the Reuse Conti | rol Files option only if you |
| ASM Directory for Redologs | +DATA | | |
| Number of Redo Log Groups | 5 | | |
| Size of Redo Log Files [MB] | 8192 | | |
| Reuse Red <u>o</u> Log Files | \checkmark | | |
| Mirror Redo Log Files | | | |
| Path to Mirror Redo Log Files | | | |
| ASM Directory for 2nd Member of RedoLogs | +DATA | | 1 |
| | | | |
| Back Next | | | |
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It is suggested not to tick "Mirror Redo Log Files". We keep redo logs in the +REDO ASM diskgroup on SSDs with 3way mirroring each. Mirroring them against +DATA diskgroup at the same time would impact runtime performance.

In this dialog we changed also the amount of redo log groups to 5 and their size from 4GB each towards 8GB (formula for diskgroup size is: diskgroupsize [MB] > number of redo log group x size of a single redo log file [MB]).

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| Software Provisioning | g | | | SAP |
| Choose Option Define Oracle Control Files Enter the control file location – for Orac | Parameters Sum | 3 Imary | 4 Execute | 5 Completed |
| Tablespace Definition Oracle Control Files | | | | |
| ADO | +RECO | <u> </u> | ondornervane ADO/entr1ADO.dbf ADO/entr1ADO.dbf | |
| | | | | |
| Add Remove | | | | |

2 logical controlfiles, each of them is 3-way mirrored at ASM level.

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|-----------------------------------------------|-------------------------------------------------------------------|---|
| <u>File SAPinst H</u> elp | | |
| | | |
| Software Provisioning | SAP | |
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| | | |
| ▶ | 3 4 5 | - |
| Choose Option Define Paramet | rs Summary Execute Completed | |
| Oracle Tablespaces | | |
| | | |
| Enter the general tablespace parameters – for | Dracle experts only. | |
| | | |
| | | |
| Tablespace Definition | | |
| <u>O</u> racle Tablespaces | | |
| Tablespace | Size [MB] Sapdata Directory | |
| PSAPSR3 | 2000 SAPDATA2 | 1 |
| PSAPSR3 | 2000 SAPDATA2 | 1 |
| PSAPSR3 | 2000 SAPDATA2 | |
| PSAPSR3 | 2000 SAPDATA2 | 1 |
| PSAPSR3 | 2000 SAPDATA2 | 1 |
| PSAPSR3 | 1540 SAPDATA2 | 1 |
| PSAPSR3740 | 2000 SAPDATA3 | 1 |
| PSAPSR3740 | 1010 SAPDATA3 | |
| PSAPSR3USR | 20 SAPDATA4 | 1 |
| PSAPUNDO | 700 SAPDATA1 | 1 |
| PSAPTEMP | 350 SAPDATA1 | 1 |
| SYSTEM | 350 SAPDATA1 | 1 |
| SYSAUX | 200 SAPDATA1 | 1 |
| PSAPUND0001 | 700 SAPDATA1 | 1 |
| PSAPUND0002 | 700 SAPDATA1 | 1 |
| | | |
| | | |
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| Add Kemove | | |
| T Parts March | | |
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| Software Pro | visioning | | | | S | 4 |
|----------------------------------------------------|-----------------------------------|------------|----------------------|----------------|-------------|---|
| Choose Option | 2 Define Parameters | | 3 Summary | 4 Execute | Completed | |
| ablespace Ex | tensions | | | | | |
| | | | | | | |
| iter the autoextent ci | onfiguration of the tablespaces - | - for C | Dracle experts only. | | | |
| | | | | | | |
| ablespace Extensio | ns Definition | | | | | |
| racle Tablespace Ex | tension | | | | | |
| FblspName | Autoextent | | AutoExtNextSize | AutoExtMaxSize | AutoExtUnit | |
| SAPSR3 | ON | 1 | 20 | 10000 | M | |
| SAPSR3 | ON | 1 | 20 | 10000 | M | |
| SAPSR3 | ON | 1 | 20 | 10000 | M | |
| SAPSR3 | ON | 1 | 20 | 10000 | M | |
| SAPSR3 | ON | 1 | 20 | 10000 | M | |
| SAPSR3 | ON | 1 | 20 | 10000 | M | |
| SAPSR3740 | ON | 1 | 20 | 10000 | M | |
| SAPSR3740 | ON | 1 | 20 | 10000 | M | |
| SAPSR3740 | ON | 1 | 20 | 10000 | M | |
| SAPSR3740 | ON | 1 | 20 | 10000 | M | |
| SAPSR3740 | ON | 1 | 20 | 10000 | M | |
| SAPSR3USR | ON | 1 | 20 | 10000 | M | |
| enn enreeen | ON | 1 | 20 | 10000 | M | |
| SAPUNDO | | E 1 | 20 | 10000 | M | |
| SAPUNDO SAPTEMP | UN | | | 10000 | м | |
| SAPUNDO SAPTEMP YSTEM | ON | | 20 | 10000 | | |
| SAPUNDO SAPTEMP YSTEM YSAUX | ON ON | | 20 20 | 10000 | M | |
| SAPUNDO SAPTEMP YSTEM YSAUX SAPUNDO001 | ON ON ON ON | | 20 20 20 | 10000 32700 | M | |

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| ł | Software Provisioning | | | | | | | | | |
| ► (| 1 2 3 4 5 Choose Option Define Parameters Summary Execute Completed General Tablespace Storage Enter the general storage parameters of the tablespaces – for Oracle experts only. | | | | | | | | | |
| - | Tablespace Storag Oracle General Stora | e Definitior age | 1 | | | | | | | |
| | TbispName | MinExtent | Unit | Log Mode | | TblspStatus | | TblspType | SegmentSpaceM | gmt |
| | PSAPSR3 | 1 | M E | LOGGING | | ONLINE | | PERMANENT 🛅 | AUTO | |
| | PSAPSR3740 | 1 | M E | LOGGING | | ONLINE | | PERMANENT 🛅 | AUTO | |
| | PSAPSR3USR | 1 | M E | LOGGING | | ONLINE | | PERMANENT 🛅 | AUTO | |
| | PSAPUNDO | 1 | M 🗉 | LOGGING | | ONLINE | ۵ | PERMANENT 🛅 | AUTO | |
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| | PSAPUND0001 | 1 | M 🔳 | LOGGING | | ONLINE | | PERMANENT | AUTO | |
| | PSAPUND0002 | 1 | M 🔳 | LOGGING | | ONLINE | | PERMANENT 🛅 | AUTO | |
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| PSAPSR3 | NOPOLICY | 1 | 40 |
| PSAPSR3740 | NOPOLICY | 1 | 40 |
| Additional Information In Oracle Database 12c, new Inform option. Here you can select a row-le modifications for x days. You can select the following policy or DEFAULT ILM ADD POLICY ROW STO | ation Lifecycle Management (ILM) features h vel policy on tablespace level using Advanc • nopolicy. RE COMPRESS ADVANCED ROW AFTER <x></x> | ave been added to the Ac ed Row Compression after DAYS OF NO MODIFICATI | dvanced Compression r there have been no ON. |
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| Enter the ILM policy para | ameters of the BW-tablespaces | 5 – for (| Oracle experts on | y. | | |
| ILM Policy BW Tables | oace Parameters | | | | | |
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| # | ###################################### |
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| # | # e(#) @10. //INSC/INSC_SCITECS/THCS/OO/_REL/CP |
| * shared nool size | 13676744540 |
| open cursors | 2000 |
| # | # processes = ABAP-Workprozesse * 2 + J2EE-Serv |
| # | # <max-connections> + PARALLEL MAX SERVERS + 40</max-connections> |
| processes | 350 |
| # | # session = 2 * processes |
| sessions | 700 |
| db_name | ADO |
| db_block_size | 8192 |
| # | # retention time for RMAN backup information in |
| control_file_record_keep_time | 30 |
| log_checkpoints_to_alert | true |
| compatible | 12.1.0.2.0 |
| parallel_execution_message_size | 16384 |
| query_rewrite_enabled | false |
| replication_dependency_tracking | false |
| star_transformation_enabled | true |
| log_archive_dest_1 | 'LOCATION=+RECO/ADO/oraarch' |
| Add Remove | |

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| Choose Option Define Parameters Summary Execute | 5 Completed |
| Declustering / Depooling Option | |
| Enable table declustering / depooling for your SAP system to implement the new SAP standard for the databa | se table layout. |
| ABAP Table Declustering and Depooling | |
| Enable declustering/depooling of all ABAP tables Do not decluster/depool ABAP tables | |
| Additional Information | |
| The new SAP standard for the database table layout is implemented by default for SAP products based on S. higher. The implementation is optional for SAP products based on SAP NetWeaver 740. | AP NetWeaver 750 and |
| Table declustering / depooling converts SAP cluster and pool tables to transparent database tables. | |
| Select Enable declustering/depooling of all ABAP tables if you want to decluster / depool all ABAP tables in y compensate for the increased space consumption of your declustered / depooled SAP system, we recommendatabase compression features as described in <u>SAP Note 1892354</u> . | our target system. To nd that you activate |
| Select Do not decluster / depool ABAP tables in the following cases: | |
| You want to install the target system without using declustering / depooling. The table types of your target system should be the same as in the source system. | |
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| Choose Option Define Parameters SAP System Database Import Enter the general load parameters. | 3 Summary | 4 Execute | Completed |
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| we recommend that you configure only a maximum of 2 | -s paranei ksituau pr | ocesses per CPO. | |
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| Create Database | Statistics | | | |
| Specify whether you want t | he statistics to be created a | utomatically after the imp | port ends. | |
| Database Statistics | | | | |
| Create Statistics for ABAP | ● Yes ○ N <u>o</u> | | | |
| <u>P</u> rogram Call for ABAP | brconnect -u / -c -o s | ummary -f stats -o S | GAPSR3 -t all -p 8 | |
| If you skip the creation of | database statistics, your da | tabase may run with red | luced performance. | |
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| nter the location of the required softwar | e packages. | | | |
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| oftware Package Request | | | | |
| Medium | | Package Location | | |
| Oracle Client 121 | | /media/Oracle_client_12 | | Browse |
| | | | | |
| Additional Information The required software packages availab If there is a complete medium available in the Package Location column. | le on the medium are dete on the installation host, you | cted using the identification file only need to enter the path to | es LABEL.ASC or LABELI the root directory of the | DX.ASC. e medium |
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| Choose to the so | 'Next' to start with the values shown. Otherwise, select the creen where you can change the parameter. You might be | e parameters to be changed and choose 'Revise'. You a guided through other screens that have so far been p | are then taken rocessed. |
| Parame G G Pr M D D D | eter list eneral SAP System Parameters Profiles Available rofile Directory /sapmnt/AD0/prof11e asseverd for All Users ***** NS Domain Name Set FQDN for SAP system oftware Package | | • |
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| Choose Option Task Progress Running phase: Create data | 2 Define Parameters base | 3 Summary | Execute | Completed |
| Phase 10 of 23 | stem | - | | |
| Install common system Unpack SAP archives Create and load database Install/Check database Evaluate d Create and Install Oracle client soft Configure Oracle server Prepare database served Create database Create database Create database Create Account installation Update database in RA Check Oracle NLS_CHAI Adapt database schem Check Oracle patch Install DBA tools Create ABAP secure sto Import ABAP Perform Oracle post-load acthi Perform Oracle post-load | files oad database ware network er configuration ces ion C environment RACTERSET a re dities ad activities ics | | | |



Database installation complete at this point.

Post SWPM Installation Steps

/etc/oratab adjustments

Verify the environment for your new database on each node, check the file /etc/oratab, on both nodes it should should read like below. The syntax is <db_unique_name>:<oracle home directory>:startup on host boot (Y vs N).

ADO:/oracle/ADO/121:N

Setup orabtt - Ora BaseTabTool

Navigate to SAP Note 1521371, download OraBaseTabTool, and run it.

Copy init<SID>.ora file to remote host

SWPM runs only on one node; hence we have to copy some files from the installation node to the second node. SWPM already created the necessary files. Say on node 1 we refer to initADO001.ora file then we need to refer to initADO002.ora on node 2. This init<ORACLE_SID>.ora file essentially contains a pointer to the stored parameter file (*spfile*) in Oracle ASM.

Login to installation node as oracle, change to directory <ORACLE_HOME>/dbs

scp initAD00002.ora <node2>:/<ORACLE HOME>/dbs/initAD00002.ora

Verify correct database parameter settings, and correct if needed

Download and execute the parameter_check_12 script from SAP Note 1171650. Those settings shall reflect recommended values from SAP Note 1888485 Database Parameter for 12.1.0.2.

\$ sqlplus "/ as sysdba"

SQL*Plus> @parameter_check_12.txt

Aside of the recommendations of above script ensure following parametrization is effective:

_enable_NUMA_support = FALSE _file_size_increase_increment= 2044M _disable_interface_checking = TRUE _gc_undo_affinity = FALSE _gc_policy_time = 0 db_block_checksum = "FULL" db_block_checking = "FULL" db_lost_write_protect = "TYPICAL" db_create_file_dest = "+DATA" db_create_online_log_dest_1= "+REDO"

Also, correct local_listener settings, e.g. from sqlplus level and verify them instance by instance:

```
alter system set local_listener="(ADDRESS = (PROTOCOL=TCP) (HOST=lsodal-
vip)(PORT=1521))" SID='ADO001' scope=both;
alter system set local_listener="(ADDRESS = (PROTOCOL=TCP) (HOST=lsoda2-
vip)(PORT=1521))" SID='ADO002' scope=both;
show parameters local listener
```

Database Service scripts on PAS / subsequent Application Server instance(s)

When installing SAP Primary Application Server (PAS) and further Application Server instances which require a database service which hasn't been deployed yet SWPM halts it's activities until you confirm having both copied and ran a generated script for the database service. This script needs to be executed in the database environment. Once

completed SWPM can resume installation of the SAP Application Server Instance installation. The script generates following additional service as a cluster resource:

STABLE

ora.ado.ado_dvebmgs00.svc 1 ONLINE ONLINE lsoda01

Clean up install space - TMP

SWPM generates significant footprint in /usr/sap/tmp. It's advisable to pack and transfer this content towards an alternative storage location. Once unpacking and crosschecking at the alternate storage location it's fine to clean up /usr/sap/tmp.

SAP PAS, subsequent Application Servers require uuid and uuidd packages

Ensure you meet SAP Application Server Operation System requirements. In case of packages unid and unidd are not installed on Oracle Linux 6 environments, please add them, plus starting the unidd demon. Also make sure unidd is checked for startup at OS startup (matching all runlevels that SAP application server starts at). See also SAP Note 1635808.

Virtual host names for SAP PAS and subsequent SAP Application Servers

For high availability reasons, say you run SAP Primary Application Server Instance or, subsequent SAP Application Server Instances in an HA capable environment (such as Oracle Cluster Ready Services), install them on virtual hostnames outside of the Oracle Database Appliance. Invoke SPWM by ./sapinst SAPINST_USE_HOSTNAME=<virtual_host_name> to do so.

Complete the HA awareness for ASCS and ERS instances

ASCS Instance and ERS instance require own VIPs. Follow SAP Note 1496927 Protection of SAP instances through Oracle Clusterware – use the v8.1 from the download section. Our scenario uses 10.20.88.62 and 10.20.88.64 as VIPs for ASCS and ERS, respectively. The sapctl create command create the necessary CRS resources including their dependencies on an ora.net2.network. It is noteworthy to mention to correct the invidual instance profiles from "Restart_Program_00" towards "Start_Program_00".

[root@lsoda01]# ./sapctl create -sapsid ADO -if bond0 -nm 255.255.252.0 -net 10.20.88.0 -nodes lsoda01,lsoda02 -abapenq ASCS00 -abapvip 10.20.88.62 -abapmsport 3600 -abaprep ERS10 -aersvip 10.20.88.64

[root@lsoda01]# ./sapctl start all -sapsid ADO
sapctl version 8.1 Patch 0 Production Copyright 2016 Oracle. All rights reserved
Starting SAP ABAP Enqueue service
Starting SAP ABAP Replication service

The CRS output of the additional resources created and running is listed in Appendix B.

Verify environment for user oraado

Login to each of the nodes as oraado, and env | grep ORACLE.

This should read as:

ORACLE_SID=ADO ORACLE_HOME=/oracle/ADO/121 ORACLE_BASE=/oracle/ADO If this is not correct, check in the environment scripts which are the correct ones. Before you move files around, please backup them. .dbenv_<hostname>.<shellname> takes precedence over the files without hostname.

SAP Database Administration with BR*Tools

The installation and configuration of BR*Tools is done by the above described Database Instance step of SWPM and installs BR*Tools 7.40 Patch 12. Usage of BR*Tools on Oracle Database Appliance to manage the Oracle database for SAP is supported. SAP Note 2087004 instructs that full support is provided with BR*Tools 7.40 Patch 14. Further information on BR*Tools can be found in SAP Notes 2087004,1598594 and 1627541.

Lifecycle Management for SAP Databases

An Oracle Database Appliance requires regular patching at several levels of its software stack:

- » Oracle RDBMS software
- » Oracle Grid Infrastructure software
- » Oracle Appliance Kit (OAK) software
- » Operating system and firmware

This section describes how to install patches for the above components of an Oracle Database Appliance running databases for SAP applications. For more general information on the Oracle Database Appliance components and patches refer to My Oracle Support Note 888888.1 ("Oracle Database Appliance – 12.1.2 and 2.x Supported ODA Versions & Known Issues").

An Oracle Database Appliance requires the following patches and bundle patches for a complete update (with the mentioned patch versions current at the time of this write-up):

- » Oracle Database Appliance Bundle Patch 12.1.2.6.0
- » Oracle Database SAP Bundle Patch 12.1.2.0.2.160119 201602 for Oracle Database Appliance

Oracle tests and certifies these patches and their successors for SAP databases on a regular basis and makes them available for SAP customers on My Oracle Support and the SAP Service Marketplace. You can find up-to-date release information on the patches and their download locations in SAP Note 2145651 ("Oracle Database Appliance: Patches for 12.1.0.2").

Note: Each SAP Bundle Patch for the Oracle Database Appliance is certified for exactly one particular Oracle Database Appliance version.

Hence you cannot combine SAP Bundle Patches and Oracle Database Appliance versions that are not certified to operate together. See SAP Note 2145651 for information on certified combinations of SAP Bundle Patches for ODA and Oracle Database Appliance versions.

In a nutshell, install the above mentioned patches in the following order:

- 1. Refer to SAP Note 2145651 to determine the required patches and their download locations.
- 2. Download the Oracle Database Appliance Bundle Patch and install its operating system and firmware patches.
- 3. Download and install the SAP Bundle Patch for ODA.

Note: Do <u>not</u> install the Grid Infrastructure patches and the RDBMS patches from the Oracle Database Appliance Bundle Patch.

Instead, apply these via the SAP Bundle Patch for the Oracle Database Appliance.

Installation of the Operating System and Firmware Patches

To install the operating system and firmware patches perform the following steps:

- 1. Download the Oracle Database Appliance Bundle Patch to both Oracle Database Appliance nodes
- 2. On both Oracle Database Appliance nodes, verify your current Oracle Database Appliance version:

/opt/oracle/oak/bin/oakcli show version

3. On both Oracle Database Appliance nodes, unpack the Oracle Database Appliance Bundle Patch:

/opt/oracle/oak/bin/oakcli unpack -package <absolute path to ODA bundle patch>

4. On the first Oracle Database Appliance node, start installation of the operating system and firmware patches of the Oracle Database Appliance Bundle Patch. The <code>oakcli</code> utility installs the patches automatically on both nodes.

/opt/oracle/oak/bin/oakcli update -patch <version_of_ODA_bundle_patch> \
--server

Depending on which components of the Oracle Database Appliance are getting updated this command may reboot the nodes.

See section "Patching the Infrastructure Components" in the Readme of the Oracle Database Appliance Bundle Patch for complete information on the installation of its operating system and firmware patches.

Note: Do <u>not</u> install the Grid Infrastructure patches and the RDBMS patches from the Oracle Database Appliance Bundle Patch.

Install them as described in the next section from the SAP Bundle Patch for Oracle Database Appliance instead.

Note: Installation of the Oracle Database Appliance Bundle Patch and the SAP Bundle Patch for Oracle Database Appliance is <u>not</u> RAC-rolling.

Installation of the SAP Bundle Patch for the Oracle Database Appliance

Ensure that the operating system environment requirements are met on both Oracle Database Appliance nodes as described in section "Operating System Environment Requirements" of the SAP Bundle Patch Readme.

Then follow the instructions from section "SAP Bundle Patch Installation" to install the SAP Bundle Patch for the Oracle Database Appliance. This usually comprises:

- 1. Installation of the latest OPatch and MOPatch utilities (self-contained)
- 2. Installation of the Grid Infrastructure patches in the GI homes.
- 3. Installation of the RDBMS patches in the RDBMS homes.
- 4. Execution of post-installation instructions, most notably of the catsbp.sql script, plus setting the updated RDBMS event triggers and fix_control settings

Note: Installation of the Oracle Database Appliance Bundle Patch and the SAP Bundle Patch for Oracle Database Appliance is <u>not</u> RAC-rolling.

Documentation References

[1] Oracle Database Appliance Documentation

http://www.oracle.com/technetwork/server-storage/engineered-systems/database-appliance/documentation/index.html

[2] Upgrade of SAP NetWeaver installation to Oracle Grid Infrastructure 12.1.0.2 and Oracle Real Application Clusters 12c Release 1

http://scn.sap.com/community/oracle

[3] Providing High Availability for SAP Resources with Oracle Clusterware 11g Release 2 and Clusterware 12c Release 1

http://scn.sap.com/community/oracle

[4] Relevant SAP Notes, Oracle Notes

SAP Notes

| SAP Notes | SAP Related Notes |
|-----------|----------------------------------------------------------------------|
| 2290084 | SAP Software and Oracle Database Appliance Version 12.1 |
| 1760737 | SAP Software and Oracle Database Appliance Versions 2.x (ODA) |
| 1877857 | Installation and Configuration of SAP HA ASCS/ERS on ODA |
| 2133079 | Oracle Database 12c Integration in SAP Environment |
| 527843 | Oracle RAC support in the SAP environment |
| 1677978 | Mixed GI/RDBMS Versions or Mixed SAP/Non-SAP Environments on Exadata |
| 1888485 | Database Parameters for 12.1.0.2 |
| 2087004 | BR*Tools Support for Oracle 12c |
| 2145651 | Oracle Database Appliance: Patches for 12.1.0.2 |
| 1825328 | Oracle ASM and NW MDM |
| 1914631 | Oracle 12c: Central Technical Note for Oracle 12c |
| 1496927 | Protection of SAP instances through Oracle Clusterware |
| 2157904 | Oracle 12c: Conversion of compressed tables |
| 819829 | Oracle Instant Client Installation and Configuration on Unix |
| 1171650 | Automated Oracle DB parameter check |
| 1680045 | Release Note for Software Provisioning manager 1.0 SP10 |
| 1627541 | BR*Tools support for Oracle ASM and Exadata/ODA |
| 1635808 | Oracle Linux 6.x SAP Installation and Upgrade |
| 1521371 | Setting of ORACLE_BASE in SAP environments |

ORACLE NOTES

| Oracle Note | Oracle MOS Note Title |
|-------------|----------------------------------------------------------------------------------|
| 888888.1 | Oracle Database Appliance - 12.1.2 and 2.X Supported ODA Versions & Known Issues |
| 1409835.1 | ODA (Oracle Database Appliance): Deployment & Cleanup Steps |
| 1934030.1 | ODA (Oracle Database Appliance): HowTo export ACFS (cloudfs) using HANFS |
| 337737.1 | Oracle Clusterware (CRS/GI) - ASM - Database Version Compatibility |

Appendix A – crsctl output after a fresh deployment

crsctl stat res -t

| Name Target | State | Server | State details |
|------------------------|--------|---------|------------------------------------------|
| Local Resources | | | |
| ora.ASMNET1LSNR ASM.ls | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.ASMNET2LSNR ASM.ls | nr | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.DATA.dg | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.LISTENER.lsnr | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.RECO.ACFSVOL.advm | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.RECO.DATAFSVOL.adv | rm | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | Volume device /dev/a |
| | | | sm/datafsvol-511 is |
| | | | online, STABLE |
| ora.RECO.dg | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.REDO.dg | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.net1.network | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.ons | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.proxy_advm | | | |
| ONLINE | ONLINE | lsoda01 | STABLE |
| ONLINE | ONLINE | lsoda02 | STABLE |
| ora.reco.acfsvol.acfs | | | |
| ONLINE | ONLINE | lsoda01 | <pre>mounted on /sapmnt,S TABLE</pre> |
| ONLINE | ONLINE | lsoda02 | <pre>mounted on /sapmnt,S TABLE</pre> |
| ora.reco.datafsvol.acf | s | | |
| ONLINE | ONLINE | lsoda01 | <pre>mounted on /odadataf s,STABLE</pre> |
| ONLINE | ONLINE | lsoda02 | mounted on /odadataf |

| cluster Resourc | ces | | | | | |
|-----------------|---------------|--------|---------|----------------------------|--|--|
| ora.LISTENER S | CAN1.lsn: | r | | | | |
| 1 - | ONLINE | ONLINE | lsoda02 | STABLE | | |
| ora.LISTENER S | CAN2.lsn: | r | | | | |
| 1 – | ONLINE | ONLINE | lsoda01 | STABLE | | |
| ora.MGMTLSNR | | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | 169.254.107.203,STAB LE | | |
| ora.asm | | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | Started,STABLE | | |
| 2 | ONLINE | ONLINE | lsoda02 | Started,STABLE | | |
| ora.cvu | | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | | |
| ora.lsoda01.vi | þ | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | | |
| ora.lsoda02.vij | p | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | | |
| ora.mgmtdb | | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | Open,STABLE | | |
| ora.oc4j | | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | | |
| ora.scan1.vip | | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | | |
| ora.scan2.vip | ora.scan2.vip | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | | |

Appendix B - Additional Local + Cluster Resources after HA awareness

Local:

| ora.net2.netw | ork | | | |
|--------------------------|-----------|--------|---------|--------|
| | ONLINE | ONLINE | lsoda01 | STABLE |
| | ONLINE | ONLINE | lsoda02 | STABLE |
| Cluster: | | | | |
| sap.ADO.ASCS0 | 0.abapenq | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE |
| <pre>sap.ADO.ASCS0</pre> | 0.startsr | v | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE |
| <pre>sap.ADO.ERS10</pre> | .abaprep | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE |
| <pre>sap.ADO.ERS10</pre> | .startsrv | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE |
| sap.ADO.abapv | ip | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE |
| sap.ADO.aersv | ip | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE |

Appendix C – Full CRS output after configuration

| Local Resources | Name Tar | get | State | Server | State details | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------|--------|---------|----------------------|--|
| ora.ASMNETILENR_ASM.Isnr ONLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda02 STABLE ORA.ASMNET2LSNR_ASM.Isnr ONLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda02 STABLE ONLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda01 STABLE ORA.LISTEMER.ISNT ONLINE ONLINE 1soda01 STABLE ORA.LISTEMER.ONLINE 1soda01 STABLE ORA.LISTEMER.ONLINE 1soda01 STABLE ORA.LISTEMER.ONLINE 1soda01 Volume device /dev/a sm/acfsvol-86 is online, STABLE ONLINE ONLINE 1soda01 Volume device /dev/a sm/acfsvol-86 is online, STABLE ONLINE ONLINE 1soda01 Volume device /dev/a sm/acfsvol-86 is online, STABLE ORA.RECO.DATAFSVOL.advm ONLINE ONLINE 1soda01 Volume device /dev/a sm/datafsvol-86 is on ine, STABLE ONLINE ONLINE 1soda01 Volume device /dev/a sm/datafsvol-86 is on nine, STABLE ONLINE ONLINE 1soda01 Volume device /dev/a sm/datafsvol-86 is on nine, STABLE ONLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda01 STABLE ora.RECO.dg ora.RECO.dg ONLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda02 STABLE ORLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda02 STABLE ORLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda02 STABLE ORLINE ONLINE 1soda01 STABLE ONLINE ONLINE 1soda02 STABLE | Local Resources | | | | | |
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| ONLINEIsoda02STABLEora.ASMNETZLSNR_ASM.ISIT | ONL | INE | ONLINE | lsoda01 | STABLE | |
| ora.ASMNET2LSNR_ASM.ISNT ONLINE ONLINE lsoda01 STABLE ONLINE ONLINE lsoda01 STABLE ORALSTARESONDER STABLE ORALSTAR | ONL | INE | ONLINE | lsoda02 | STABLE | |
| ONLINEONLINEIsoda01STABLEONLINEONLINEIsoda02STABLEOTA.DATA.dg | ora.ASMNET2LSNR_AS | M.ls | nr | | | |
| ONLINEONLINElsoda02STABLEora.DATA.dgONLINEONLINElsoda01STABLEONLINEONLINElsoda02STABLEora.LISTENER.IsnSTABLEONLINEONLINElsoda02STABLEora.RECO.ACFSVOL.advmsm/acfsvol-86 is online, STABLEONLINEONLINElsoda02Volume device /dev/aONLINEONLINElsoda02Volume device /dev/aONLINEONLINElsoda02Volume device /dev/aora.RECO.DATAFSVOL.advmsm/acfsvol-86 is online, STABLEONLINEONLINElsoda01Volume device /dev/aora.RECO.DATAFSVOL.advmONLINEONLINElsoda01Volume device /dev/aora.RECO.DATAFSVOL.advmONLINEONLINElsoda02volume device /dev/aora.RECO.DATAFSVOL.advmONLINEONLINElsoda02volume device /dev/aora.RECO.DATAFSVOL.advmONLINEONLINElsoda02volume device /dev/aora.RECO.DATAFSVOL.advmONLINEONLINElsoda02volume device /dev/aora.RECO.DATAFSVOL.advmONLINEONLINElsoda02volume device /dev/aONLINEONLINElsoda02stableora.RECO.dgstablevolume device /dev/aONLINEONLINElsoda02stableora.REDO.dgstable <t< td=""><td>ONL</td><td>INE</td><td>ONLINE</td><td>lsoda01</td><td>STABLE</td></t<> | ONL | INE | ONLINE | lsoda01 | STABLE | |
| ora.DATA.dg ONLINE ONLINE NISCONSTRUCTED STABLE ONLINE ONLINE NISC | ONL | INE | ONLINE | lsoda02 | STABLE | |
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| ora.REDO.dg NLINE ONLINE lsoda01 STABLE ONLINE ONLINE lsoda02 STABLE ora.net1.network NLINE ONLINE lsoda01 STABLE ONLINE ONLINE lsoda02 STABLE ora.net2.network NLINE ONLINE lsoda01 STABLE ONLINE ONLINE lsoda01 STABLE | ONL | INE | ONLINE | lsoda02 | STABLE | |
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| | ONLINE | ONLINE | lsoda01 | STABLE | |
|-----------------|----------|--------|---------|----------------------|--|
| | ONLINE | ONLINE | lsoda02 | STABLE | |
| ora.proxy_advm | | | | | |
| | ONLINE | ONLINE | lsoda01 | STABLE | |
| | ONLINE | ONLINE | lsoda02 | STABLE | |
| ora.reco.acfsv | ol.acfs | | | | |
| | ONLINE | ONLINE | lsoda01 | mounted on /sapmnt,S | |
| | | | | TABLE | |
| | ONLINE | ONLINE | lsoda02 | mounted on /sapmnt,S | |
| | | | | TABLE | |
| ora.reco.dataf | svol.acf | S | | | |
| | ONLINE | ONLINE | lsoda01 | mounted on /odadataf | |
| | | | | s,STABLE | |
| | ONLINE | ONLINE | lsoda02 | mounted on /odadataf | |
| | | | | s,STABLE | |
| | | | | | |
| Cluster Resour | ces | | | | |
| | | | | | |
| ora.LISTENER_S | CAN1.lsn | r | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | |
| ora.LISTENER_S | CAN2.lsn | r | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | |
| ora.MGMTLSNR | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | 169.254.106.65 192.1 | |
| | | | | 68.16.25 192.168.17. | |
| | | | | 25,STABLE | |
| ora.ado.ado_dv | ebmgs00. | SVC | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | |
| ora.ado.db | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | Open,STABLE | |
| 2 | ONLINE | ONLINE | lsoda02 | Open,STABLE | |
| ora.asm | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | Started, STABLE | |
| 2 | ONLINE | ONLINE | lsoda02 | Started, STABLE | |
| ora.cvu | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | |
| ora.lsoda01.vip | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | |
| ora.lsoda02.vip | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | |
| ora.mgmtdb | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | Open,STABLE | |
| ora.oc4j | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | |
| ora.scan1.vip | | | | | |

| 1 | ONLINE | ONLINE | lsoda01 | STABLE | | |
|------------------------|----------|--------|---------|--------|--|--|
| ora.scan2.vip | | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | | |
| sap.ADO.ASCS00 | .abapenq | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | | |
| sap.ADO.ASCS00 | .startsr | v | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | | |
| sap.ADO.ERS10.abaprep | | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | | |
| sap.ADO.ERS10.startsrv | | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | | |
| sap.ADO.abapvip | | | | | | |
| 1 | ONLINE | ONLINE | lsoda02 | STABLE | | |
| sap.ADO.aersvip | | | | | | |
| 1 | ONLINE | ONLINE | lsoda01 | STABLE | | |
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