

ORACLE® HYPERION ENTERPRISE
PERFORMANCE MANAGEMENT SYSTEM
HYPERION® SHARED SERVICES

RELEASE 11.1.1.X

ACTIVE-PASSIVE FAILOVER
CLUSTERS (WINDOWS
ENVIRONMENTS)



CONTENTS IN BRIEF

| | |
|---|----|
| About Shared Services High Availability | 2 |
| Deploying Shared Services in a Failover Cluster | 2 |
| Configuring Shared Services in an Oracle Clusterware Failover Cluster | 3 |
| Oracle Internet Directory Clustering | 15 |
| Additional Information | 16 |

About Shared Services High Availability

To make Oracle's Hyperion® Shared Services highly available, you must use clustering solutions to ensure that none of these components is a single point of failure:

- Web application
- Native Directory
- Database

See the documentation for your relational database management system (RDBMS).

These configurations are supported:

- Web application and OpenLDAP Native Directory in a failover cluster using Oracle Clusterware

See “[Configuring Shared Services in an Oracle Clusterware Failover Cluster](#)” on page 3.

- Web application with Oracle Clusterware and Oracle Internet Directory in any active-passive failover cluster supported by Oracle Internet Directory

See “[Oracle Internet Directory Clustering](#)” on page 15.

You cluster Shared Services and Native Directory for failover using Oracle Clusterware 11.1, which is available for free to protect Oracle Hyperion Enterprise Performance Management System components. See “[Installing and Configure Oracle Clusterware](#)” on page 7. You can download Oracle Clusterware software from http://www.oracle.com/technology/software/products/database/oracle11g/111060_win32soft.html, and information about Oracle Clusterware is available at this Oracle Technology Network address: <http://www.oracle.com/technology/products/database/clusterware/index.html>. Licensing information is available at http://download.oracle.com/docs/cd/B28359_01/license.111/b28287/editions.htm.

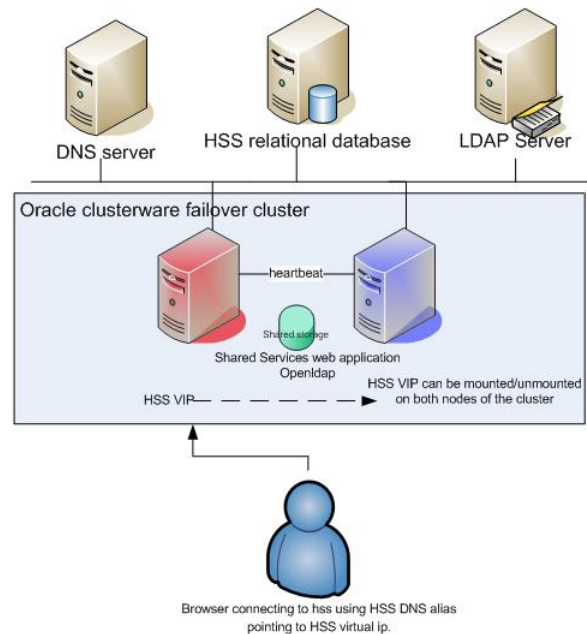
Database clustering solutions depend on the RDBMS that you use. EPM System products support Oracle Real Application Clusters and third-party (RDBMS) software.

Deploying Shared Services in a Failover Cluster

Before clustering Shared Services Web application for failover, you must meet Oracle Clusterware prerequisites and then install and configure Oracle Clusterware. See “[Meeting Oracle Clusterware Prerequisites](#)” on page 3 and “[Installing and Configure Oracle Clusterware](#)” on page 7.

In a failover cluster, the Shared Services Web application and Native Directory are accessible at a specific IP address referenced by a DNS name alias. If the primary node fails, the virtual IP and Shared Services Web application services and Native Directory move automatically to the secondary node, as shown in [Figure 1](#).

Figure 1 Shared Services Oracle Clusterware Failover Cluster

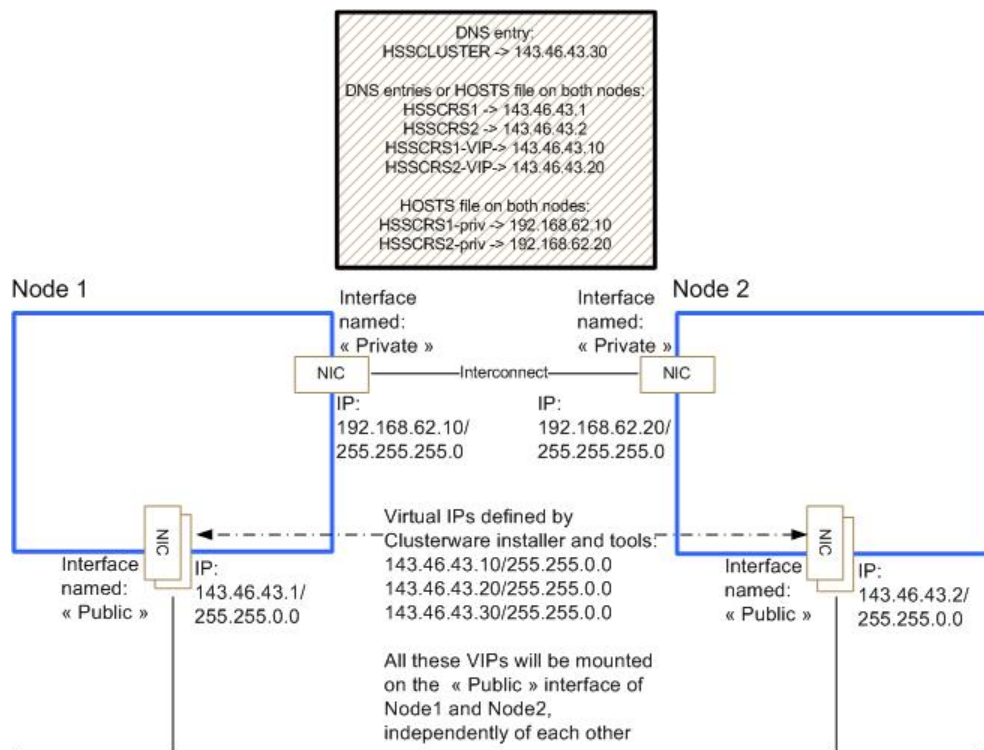


Configuring Shared Services in an Oracle Clusterware Failover Cluster

Meeting Oracle Clusterware Prerequisites

- To meet Oracle Clusterware prerequisites:
 - 1 Review Chapter 2, "Server and Network Preinstallation Tasks," in the *Oracle Clusterware Installation Guide* (http://download.oracle.com/docs/cd/B28359_01/install.111/b28250.pdf).
 - 2 Ensure that the clocks of both machines in the cluster are synchronized.
 - 3 Define IPs and virtual IPs, making sure to meet Oracle Clusterware requirements.

For example:



- Node 1
 - Interface
 - HSSCRS1
 - Type: Public
 - IP Address: 143.46.43.1
 - Subnet: 255.255.0.0
 - Location: DNS
 - HSSCRS1-vip
 - Type: Virtual
 - IP Address: 143.46.43.10
 - Subnet: 255.255.0.0
 - Location: DNS
 - HSSCRS1-priv
 - Type: Private
 - IP Address: 192.168.62.10
 - Subnet: 255.255.255.0
 - Location: Host files on both nodes
- Node 2
 - Interface
 - HSSCRS2

- Type: Public
- IP Address: 143.46.43.2
- Subnet: 255.255.0.0
- Location: DNS
- HSSCRS2–vip
 - Type: Virtual
 - IP Address: 143.46.43.20
 - Subnet: 255.255.0.0
 - Location: DNS
- HSSCRS2–priv
 - Type: Private
 - IP Address: 192.168.62.20
 - Subnet: 255.255.255.0
 - Location: Host files on both nodes

Note: You need not create HSSCRS1-vip and HSSCRS2-vip physically. When configuring your network interfaces, set TCP/IP parameters only for the public and the private interface, without configuring virtual IPs.

4 Plan a virtual IP-subnet (for example, 143.46.43.30/255.255.0.0) for Shared Services Web application, with a corresponding DNS entry (for example, hsscluster).

5 Ensure that a shared disk is connected to both nodes.

The shared disk is not formatted and will be configured for RAW device access and Oracle Cluster File System access by the Oracle Clusterware installer.

6 Ensure that each server has at least two network interfaces (more if the cards are teamed):

- Interfaces must be renamed Public and Private identically on both nodes:
 - Public provides connectivity from client to server.
 - Private provides server interconnection.
 - Public and Private interfaces have different subnet masks.
- In the network adapter binding order, the Public interface must be listed first. To open the screen where you set this order, Select Network Connections from the Windows Control Panel, THEN select the Advanced menu and the Advanced Settings command.

7 Disable write caching on all disks that will be used to share data between nodes in the cluster:

- a. Click **Start**, then select **Settings**, then **Control Panel**, then **Administrative Tools**, then **Computer Management**, and then **Device Manager**.
- b. In the device list, expand **Disk drives**, and double-click the first drive that is listed.
- c. On the **Policies** tab, deselect the option that enables the write cache.

You can also modify Windows registry keys to enable or disable the write cache.

To disable the write cache:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Enum\SCSI\“Device-Name”\“Resurce”\Device Parameters\Disk]
“CacheIsPowerProtected”=dword:00000000
“UserWriteCacheSetting”=dword:00000000
```

To enable the write cache:

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Enum\SCSI\“Device-Name”\“Resurce”\Device Parameters\Disk]
“CacheIsPowerProtected”=dword:00000001
“UserWriteCacheSetting”=dword:00000001
```

The Microsoft tool `Dskcache.exe` can also be used to enable or disable the write cache.

8 Restart the servers.

9 Disable media sensing:

Caution! Because you must modify the Windows registry to disable Media Sensing, first back up the registry and confirm that you can restore it, as described in Windows documentation.

- a. To disable Windows Media Sensing for TCP/IP, set the value of the `DisableDHCPMediaSense` parameter to 1 on each node.
- b. On each node of your cluster:
 - i. Back up the Windows registry.
 - ii. Use `Regedt32.exe` to view this key in the registry: `HKEY_LOCAL_MACHINE/System/CurrentControlSet/Services/Tcpip/Parameters`.
 - iii. Add these registry values:
 - Value Name—`DisableDHCPMediaSense`
 - Data Type—`REG_DWORD`
 - Value—1
 - iv. Restart the computer.

10 On both nodes, stop the Distributed Transaction Coordinator service, and set it as manual.

11 Partition the shared drive-hard drive:

- a. On all nodes of the cluster, enable automount:
 - i. On a Windows command line, enter `diskpart`.
 - ii. On the command line, enter `AUTOMOUNT ENABLE`.
 - iii. Restart the computer.
- b. On one cluster node only:
 - i. In the Windows Control Panel, double-click **Administrative Tools**
 - ii. Double-click **Computer Management**.

- iii. Double-click **Storage**.
- iv. Double-click **Disk Management**.
- v. Initialize the disk.
- vi. Right-click the disk, select **New Partition**, and then select **Create an extended partition** and use all available disk space.
- vii. Right-click the disk, and create logical drives:
 - Three partitions of 512 MB each for Voting disks
 - Two partitions of 512 MB for OCR and Mirror OCR disks
 - One partition for software

Note: Do not assign drive letters while creating the partition, and do not format the partitions. Restart the second node after configuring the shared disk on the first node only. After restarting the second node, return to Computer Management and delete the drive letters. All the letters for volumes on the shared disk must be deleted on both nodes.

12 From Oracle Clusterware, check prerequisites with this command:

```
runcluvfy stage -post hwos -n NODE1,NODE2 -verbose
```

The `runcluvfy.bat` file is in the Clusterware installation folder.

Note: In some cases, node connectivity fails, but you can ignore this warning if you can ping the private and public names of the servers.

Installing and Configure Oracle Clusterware

► To install and configure Oracle Clusterware:

- 1 On one node only, launch `setup.exe` from the Oracle Clusterware installation directory to install Oracle Clusterware on the `C:` drive.

Note: You can keep the cluster name default.

- 2 On the **Specify cluster configuration** screen, enter the public, private, and virtual host names for both nodes.

Note: You must click Add to enter information about node 2.

- 3 In **Specify Network Interface usage**, specify the private and public interface.

Note: No change is required unless you want to distinguish between Public or Private one for additional network interfaces.

- 4 On the **Cluster Configuration Storage** screen, specify these locations:

- OCR (cluster registry)—Two devices, OCR primary and mirror

- Voting disk—Three devices
Specify “place voting disk on this partition 3 times.”
- Partition for software, which is formatted with OCFS:
 - Use partition for software storage
 - Format with CFS check.
 - Assign drive letter Y.

Note: You can ignore any warning messages.

Tip: If you do not select the partition for software, you can format the software partition later with the `ocfsformat` tool in the `CRS_HOME/cfs/` directory. See “Formatting Drives to Use Oracle Cluster File System after Installation” in the *Oracle Clusterware Installation Guide* (http://download.oracle.com/docs/cd/B28359_01/install.111/b28250/crswin.htm).

5 If Oracle Clusterware fails on virtual IP creation, use `product\11.1.0\crs\bin\VIPCA.bat` to create the virtual IPs manually.

6 Click **Finish**.

7 From a Windows Command Line prompt, run this command:

```
c:\product\11.1.0\crs\BIN\cluvfy stage -post crsinst -n node1,node2
```

Note: Post-configuration validation of virtual IPs may fail with Oracle's Hyperion Enterprise Performance Management System Configurator or the `cluvfy` command. This is not a problem if you can see the virtual IP on the nodes using the `ipconfig /all` command.

Creating an Application Virtual IP

Create an application Virtual IP for Shared Services that is mounted and unmounted on the Public interface by Oracle Clusterware.

Tip: You can run `HYPERION_HOME\common\utilities\crs\createvip.bat` to create a virtual IP, but first you must open the file and set the `VIPIP` value as 143.46.43.30 and `VIPSUBNET` value as 255.255.0.0. Also ensure that the `CRS_HOME` value is set to `c:\product\11.1.0\bin` and that the `ADAPTER` value reflects the name of your public network interface.

Shared Services Installation

Use Oracle Hyperion Enterprise Performance Management System Installer, Fusion Edition to install Shared Services on both nodes of the cluster, following the instructions in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* and these guidelines:

- Before beginning installation on either node, shut down the other node.
- For each node, install Shared Services on the shared disk `Y:\Hyperion`.
- Because of an OCFS limitation on Windows, after installing Shared Services on node 1 and shutting down the node, you must wait 5 minutes for `Y:\` to become accessible on node 2.
- Click Finish (not Configure) on the last Oracle Hyperion Enterprise Performance Management System Installer, Fusion Editions screen.
- After each installation, set the Hyperion Foundation OpenLDAP service as manual.

Configuring Shared Services

Note: Before configuring Shared Services, ensure that the `hsscluster` alias points to the virtual IP for Shared Services, through DNS or host files entries on both cluster nodes. You configure Shared Services on the node where the Shared Services virtual IP is mounted. You can use the `crs_stat -t -v` command to check where the virtual IP is mounted. This document assumes that the virtual IP is mounted on node 2. If this prerequisite is not met, the Shared Services logical Web application name may not be recorded correctly in the Oracle's Hyperion Shared Services Registry, which could lead to Oracle Hyperion Enterprise Performance Management System product registration issues.

Add on all nodes of the cluster, on the first line of the `hosts` file:

```
143.46.43.30 hsscluster
```

where `143.46.43.30` is the Shared Services cluster virtual IP for the Shared Services resource and `hsscluster` is the alias.

Use EPM System Configurator to configure Shared Services on both nodes of the cluster, starting with node 2. See the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*.

► To configure Shared Services:

1 On node 2:

- From the Windows Start menu, select **Programs**, then **Oracle EPM System**, then **Foundation Services**, then **EPM System Configurator**.
- Select the Foundation tasks for **Configure database**, **Common Settings**, and **Deploy to Application Server**.
- For the database configuration, select **Perform 1st time configuration of Shared Services database**.
- Ensure that **Create Windows Services** is selected.
- On the application server deployment screen, click **Advanced Setup** and enter `hsscluster:28080`, where `hsscluster` is a DNS entry pointing to the Shared Services virtual IP, and ensure that you can ping `hsscluster`.

This step defines the logical name for Shared Services Web application.

- f. When Oracle's Hyperion Enterprise Performance Management System Configurator closes, use Lifecycle Management from Shared Services to edit the `CSSConfig` file in the Shared Services registry:

See the *Oracle Hyperion Enterprise Performance Management System Lifecycle Management Guide*.

- i. Log on to Shared Services.
- ii. Click **Application groups**, then **Deployment Metadata**, and then **Shared Services**.
- iii. Expand **Shared Services registry**, then **Foundation services product – 9.5.0.0**, and then **Shared Services — 9.5.0.0**.
- iv. Right click `CSSConfig`, select **Export for edit**, and save the file on a local drive.
- v. Change the host for `hub location` as follows:

```
hub location=http://hsscluster:28080
```

where *hsscluster* is a DNS entry pointing to the Shared Services virtual IP.
- vi. Right-click `CSSConfig`, and select **Import**.
- vii. Check the `NATIVE_PROVIDER.properties` file, and ensure that the `host` entry points to *hsscluster*.
- g. Stop the Hyperion Foundation Shared Services – Web application and Hyperion Foundation OpenLDAP services, and set them as manual.

2 On node 1:

- a. Create a Hyperion Foundation Shared Services – Web application service using `HYPERION_HOME\deployments\AppServer\bin\installServiceSharedServices9.bat`.
- b. Stop the Hyperion Foundation Shared Services – Web application and Hyperion Foundation OpenLDAP services, and set them as manual.

Note: If the Shared Services Web application service does not start on the node where `installServiceSharedServices9.bat` was run, manually validate that the Windows registry entry defining the Web application under `HKLM\Software\Hyperion Solutions` is not missing. You can compare the two nodes.

Registering Shared Services in the Cluster

- To register Shared Services in the cluster:

1 Create an action program for Shared Services.

Oracle Clusterware uses this script to start, stop and check the status of Shared Services.

The `hss11.bat` file is provided as a sample action script that you can modify and use to monitor Shared Services and OpenLDAP.

- a. Create a folder on the shared drive called `y:\crs_action\hss`.
- b. Copy `HYPERION_HOME\common\utilities\crs\hss11.bat`, the `HYPERION_HOME\common\utilities\crs\com` folder, and all JAR files in `HYPERION_HOME\common\utilities\crs` to the `y:\crs_action\hss` folder.
- c. Open `y:\crs_action\hss\hss11.bat` in a text editor and make these changes:

- Replace these lines:

```
:Start
Echo %DATE% %TIME% -- Starting OpenLdap Service : %OpenLdapSvc% >>
%LOGSCR%
REM DEBUG Echo sc start %OpenLdapSvc% >> %LOGSCR%
sc start %OpenLdapSvc%
```

with these lines:

```
:Start
Echo %DATE% %TIME% -- Starting OpenLdap Service : %OpenLdapSvc% >>
%LOGSCR%
REM DEBUG Echo sc start %OpenLdapSvc% >> %LOGSCR%

REM OCFS lock. Important to delay startup for 5 mins
java com.hyperion.utils.Sleep 300
sc start %OpenLdapSvc%
```

- If necessary, change the `SCRIPT_PATH` and `HSSURL` values as follows:

- `set SCRIPT_PATH=Y:\CRS_ACTION\HSS`
- `set HSSURL=http://hsscluster:28080/interop/index.jsp`

2 Create and register an application profile for Shared Services.

The `registerhss.bat` file in `HYPERION_HOME\common\utilities\crs` automatically creates an application profile and registers the application profile with Oracle Clusterware.

Before running this batch file, you must open it in a text editor to check and change some settings:

- Ensure that `ACTION_SCRIPT` and `CRS_HOME` settings are as follows:
 - `set ACTION_SCRIPT=y:\CRS_ACTION\HSS\hss11.bat`
 - `set CRS_HOME=c:\product\11.1.0\crs\bin`
- Change timeout settings as follows:
 - `set FAILOVER_DELAY=0`
 - `set START_TIMEOUT=600`
 - `set SCRIPT_TIMEOUT=600`

Managing the Shared Services Cluster

You use Oracle Clusterware to manage the Shared Services cluster. You can control Oracle Clusterware manually with the Command Line tool `crsctl`. You use `crsctl` commands to start and stop Oracle Clusterware. Using `crsctl` options, you can perform tasks such as enabling

online debugging and dynamically adding, removing, and backing up voting disks. These commands must be run from a shell in the `C:\product\11.1.0\crs\BIN` folder.

Checking the Cluster

Use the command `crs_stat -t -v` to check the cluster status. Running `crs_stat -t -v` provides the status of the cluster resource, including Shared Services and virtual IPs.

Perform login checks from a Web browser, using <http://hsscluster:28080/interop/index.jsp>, to ensure that Shared Services runs correctly.

Monitoring the Cluster

The logical application name registered in the cluster with `registerhss.bat` is `hss-webapp`, and resources monitored include Native Directory and Web application. The following commands are available to for monitoring your Shared Services cluster, where *Application_Name* is `hss-webapp`:

- `crsctl start crs`—Starts the following services on current node: OracleCSService, OracleEVMSERVICE, and OracleCRSService.
- `crsctl stop crs`—Stops OracleCSService, OracleEVMSERVICE, and OracleCRSService on the current node.

If the other node is running, all applications that are managed by the Oracle Clusterware are relocated from the current node to the other node. If the command is launched on all nodes, all the applications and services are stopped.

- `crsctl check crs`—Verifies that the services OracleCRService, OracleCSService and OracleEVMSERVICE are running on the node from which you are checking.
- `crs_start Application_Name`—Starts the service related to the specified application. This causes Oracle Clusterware to call the action programs with the start parameter.

Caution! The start of the application service must be done only with this command.

You can start the Oracle Clusterware registered application using the option `-f` (force) when there is relationship between applications (for example, Shared Services and Shared Services virtual IP).

- `crs_stat Application_Name`—Calls the action programs (such as `hss11.bat`) with the check parameter. Using the option `-t` or `-v`, you can query the state of all Oracle Clusterware registered applications to view additional information about the status of the applications.
- `crs_stop Application_Name`—Stops the application and the service related to the given application. This causes Oracle Clusterware to call the action programs with the stop parameter.

Caution! Use only this command to stop the application service. When you use this command for a specific application, its target status is changed to Offline, and the application stays offline after an Oracle Clusterware startup.

You can stop the Oracle Clusterware registered application using the option `-f` (force) when there is relationship between applications (for example, Shared Services and Shared Services virtual IP).

Note: In a normal stop, the target status of the application is Offline, and Clusterware does not restart the application in case of a failure.

When you stopping the application using this command, the action program is called with the stop parameter, and the related application services are shut down on the server where you are working.

- `crs_relocate -f Application_Name`—Stops the specified application and starts it on an other node in the cluster.

The `crs_start`, `crs_stop`, and `crs_stat` commands become unavailable when the Cluster Ready Service (OracleCRService) is stopped.

Oracle Clusterware Backup and Recovery

These Oracle Clusterware components should be backed up so you can recover them in case of failure:

- Voting disk—Manages information about node membership
- Cluster Registry—Manages cluster and Oracle Real Application Clusters database configuration information)

Voting Disk Backup and Recovery

Oracle recommends the backup of the Voting Disk after the installation. This backup is to be done only after the initial cluster is created.

➤ To back up the voting disk:

- 1 Stop Oracle Clusterware on all nodes with the command `crsctl stop crs`.
- 2 Determine the number of voting disks with the command `crsctl query css votedisk` (on all the nodes).
- 3 Create a backup script for each voting disk, using the command `11.1.0\crs\bin\ocopy \\. \votedsk1 c:\backuplocation`, and copy the backup files to a secure location.
- 4 Restart Oracle Clusterware on all nodes with the command `crsctl start crs`.

➤ To recover backed up voting disks:

- 1 Stop Oracle Clusterware on all nodes with the command `crsctl stop crs`.

- 2 **Enter this command:** `c:\product\11.1.0\crs\BIN\ocopy_backup_location
\backup_votedsk1_datexyz \\.votedsk1`
- 3 **Restart Oracle Clusterware on all nodes with the command** `crsctl start crs.`

Oracle Clusterware Registry Backup and Recovery

You can back up the Oracle Clusterware registry automatically or manually. For information about automatic backups, see the Oracle Clusterware documentation. You can back up the registry manually at any time. For example, you can obtain a binary backup before making changes to the Oracle Clusterware registry.

- To back up the Oracle Clusterware registry:

- 1 **Create the destination directory for the backup file on one node.**
- 2 **Check Oracle Clusterware registry information using the command** `ocrcheck.`
- 3 **Enter the command** `ocrconfig -manualbackup.`
- 4 **Copy the backup file to the other node.**

If an application fails, restart the application before attempting to restore the Oracle Clusterware registry.

- To determine whether the Oracle Clusterware registry has failed, use the `ocrcheck` command.

If the `ocrcheck` command returns a failure message, then both the primary Oracle Clusterware registry and the Oracle Clusterware registry mirror have failed. Attempt to correct the problem using one of the following platform-specific restoration procedures.

- To recover the Oracle Clusterware registry:

- 1 **Enter the command** `ocrconfig -showbackup`, and note the name of the latest backup file.
- 2 **On all remaining nodes, using the Service Control Panel, disable and stop these Oracle Clusterware services:**
 - OracleClusterVolumeService
 - OracleCSService
 - OracleCRService
 - OracleEVMService

- 3 **Run the command** `ocrconfig -restore path`, where *path* is the location and name of the latest backup file.

For example, run the command `ocrconfig -restore C:\product\11.1.0\crs\cdata
\cluster\backup00.ocr.`

- 4 **Restart the Oracle Clusterware services and nodes:**

- a. Start all of the services that you stopped in [step 2](#).
- b. Restart all of the nodes, and resume operations in cluster mode.

- 5 **Run this command to verify the Oracle Clusterware registry integrity:** `cluvfy comp ocr [-n
node_list] | all [-verbose].`

The `-n node_list | all` argument retrieves a list of all nodes that are configured as part of the cluster.

Log Files

The global log for all Oracle Clusterware daemons is `C:\product\11.1.0\crs\log\server1>alertserver1.log`.

Oracle Clusterware also creates these detail log files:

- All client activities on Oracle Clusterware—`C:\product\11.1.0\crs\log\server1\client`
- Oracle Clusterware crsd daemon—`C:\product\11.1.0\crs\log\server1\crsd`
- Oracle Clusterware cssd daemon—`C:\product\11.1.0\crs\log\server1\cssd`
- Oracle Clusterware evmd daemon—`C:\product\11.1.0\crs\log\server1\evmd`

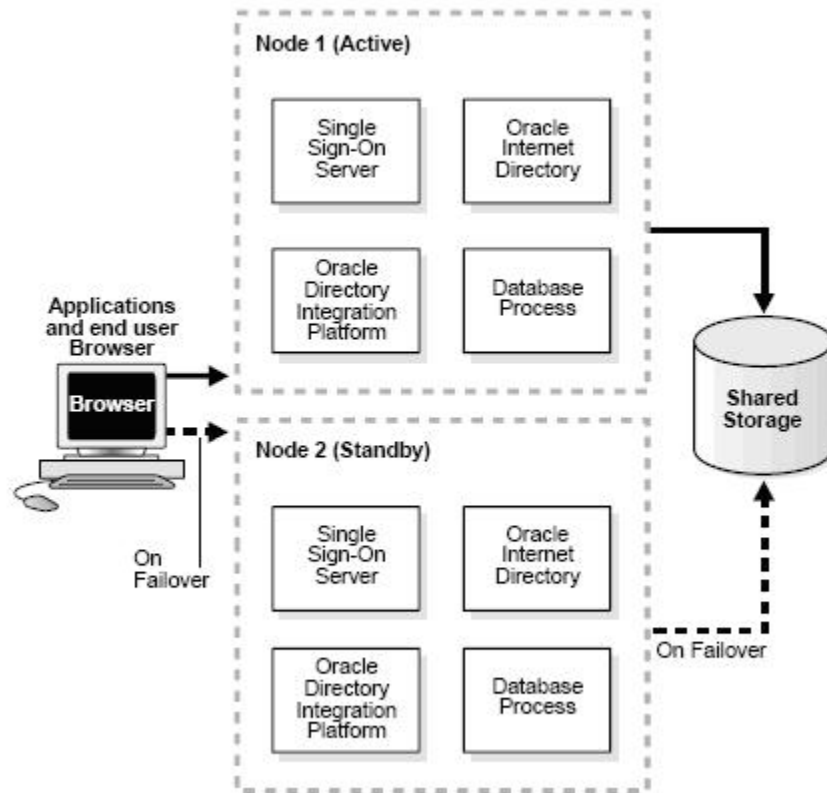
Oracle Internet Directory Clustering

You can cluster Oracle's Hyperion® Shared Services Oracle Internet Directory Native Directory for high availability. Oracle Internet Directory is supported as native provider in any active-passive mode supported by Oracle Internet Directory.

You can use several techniques for making Oracle Internet Directory highly available. References:

- <http://www.oracle.com/technology/products/oid/pdf/oid-largescaledirectory-ha-performance.pdf>
- http://www.oracle.com/technology/products/oid/pdf/oid_tuning_configuration_quickreference_01.pdf

Figure 2 Oracle Internet Directory Deployment Using Cold Failover



Additional Information

You can download more information about high availability Oracle Clusterware from http://download.oracle.com/docs/cd/B28359_01/rac.111/b28255.pdf.

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Shared Services Active-Passive Failover Clusters (Windows Environments), 11.1.1.x

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