Oracle® Solaris Cluster Data Service for Oracle E-Business Suite as of Release 12.2 Guide

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Using This Documentation

- **Overview** – Describes how to install and configure the Oracle Solaris Cluster HA for Oracle E-Business Suite 12.2 or Later data service.
- **Audience** – Technicians, system administrators, and authorized service providers.
- **Required knowledge** – Advanced experience troubleshooting and replacing hardware.

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Installing and Configuring Oracle Solaris Cluster HA for Oracle E-Business Suite 12.2 or Later

This chapter explains how to install and configure Oracle Solaris Cluster HA for Oracle E-Business Suite 12.2 or Later for Oracle E-Business Suite 12.2 or later versions of the release.

For information about supported Oracle E-business Suite versions up to release 12.1, see Oracle Solaris Cluster Data Service for Oracle E-Business Suite up to Release 12.1 Guide.

This chapter contains the following sections.

HA for Oracle E-Business Suite 12.2 or Later Overview

The HA for Oracle E-Business Suite 12.2 or later data service provides a mechanism for orderly startup and shutdown, fault monitoring, and automatic failover of the Oracle E-Business Suite 12.2 or later.

Oracle Solaris Cluster delivers a new resource type `ORCL.ebs`, that provides high availability for Oracle E-Business Suite 12.2.4 or later with technology stack (TXK) and Applications Database (AD) C.Delta.6 or later.

The following table lists the support provided by the resource type `ORCL.ebs` for the Oracle E-Business Suite 12.2 or later services. Each Service Group and Service has a short name that is represented within a square bracket, that will be used when registering Oracle E-Business Suite 12.2 or later services with the `ORCL.ebs` resource type.

TABLE 1 Services Supported by `ORCL.ebs` in Oracle E-Business Suite 12.2 or Later

Service Group	Service
Root Service [root]	Node Manager [node_manager]
Web Administration [web_admin]	WebLogic Admin Server [admin_server]
	TNS Listener [tns_apps]
Web Entry Point [web_entry]	Oracle HTTP Server [ohs]
	Oracle Process Manager [opmn]
Web Application Services [web_applications]	oacore [oacore]
	oafm [oafm]
	forms [forms]
	forms-c4ws [forms-c4ws]
	TNS Listener [tns_apps]
Batch Processing Services [batch]	Concurrent Manager [concmgr]
	TNS Listener [tns_apps]
Other Services [other]	Forms Server [forms_server]

Oracle E-Business Suite enables you to configure multiple instances of managed servers running the oacore, forms, oafm and forms-c4ws web applications on each Oracle Solaris Cluster node.

Note - Each Service Group and Service has a short name, as shown in square brackets in Table 1, “Services Supported by `ORCL.ebs` in Oracle E-Business Suite 12.2 or Later,” on page 10, that will be used when registering Oracle E-Business Suite 12.2 services with ORCL.ebs.

Overview of Installing and Configuring HA for Oracle E-Business Suite 12.2 or Later

The following table summarizes the tasks for installing and configuring HA for Oracle E-Business Suite 12.2 or later and provides cross-references to detailed instructions for performing these tasks. Perform the tasks in the order that they are listed in the table.

TABLE 2 Tasks for Installing and Configuring HA for Oracle E-Business Suite 12.2 or Later

Task	Instructions
Plan the installation	"Planning the HA for Oracle E-Business Suite 12.2 or Later Installation and Configuration" on page 11
Install and configure the Oracle E-Business Suite 12.2 or later software	"Installing and Configuring Oracle E-Business Suite 12.2 or Later" on page 12
Install HA for Oracle E-Business Suite 12.2 or later packages	"How to Install the HA for Oracle E-Business Suite 12.2 or Later Package" on page 17
Register and configure the `ORCL.ebs` resource type	"Registering and Configuring the `ORCL.ebs` Resource Type" on page 18
Verify the HA for Oracle E-Business Suite 12.2 or later installation and configuration	"How to Verify the HA for Oracle E-Business Suite 12.2 or Later Installation and Configuration" on page 38
Upgrade the HA for Oracle E-Business Suite 12.2 or later data service	"How to Upgrade to the New Version of HA for Oracle E-Business Suite 12.2 or Later" on page 39

Planning the HA for Oracle E-Business Suite 12.2 or Later Installation and Configuration

This section contains the information you need to refer to while planning your HA for Oracle E-Business Suite 12.2 or later installation and configuration.

Note - Refer to the "Configuration Requirements" on page 13 section for configuration requirements and restrictions before installing or upgrading to Oracle E-Business Suite 12.2 or later.

References to Oracle E-Business Suite 12.2 or Later

To install or upgrade to Oracle E-Business Suite 12.2 or later, use the following Oracle E-Business Suite documentation and the relevant My Oracle Support (MOS) notes:

- Oracle® E-Business Suite Installation Guide: Using Rapid Install Release 12.2 (12.2.0)
- R12.2: How To Create the Stage In Preparation For Installation (Doc ID 1596433.1)
- Solaris SPARC 64-bit checksum file, MD5 Checksums for R12.2 Rapid Install Media (Doc ID 1505510.1)
- Oracle E-Business Suite Release Notes, Release 12.2 (Doc ID 1320300.1)
- Oracle E-Business Suite Installation and Upgrade Notes Release 12 (12.2) for Oracle Solaris on SPARC (64-bit) (Doc ID 1330702.1)
- Using Oracle 11g Release 2 Real Application Clusters and Automatic storage management with Oracle E-Business Suite Release 12.2 (Doc ID 1453213.1)
- Troubleshooting Rapid Install for E-Business Suite Release 12.2 (Doc ID 1378579.1)
- Applying the Latest AD and TXK Release Update Packs to Oracle E-Business Suite Release 12.2 (Doc ID 1617461.1)
- Oracle E-Business Suite Release 12.2.4 Readme (Doc ID 1617458.1)
- Sharing The Application Tier File System in Oracle E-Business Suite Release 12.2 (Doc ID 1375769.1) - Adding a Node to the Shared Application Tier File System.
- Cloning Oracle E-Business Suite Release 12.2 with Rapid Clone (Doc ID 1383621.1)
- Using Load-Balancers with Oracle E-Business Suite Release 12.2 (Doc ID 1375686.1)

Installing and Configuring Oracle E-Business Suite 12.2 or Later

This section contains information you need to install and configure Oracle E-Business Suite 12.2 or later. Before proceeding with the installation, refer to the Oracle E-Business Suite documentation and relevant MOS notes that are listed in the “References to Oracle E-Business Suite 12.2 or Later” on page 12 section.

Configuration Requirements

The configuration requirements in this section apply only to HA for Oracle E-Business Suite 12.2 or later.

Caution - If your data service configuration does not conform to these requirements, the data service configuration might not be supported.

Configuration Requirements While Installing or Upgrading Oracle E-Business Suite 12.2 or Later

Note the following configuration requirements, if you are installing or upgrading to a new Oracle E-Business Suite 12.2.4 or later system.

- The Primary Applications Node must be installed using an Oracle Solaris Cluster logical host.
- The Apps Base Dir must use a Shared Application Tier File System, such as a Cluster File System or NFS from a NAS storage system. An example is the Oracle ZFS Storage Appliance.
- The Shared Application Tier File System must be managed within Oracle Solaris Cluster by either the `SUNW.HAStoragePlus` (Cluster File System) or `SUNW.ScalMountPoint` (NFS) resource type. For more information, see the `SUNW.HAStoragePlus(7)` and `SUNW.ScalMountPoint(7)` man pages.
- Furthermore, Applications Nodes must be installed after the system has been upgraded to Oracle E-Business Suite 12.2.4 and AD/TXK C.Delta.6 or later.

Note - The Primary Applications Node will host the WebLogic Administration Server that is required when patching Oracle E-Business Suite 12.2. As such, installing the Primary Applications Node on an Oracle Solaris Cluster logical host provides high availability for the WebLogic Administration Server if a node failure occurs.

Additional Configuration Information

This section describes additional configuration requirements that you must follow while installing or upgrading Oracle E-Business Suite 12.2 or later.

Interpose Logical Host

Symbolic links - You must create the symbolic links as the Primary Applications Node is installed with a logical hostname.

As the root user on each Oracle Solaris Cluster node, create the following symbolic links:

```
# ln -s /usr/cluster/lib/libschost.so.1 /usr/lib/secure/libschost.so.1
# ln -s /usr/cluster/lib/64/libschost.so.1 /usr/lib/secure/64/libschost.so.1
```

Environment variables - If you need to source *Apps Base Dir*`/EBSapps.env run|patch` for the Primary Applications Node or any Applications Node, that uses an Oracle Solaris Cluster logical host, you must ensure that the following environment variables are set.

As the Oracle E-Business Suite Apps user, set the following environment variables:

```
$ export SC_LHOSTNAME=logical host
$ export LD_PRELOAD_32=/usr/lib/secure/libschost.so.1
$ export LD_PRELOAD_64=/usr/lib/secure/64/libschost.so.1
```

Note - You must ensure that the `custom`*global_db_name_logical host*`.env` is created on the run and patch file system. You must also add those environment variables to the following file for the Primary Applications Node or any Applications Tier Node, that uses an Oracle Solaris Cluster logical host.

In the following command, replace *logical host* with the Oracle Solaris Cluster logical hostname used for the Primary Applications Node. Replace *global_db_name* with the entry from the context file.

`${INST_TOP}/appl/admin/custom`*global_db_name_logical host*`.env`

WebLogic Administrator and APPS User Passwords

The Oracle Solaris Cluster resource type `ORCL.ebs` needs to retrieve passwords for the WebLogic Administrator and APPS user. These passwords must be saved by issuing the following command as the root user from an Oracle Solaris Cluster node. For the WebLogic Administrator password, provide the WebLogic Administrator password when prompted to enter a string value.

```
# /usr/cluster/bin/clpstring create -b db_name -t resource global_db_name_WLS
Enter string value:
Enter string value again:
#
```

For the APPS password, provide the APPS password when prompted to enter a string value. In the following command, replace *global_db_name* with the entry from the context file.

```
# /usr/cluster/bin/clpstring create -b db_name -t resource global_db_name_APPS
Enter string value:
Enter string value again:
#
```

Online Patching

Note - If an immutable zone cluster is being used for Oracle E-Business Suite services, before starting an online patch cycle, it is recommended to reboot the immutable zone cluster with the `-w` option.

See "How to Configure a Zone Cluster to Be Immutable" in *Installing and Configuring an Oracle Solaris Cluster 4.4 Environment* for information about an immutable zone cluster and "Using Immutable Zones" in *Planning and Administering Data Services for Oracle Solaris Cluster 4.4* for information about ensuring that write operations are allowed when installing or applying maintenance.

In summary, perform the following:

1. Stop the Oracle E-Business Suite services using Oracle Solaris Cluster commands.
2. Reboot the zone cluster using the `-w` option from the global zone.

For example;

```
# /usr/cluster/bin/clzc reboot -w <zone-cluster>
```

- Start the Oracle E-Business Suite services using Oracle Solaris Cluster commands.
- Start an online patch cycle, for example, `adop phase=prepare`.
- Follow the instructions below for steps to take before running the cutover phase.
- After the cutover phase has completed reboot the zone cluster without the `-w` option.

For example;

```
# /usr/cluster/bin/clzc reboot <zone-cluster>
```

After the zone cluster has rebooted, start the Oracle E-Business Suite services using Oracle Solaris Cluster commands.

Whenever an online patch is being applied, before running the cutover phase you must stop all Oracle E-Business Suite services using Oracle Solaris Cluster commands.

For example:

```
# /usr/cluster/bin/clresource disable resource
```

Furthermore, before running the cutover phase, ensure that all Oracle E-Business Suite services are stopped on the Primary Applications Node and any further Secondary Application Nodes. Once verified, you must manually start the Primary Applications Node Manager and WebLogic Admin Server on the node that is hosting the Primary Applications Node Oracle Solaris Cluster logical host.

For example:

```
root@node1:~# clrs status ebs-fo-lh-rs

=== Cluster Resources ===

Resource Name       Node Name      State        Status Message
-------------       ---------      -----        --------------
ebs-fo-lh-rs        node2          Offline      Offline - LogicalHostname offline.
                    node1          Online       Online - LogicalHostname online.

root@node1:~#
root@node1:~# su - <applmgr>
Oracle Corporation      SunOS 5.11      11.3    July 2017
You have new mail.
-bash-4.4$
-bash-4.4$ export LD_PRELOAD_32=/usr/lib/secure/libschost.so.1
-bash-4.4$ export LD_PRELOAD_64=/usr/lib/secure/64/libschost.so.1
-bash-4.4$ export SC_LHOSTNAME=<Primary Applications Node logical host>
-bash-4.4$
-bash-4.4$ . <Apps Base Dir>/EBSapps.env run
-bash-4.4$
-bash-4.4$ $ADMIN_SCRIPTS_HOME/adnodemgrctl.sh start
-bash-4.4$
-bash-4.4$ $ADMIN_SCRIPTS_HOME/adadminsrvctl.sh start
```

When executing the cutover phase, you must specify the `mtrestart=no` parameter.

For example:

```
$ adop phase=cutover mtrestart=no
```

Once the cutover phase has completed successfully, the Primary Applications Node Manager and WebLogic Admin Server will have been stopped by the cutover session. It will then be possible to start all Oracle E-Business Suite services again using Oracle Solaris Cluster commands.

For example:

```
# /usr/cluster/bin/clresource enable resource
```

Note - When Oracle E-Business Suite services are started again using `/usr/cluster/bin/clresource enable` <*resource*> the new environment is automatically sourced.

Installing the HA for Oracle E-Business Suite 12.2 or Later Package

The `oracle-ebs-fmw` package is included with the `ha-cluster-full` and the `ha-cluster-data-services-full` Oracle Solaris Cluster group packages.

If the two group packages were not used to install Oracle Solaris Cluster, then you can install the individual package.

If you did not install the HA for Oracle E-Business Suite 12.2 or Later package during your initial Oracle Solaris Cluster installation, perform this procedure to install the package.

▼ How to Install the HA for Oracle E-Business Suite 12.2 or Later Package

Perform this procedure on each cluster node where you want the HA for Oracle E-Business Suite 12.2 or Later software to run.

1. **On the cluster node where you are installing the data service package, assume the `root` role.**

2. **Install the HA for Oracle E-Business Suite 12.2 or Later software package.**

   ```
   # pkg install oracle-ebs-fmw
   ```

3. **Verify that the package installed successfully.**

   ```
   $ pkg info ha-cluster/data-service/oracle-ebs-fmw
   ```

   Installation is successful if output shows that `State` is `Installed`.

4. **Perform any necessary updates to the Oracle Solaris Cluster software.**
   For instructions about updating your software, see Chapter 10, “Updating Software Packages” in *Updating Your Oracle Solaris Cluster 4.4 Environment*.

Registering and Configuring the ORCL.ebs Resource Type

This section contains the procedures you need to register and configure the ORCL.ebs resource type.

Some procedures within this section require you to use certain Oracle Solaris Cluster commands. Refer to the relevant Oracle Solaris Cluster command man page for more information about these commands and their parameters.

Registering the ORCL.ebs Resource Type

After installing Oracle E-Business Suite 12.2 and upgrading to 12.2.4 or later together with AD/TXK C.Delta.6 or later, you can install and configure the ORCL.ebs resource type.

To register the ORCL.ebs resource type, as the root user on one Oracle Solaris Cluster node, enter the following command from the global cluster or zone cluster:

```
# /usr/cluster/bin/clrt register ORCL.ebs
```

Managing Oracle E-Business Suite Services with ORCL.ebs Resource Type

After the ORCL.ebs resource type has been registered, you can manage Oracle E-Business Suite 12.2.4 or later services with the ORCL.ebs resource type.

Creating a Resource Group for Oracle E-Business Suite 12.2 or Later

Services with Oracle E-Business Suite 12.2.4 or later can be managed by Oracle Solaris Cluster resources of type ORCL.ebs.

Those resources can be created within a failover resource group or a single-node or multi-master resource group.

Services from the Primary Applications Node or any Applications Tier Node that uses an Oracle Solaris Cluster logical host must be created within a failover resource group.

Services from an Application Tier Node that do not use an Oracle Solaris Cluster logical host must be created within a single-node or multi-master resource group.

- To create a failover resource group:

  ```
  # /usr/cluster/bin/clresourcegroup create [-n node[,...]] resource group
  ```

  For example:

  ```
  # clresourcegroup create ebs-fo1-rg
  ```

- To create a multi-master resource group:

  ```
  # /usr/cluster/bin/clresourcegroup create -S [-n node[,...]] resource group
  ```

  For example:

  ```
  # clresourcegroup create -S ebs-mm-rg
  ```

`[-n node[,...]]`

Specifies a node or a list of nodes in the target global cluster or zone cluster. For more information, see the `clresourcegroup`(8CL) man page.

Note - For a single-node resource group, specify just one node.

resource group

Specifies an Oracle Solaris Cluster resource group name for the Node Manager. This name must be unique for Oracle Solaris Cluster.

▼ How to Create the Root Service Group Resource

The Root Service Group contains services for Node Manager Service (root) This service can be configured within a failover resource group, single-node or multi-master resource group.

1. Create an appropriate resource group.

For more information, see "Creating a Resource Group for Oracle E-Business Suite 12.2 or Later" on page 18.

2. Create a Node Manager resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=root -p service=node_manager \
-p resource_dependencies_offline_restart=storage-resource \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d node-manager-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies an optional property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this property.

logical-host-resource

Specifies an optional property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used, omit this extension property.

node-manager-resource name

Specifies an Oracle Solaris Cluster resource name for the Node Manager. This name must be unique with Oracle Solaris Cluster.

3. Bring online the resource group and enable the resource.

```
# clresourcegroup online -eM resource group
```

resource group

Specifies the resource group that you created earlier.

▼ How to Create the Web Administration Service Group Resources

The Web Administration Service Group contains services for TNS Listener (tns_apps) and WebLogic Administration Server (admin_server). These services can be configured within a failover resource group, single-node or multi-master resource group.

1. Create an appropriate resource group.

For more information, see "Creating a Resource Group for Oracle E-Business Suite 12.2 or Later" on page 18.

2. Create the `tns_apps` resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_admin -p service=tns_apps \
-p resource_dependencies_offline_restart=storage-resource \
-p pmf_managed=true \
-p interpose_logical_hostname=logical host \
-d tns-listener-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies the logical hostname that was used when the Primary Applications Node was installed.

logical-host-resource

Specifies the Oracle Solaris Cluster resource that manages the logical hostname. This must be a resource of type `SUNW.LogicalHostname`.

tns-listener-resource name

Specifies an Oracle Solaris Cluster resource name for the TNS Listener. This name must be unique with Oracle Solaris Cluster.

3. Create a WebLogic Admin Server resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_admin -p service=admin_server \
-p resource_dependencies_offline_restart=storage-resource,tns-listener-resource,node-manager-resource,[scope:]db-resource \
```

-p interpose_logical_hostname=*logical host* \
-p resource_dependencies=*logical-host-resource* \
-d *admin-server-rs name*

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

tns-listener-rs

Specifies the Oracle Solaris Cluster resource for the TNS Listener resource you created earlier within this resource group.

node-manager-resource

Specifies the Oracle Solaris Cluster resource for the Node Manager resource you created earlier within this resource group.

[scope:]*db-resource*

Specifies the Oracle Solaris Cluster resource that proxies the Database status.

This must be a resource of type `SUNW.oracle_server` (single instance database), type `SUNW.scalable_rac_server_proxy` (Real Application Cluster), or type `ORCL.oracle_external_proxy` (single instance database, Real Application Cluster or database external from this cluster).

If the database status is proxied using `ORCL.oracle_external_proxy` on the same global cluster or zone cluster as the WebLogic Admin Server, you can omit the scope parameter.

If the Database and WebLogic Admin Server both reside on the same global cluster or zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, you can omit the scope parameter.

If the Database resides in the global cluster and the WebLogic Admin Server resides in the zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you must specify the scope parameter.

If the Database and WebLogic Admin Server both reside on different zone clusters and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you should specify the scope parameter.

Note - Using the scope parameter will set an inter-cluster dependency and can only be set from the global cluster. For information on setting the scope parameter and dependency, refer to "Deployment Example: How to Install and Configure Oracle E-Business Suite 12.2 or Later on Oracle Solaris Cluster".

logical-host

Specifies the logical hostname that was used when the Primary Applications Node was installed.

logical-host-resource

Specifies the Oracle Solaris Cluster resource that manages the logical hostname. This must be a resource of type `SUNW.LogicalHostname`.

admin-server-resource name

Specifies an Oracle Solaris Cluster resource name for the WebLogic Admin Server. This name must be unique with Oracle Solaris Cluster.

4. **Bring online the resource group and enable the resources.**

```
# clresourcegroup online -eM resource group
```

resource group

Specifies the resource group that you created earlier.

▼ How to Create the Web Entry Point Service Group Resources

The Web Entry Point Service Group contains services for Oracle Process Manager and Notification (OPMN) and Oracle HTTP Server (OHS). These services can be configured within a failover resource group, single-node or multi-master resource group.

1. **Create an appropriate resource group.**

For more information, see "Creating a Resource Group for Oracle E-Business Suite 12.2 or Later" on page 18.

2. **Create the OPMN resource.**

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_entry-p service=opmn \
-p resource_dependencies_offline_restart=storage-resource \
```

```
-p pmf_managed=true \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d opmn-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies an optional property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used omit this property.

logical-host-resource

Specifies an optional property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used, omit this extension property.

opmn-resource name

Specifies an Oracle Solaris Cluster resource name for the OPMN Server. This name must be unique with Oracle Solaris Cluster.

3. Create the OHS resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_entry-p service=ohs \
-p resource_dependencies_offline_restart=storage-resource \
-p resource_dependencies=opmn-resource,logical-host-resource \
[ -p interpose_logical_hostname=logical host \ ]
-d ohs-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type *SUNW.HAStoragePlus* or *SUNW.ScalMountPoint*.

opmn-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type *SUNW.HAStoragePlus* or *SUNW.ScalMountPoint*.

logical-host

Specify an optional property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this property.

logical-host-resource

Specifies an optional property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type *SUNW.LogicalHostname*. If a logical hostname was not used, omit this extension property.

opmn-resource name

Specifies an Oracle Solaris Cluster resource name for OHS. This name must be unique with Oracle Solaris Cluster.

4. Bring online the resource group and enable the resources.

```
# clresourcegroup online -eM resource group
```

resource group

Specify the resource group that you created earlier.

▼ How to Create the Web Application Service Group Resources

The Web Application Service Group contains services for TNS Listener (`tns_apps`), Oracle Applications Core (`oacore`), Oracle Applications Fusion Middleware (`oafm`), Oracle Applications Forms (forms), and Oracle Applications Forms for Web Services (`forms-c4ws`). These services can be created within a failover resource group, single-node or multi-master resource group.

1. **Create an appropriate resource group.**

   For more information, see "Creating a Resource Group for Oracle E-Business Suite 12.2 or Later" on page 18.

2. **Create a Node Manager resource.**

   When creating the Node Manger resource, ensure that you use the resource group that you created in Step 1 of this procedure.

   For more information on how to create a Node Manager resource, see "How to Create the Root Service Group Resource" on page 19.

3. **Create the `tns_apps` resource.**

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_applications -p service=tns_apps \
-p resource_dependencies_offline_restart=storage-resource \
-p pmf_managed=true \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d tns-listener-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies an optional property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this property.

logical-host-resource

Specifies an optional property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used, omit this extension property.

tns-listener-resource name

Specifies an Oracle Solaris Cluster resource name for the TNS Listener. This name must be unique with Oracle Solaris Cluster.

4. Create the `oacore` resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_applications -p service=oacore \
-p resource_dependencies=tns-listener-resource,node-manager-resource,[scope:]db-resource \
-p resource_dependencies_offline_restart=storage-resource \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d oacore-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

tns-listener-resource

Specifies the Oracle Solaris Cluster resource for the TNS Listener resource you created earlier within this resource group.

node-manager-resource

Specifies the Oracle Solaris Cluster resource for the Node Manager resource you created earlier within this resource group.

[scope:]*db-resource*

Specifies the Oracle Solaris Cluster resource that proxies the Database status.

This must be a resource of type `SUNW.oracle_server` (single instance database), type `SUNW.scalable_rac_server_proxy` (Real Application Cluster), or type `ORCL.oracle_external_proxy` (single instance database, Real Application Cluster or database external from this cluster).

If the database status is proxied using `ORCL.oracle_external_proxy` on the same global cluster or zone cluster as the WebLogic Admin Server, you can omit the scope parameter.

If both the Database and the Web Applications Service, `oacore`, both reside on the same global cluster or zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, you can omit the scope parameter.

If the Database resides in the global cluster and the Web Applications Service, `oacore`, resides in the zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you must specify the scope parameter.

If both the Database and the Web Applications Service, `oacore`, both reside on different zone clusters and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you should specify the scope parameter.

Note - Using the scope parameter will set an inter-cluster dependency and can only be set from the global cluster. For information on setting the scope parameter and dependency, refer to "Deployment Example: How to Install and Configure Oracle E-Business Suite 12.2 or Later on Oracle Solaris Cluster".

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies an optional property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this property.

logical-host-resource

Specifies an optional property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used, omit this extension property.

oacore-resource name

Specify an Oracle Solaris Cluster resource name for the `oacore` Web Application. This name must be unique with Oracle Solaris Cluster.

5. Create the `oafm` resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_applications -p service=oafm \
-p resource_dependencies=tns-listener-resource,node-manager-resource,[scope:]db-resource \
-p resource_dependencies_offline_restart=storage-resource \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d oafm-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

tns-listener-resource

Specifies the Oracle Solaris Cluster resource for the TNS Listener resource you created earlier within this resource group.

node-manager-resource

Specifies the Oracle Solaris Cluster resource for the Node Manager resource you created earlier within this resource group.

[scope:]*db-resource*

Specifies the Oracle Solaris Cluster resource that proxies the Database status.

This must be a resource of type `SUNW.oracle_server` (single instance database), type `SUNW.scalable_rac_server_proxy` (Real Application Cluster), or type `ORCL.oracle_external_proxy` (single instance database, Real Application Cluster or database external from this cluster).

If the database status is proxied using `ORCL.oracle_external_proxy` on the same global cluster or zone cluster as the WebLogic Admin Server, you can omit the scope parameter.

If both the Database and the Web Applications Service, `oafm`, both reside on the same global cluster or zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, you can omit the scope parameter.

If the Database resides in the global cluster and the Web Applications Service, `oafm`, resides in the zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you must specify the scope parameter.

If both the Database and the Web Applications Service, `oafm`, both reside on different zone clusters and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you should specify the scope parameter.

Note - Using the scope parameter will set an inter-cluster dependency and can only be set from the global cluster. For information on setting the scope parameter and dependency, refer to "Deployment Example: How to Install and Configure Oracle E-Business Suite 12.2 or Later on Oracle Solaris Cluster".

---

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies an optional property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this property.

logical-host-resource

Specifies an optional property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type SUNW.LogicalHostname. If a logical hostname was not used, omit this extension property.

oafm-resource name

Specifies an Oracle Solaris Cluster resource name for the Web Application oafm. This name must be unique with Oracle Solaris Cluster.

6. Create the `forms` resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_applications -p service=forms \
-p resource_dependencies=tns-listener-resource,node-manager-resource,[scope:]db-resource \
-p resource_dependencies_offline_restart=storage-resource \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d forms-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

tns-listener-resource

Specifies the Oracle Solaris Cluster resource for the TNS Listener resource you created earlier within this resource group.

node-manager-resource

Specifies the Oracle Solaris Cluster resource for the Node Manager resource you created earlier within this resource group.

[scope:]*db-resource*

Specifies the Oracle Solaris Cluster resource that proxies the Database status.

This must be a resource of type `SUNW.oracle_server` (single instance database), type `SUNW.scalable_rac_server_proxy` (Real Application Cluster), or type `ORCL.oracle_external_proxy` (single instance database, Real Application Cluster or database external from this cluster).

If the database status is proxied using `ORCL.oracle_external_proxy` on the same global cluster or zone cluster as the WebLogic Admin Server, you can omit the scope parameter.

If both the Database and the Web Applications Service, `forms`, both reside on the same global cluster or zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, you can omit the scope parameter.

If the Database resides in the global cluster and the Web Applications Service, `forms`, resides in the zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you must specify the scope parameter.

If both the Database and the Web Applications Service, `forms`, both reside on different zone clusters and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you should specify the scope parameter.

Note - Using the scope parameter will set an inter-cluster dependency and can only be set from the global cluster. For information on setting the scope parameter and dependency, refer to "Deployment Example: How to Install and Configure Oracle E-Business Suite 12.2 or Later on Oracle Solaris Cluster".

---

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies an optional property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this property.

logical-host-resource

Specifies an optional property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used, omit this extension property.

forms-resource name

Specify an Oracle Solaris Cluster resource name for the `forms` web application . This name must be unique with Oracle Solaris Cluster.

7. Create the `forms-c4ws` resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=web_applications -p service=forms-c4ws \
-p resource_dependencies=tns-listener-resource,node-manager-resource,[scope:]db-resource \
-p resource_dependencies_offline_restart=storage-resource \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d forms-c4ws-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

tns-listener-resource

Specifies the Oracle Solaris Cluster resource for the TNS Listener resource you created earlier within this resource group.

node-manager-resource

Specifies the Oracle Solaris Cluster resource for the Node Manager resource you created earlier within this resource group.

[scope:]*db-resource*

Specifies the Oracle Solaris Cluster resource that proxies the Database status.

This must be a resource of type `SUNW.oracle_server` (single instance database), type `SUNW.scalable_rac_server_proxy` (Real Application Cluster), or type `ORCL.oracle_external_proxy` (single instance database, Real Application Cluster or database external from this cluster).

If the database status is proxied using `ORCL.oracle_external_proxy` on the same global cluster or zone cluster as the WebLogic Admin Server, you can omit the scope parameter.

If both the Database and the Web Applications Service, `forms-c4ws`, both reside on the same global cluster or zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, you can omit the scope parameter.

If the Database resides in the global cluster and the Web Applications Service, `forms-c4ws`, resides in the zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you must specify the scope parameter.

If both the Database and the Web Applications Service, `forms-c4ws`, both reside on different zone clusters and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you should specify the scope parameter.

Note - Using the scope parameter will set an inter-cluster dependency and can only be set from the global cluster. For information on setting the scope parameter and dependency, refer to "Deployment Example: How to Install and Configure Oracle E-Business Suite 12.2 or Later on Oracle Solaris Cluster".

---

storage-resource

Specifies the Oracle Solaris Cluster resource for the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies an optional property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used omit this property.

logical-host-resource

Specifies an optional property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used, omit this extension property.

forms-c4ws-resource name

Specify an Oracle Solaris Cluster resource name for the `forms-c4ws` web application. This name must be unique with Oracle Solaris Cluster.

8. Bring online the resource group and enable the resources.

```
# clresourcegroup online -eM resource group
```

resource group

Specify the resource group that you created earlier.

▼ How to Create the Batch Service Group Resources

The Batch Service contains services for TNS Listener (tns_apps) and Concurrent Manager (concmgr). These services can be created within a failover resource group or multi-master resource group.

1. **Create an appropriate resource group.**

   For more information, see "Creating a Resource Group for Oracle E-Business Suite 12.2 or Later" on page 18.

2. **Create a `tns_apps` resource.**

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=batch -p service=tns_apps \
-p resource_dependencies_offline_restart=storage-resource \
-p pmf_managed=true \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d tns-listener-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

storage-resource

Specifies the Oracle Solaris Cluster resource that manages the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies the optional extension property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this extension property

logical-host-resource

Specifies the optional extension property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used, omit this extension property.

tns-listener-resource name

Specifies an Oracle Solaris Cluster resource name for the TNS Listener. This name must be unique with Oracle Solaris Cluster.

3. Create a `concmgr` resource.

```
# clresource create -g resource group -t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=batch -p service=concmgr \
-p resource_dependencies=tns-listener-resource,[scope:]db-resource \
-p resource_dependencies_offline_restart=storage-resource \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d concmgr-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

tns-listener-resource

Specifies the Oracle Solaris Cluster resource that manages the TNS Listener resource you created earlier within this resource group.

[scope:]*db-resource*

Specifies the Oracle Solaris Cluster resource that proxies the Database status. This must be a resource of type `SUNW.oracle_server` (single instance database), type `SUNW.scalable_rac_server_proxy` (Real Application Cluster), or type `ORCL.oracle_external_proxy` (single instance database, Real Application Cluster or database external from this cluster).

If the database status is proxied using `ORCL.oracle_external_proxy` on the same global cluster or zone cluster as the WebLogic Admin Server, you can omit the scope parameter.

If the Database and Concurrent Manager both reside on the same global cluster or zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, you can omit the scope parameter.

If the Database resides in the global cluster and the Concurrent Manager resides in the zone cluster and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you must specify the scope parameter.

If the Database and Concurrent Manager both reside on different zone clusters and the database status is proxied using `SUNW.oracle_server` or `SUNW.scalable_rac_server_proxy`, then you should specify the scope parameter.

Note - Using the scope parameter will set an inter-cluster dependency and can only be set from the global cluster. For information on setting the scope parameter and dependency, refer to "Deployment Example: How to Install and Configure Oracle E-Business Suite 12.2 or Later on Oracle Solaris Cluster".

---

storage-resource

Specifies the Oracle Solaris Cluster resource that manages the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies the optional extension property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this extension property

logical-host-resource

Specifies the optional extension property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used omit this extension property.

tns-listener-resource name

Specifies an Oracle Solaris Cluster resource name for the Concurrent manager. This name must be unique with Oracle Solaris Cluster.

4. Bring online the resource group and enable the resources.

```
# clresourcegroup online -eM resource group
```

resource group

Specifies the resource group that you created earlier.

▼ How to Create the Other Service Group Resource

The Other Service contains a service for Forms Server Socket Mode (`forms_server`) This service can be created within a failover resource group or multi-master resource group.

1. **Create an appropriate resource group.**

   For more information, see "Creating a Resource Group for Oracle E-Business Suite 12.2 or Later" on page 18.

2. **Create a `forms_server` resource.**

```
# clresource create -g resource group \
-t ORCL.ebs \
-p base_dir=apps base dir \
-p service_group=other -p service=forms_server \
-p resource_dependencies_offline_restart=storage-resource \
-p pmf_managed=true \
[ -p interpose_logical_hostname=logical host \ ]
[ -p resource_dependencies=logical-host-resource \ ]
-d forms-srv-resource name
```

resource group

Specifies the resource group that you created earlier.

apps base dir

Specifies the Oracle E-Business Suite Apps Base Directory. For example, *apps base dir*`/EBSapps.env`.

storage-resource

Specifies the Oracle Solaris Cluster resource that manages the Shared Application Tier File System. This must be a resource of type `SUNW.HAStoragePlus` or `SUNW.ScalMountPoint`.

logical-host

Specifies the optional extension property to identify the logical hostname, that was used when the Primary Applications Node or Secondary Node was installed using an Oracle Solaris Cluster logical host. If a logical hostname was not used, omit this extension property

logical-host-resource

Specifies the optional extension property to identify the Oracle Solaris Cluster resource name for the logical hostname. This must be a resource of type `SUNW.LogicalHostname`. If a logical hostname was not used, omit this extension property.

forms-srv-resource name

Specifies an Oracle Solaris Cluster resource name for the Forms Server (Socket mode). This name must be unique with Oracle Solaris Cluster.

3. **Bring online the resource group and enable the resource.**

```
# clresourcegroup online -eM resource group
```

resource group

Specify the resource group that you created earlier.

Verifying the HA for Oracle E-Business Suite 12.2 or Later Installation and Configuration

This section contains the procedure you need to verify that you installed and configured your data service correctly.

After Oracle E-Business Suite 12.2.4 and AD/TXK C.Delta.6 or later has been installed, you must verify that the services can be manually started and stopped before creating Oracle Solaris Cluster resources of type `ORCL.ebs`.

▼ How to Verify the HA for Oracle E-Business Suite 12.2 or Later Installation and Configuration

1. **On a cluster member, become an administrator that provides `solaris.cluster.modify` authorization.**

2. **Ensure that all the Oracle E-Business Suite 12.2 or later resources are online.**

```
# cluster status
```

Enable any Oracle E-Business Suite 12.2 or later resources that are not online.

```
# clresource enable oracle-ebusiness-suite-resource
```

3. **Switch the Oracle E-Business Suite 12.2 or later resource group that contains the WebLogic Admin Server to another cluster node.**

```
# clresourcegroup switch -n node oracle-ebusiness-suite-admin-server-resourcegroup
```

Upgrading to HA for Oracle E-Business Suite 12.2 or Later

Upgrade to HA for Oracle E-Business Suite 12.2 or later data service if the following conditions apply:

- You are upgrading from an earlier version of the HA for Oracle E-Business Suite 12.2 or later data service.
- You need to use the new features of this data service.

▼ How to Upgrade to the New Version of HA for Oracle E-Business Suite 12.2 or Later

You must perform all the steps within this procedure.

Note - Before performing this procedure you should consider if your current Oracle E-Business Suite 12.2 or later resources have been modified to have specific timeout values that suit your deployment. If timeout values were previously adjusted you should reapply those timeout values to your new Oracle E-Business Suite 12.2 or later resources.

---

1. **On a cluster member, become an administrator that provides `solaris.cluster.modify` authorization.**

2. **Register the new `ORCL.ebs` resource type.**

   For more information, see "Registering and Configuring the `ORCL.ebs` Resource Type" on page 18.

3. **Determine the version of the `ORCL.ebs` resource type that is currently being used by resources of type `ORCL.ebs`.**

   ```
   # clrs show -p type -p type_version resource
   ```

   For example:

   ```
   # clrs show -p type -p type_version ebs-mm-nm-rs
   ```

4. **Determine the new version of the resource type that is related to `ORCL.ebs`.**

Note - In the example output below, `ORCL.ebs:2` is just an example and does not currently exist.

```
# clrt list | grep ORCL.ebs
ORCL.ebs:1
ORCL.ebs:2
```

5. Upgrade to the new `ORCL.ebs` resource type version.

a. Check the upgrade directive from the new ORCL.ebs resource registration file.

```
# grep upgrade /opt/ORCLscebs/etc/ORCL.ebs
#$upgrade
#$upgrade_from "1" ANYTIME
```

Note - The upgrade directive for the appropriate version can be one of the following values:

- ANYTIME
- AT_CREATION
- WHEN_DISABLED
- WHEN_OFFLINE
- WHEN_UNMANAGED
- WHEN_UNMONITORED

b. Upgrade to the new `ORCL.ebs` resource type version.

You must adhere to the upgrade directive before upgrading to the new `ORCL.ebs` resource type version.

For example, if the upgrade directive is WHEN_DISABLED, you must disable your resource before upgrading to the new `ORCL.ebs` resource type version.

If the upgrade directive is AT_CREATION you must disable and delete the resource and then recreate the resource with the new resource type version.

Once you have adhered to the upgrade directive, upgrade your resource of type `ORCL.ebs` as follows:

```
# clresource set -p Type_version=new version  resource
```

Note - If you are upgrading from an earlier version of HA for Oracle E-Business Suite data service, that is from Oracle E-Business Suite 12.1.x, you must disable and delete your old resources and register new resources of type `ORCL.ebs`.

Tuning the HA for Oracle E-Business Suite 12.2 or Later Fault Monitor

This section describes the HA for Oracle E-Business Suite 12.2 or later fault monitor's probing algorithm or functionality, and states the conditions and recovery actions associated with unsuccessful probing.

Resource Properties

The HA for Oracle E-Business Suite 12.2 or later fault monitor uses the resource properties that are specified in the resource type ORCL.ebs. Refer to the r_properties(5) man page for a list of general resource properties used. Refer to the ORCL.ebs(5) man page Extension Properties for a specific list of resource properties for this resource type.

Probing Algorithm and Functionality

The HA for Oracle E-Business Suite 12.2 or later is controlled by extension properties that control the probing frequency. The default values of these properties determine the preset behavior of the fault monitor and are suitable for most Oracle Solaris Cluster installations. You can modify this preset behavior by modifying the following settings:

- The interval between fault monitor probes (Thorough_probe_interval)
- The timeout for fault monitor probes (Probe_timeout)
- The number of times the fault monitor attempts to restart the resource (Retry_count)

The HA for Oracle E-Business Suite 12.2 or later fault monitor checks services within an infinite loop. During each cycle, the fault monitor checks the service state and reports either a partial or complete failure or success.

- If the fault monitor is successful, it returns to the infinite loop and continues the next cycle of probing and sleeping.

- If the fault monitor reports a complete failure, a request is made to the cluster to restart the resource. If the fault monitor reports another complete failure, another request is made to the cluster to restart the resource. This behavior continues whenever the fault monitor reports a complete failure. If successive restarts exceed the Retry_count within the Thorough_probe_interval, a request is made to fail over the resource group onto a different node.
- If the fault monitor reports a partial failure, the return code value is used to sum successive partial failures. Once successive summed partial failures reaches or exceeds 100 a complete failure is declared.

Operations of the Fault Monitor

All service fault monitors check the following:

- That the RUN File System can be sourced by the Apps OS User.
- That various entries from the Application Tier's context file can be retrieved. If it is not possible to performs these checks, a complete failure is declared.

The following sections describe the operations of the fault monitor.

Node Manager Fault Monitor

Checks that the Node Manager process ID exists for the Application Tier. If the process ID does not exist a complete failure is declared.

As the OS Apps User, the WebLogic Scripting Tool is used to connect to and then disconnect from the Node Manager using the Node Manager Port value (nm_port value from the Application Tier's context file).

If it is possible to successfully connect to the Node Manager, the fault monitor reports a success. Otherwise a complete failure is declared.

WebLogic Admin Server Fault Monitor

Checks that the WebLogic Admin Server process ID exists for the Application Tier. If the process ID does not exist a complete failure is declared.

As the OS Apps User, the WebLogic Scripting Tool is used to connect to the Admin Server using the Admin Server Port value (wls_adminport value from the Application Tier's context

file). Once connected, it obtains the state of the Admin Server and then disconnects from the Admin Server.

If it is not possible to connect using the WebLogic Scripting Tool, the `${EBS_DOMAIN_HOME}/servers/AdminServer/data/nodemanager/AdminServer.state` file is used to determine the state.

If the state is RUNNING, then the fault monitor reports a success.

If the state is STARTING, the fault monitor reports a partial failure value of 10. Successive fault monitor partial failures are summed up and as soon as a value of 100 is reached, a complete failure is declared.

If the state is STANDBY, ADMIN, RESUMING, FAILED_RESTARTING, or ADMIN_ON_ABORTED_STARTUP, the fault monitor reports a partial failure value of 20. Successive fault monitor partial failures are summed up and as soon as a value of 100 is reached, a complete failure is declared. If the state is any other value, a complete failure is declared.

TNS Listener Fault Monitor

Checks that the TNS Listener process ID exists for the Application Tier. If the process ID does not exist, a complete failure is declared.

As the OS Apps User, the `lsnrctl status ${FNDNAM}_${dbSid}` command is used to determine the status of the TNS Listener. Values for FNDNAM and dbSid are derived from the Application Tier's context file.

If the status is RUNNING, the fault monitor reports a success. Otherwise, a complete failure is declared.

Oracle Process Manager Fault Monitor

Checks that the Oracle Process Manager process ID exists for the Application Tier. If the process ID does not exist, a complete failure is declared.

As the OS Apps User, the `${ohs_instance_loc}/opmnctl ping` command is used to determine the status of the Oracle Process Manager status. The value for ohs_instance_loc is derived from the Application Tier's context file.

If the ping is successful, the fault monitor reports a success. Otherwise a complete failure is declared.

Oracle HTTP Server Fault Monitor

Checks that Oracle HTTP process ID exists for the Application Tier. If the process ID does not exist, a complete failure is declared.

As the OS Apps User, the `opmnctl status ias-component=${ohs_component}` command is used to determine the status of the Oracle HTTP Server status. The value for ohs_component is derived from the Application Tier's context file.

If the status is ALIVE, the fault monitor reports a success.

If the status is INIT, the fault monitor reports a partial failure value of 50. Successive fault monitor partial failures are summed up and as soon a value of 100 is reached, a complete failure is declared.

If the status is any other value, a complete failure is declared.

Web Application Services (oacore, oafm, forms, and forms-c4ws) Fault Monitor

Checks that the Web Application Service process ID exists for the Application Tier. If the process ID does not exist, a complete failure is declared.

As the OS Apps User, the WebLogic Scripting Tool is used to connect to the Web Application Service using the Web Application Service Port value (wls_*service* port value from the Application Tier's context file). Once connected, it obtains the state of the Web Application Service and then disconnects from the Web Application Service.

If it is not possible to connect using the WebLogic Scripting Tool, the `${EBS_DOMAIN_HOME}/servers/`*service*`_servern/data/nodemanager/`*service*`_servern.state` file is used to determine the state.

If the state is RUNNING, the fault monitor reports a success.

If the state is STARTING, the fault monitor reports a partial failure value of 10. Successive fault monitor partial failures are summed up and as soon as a value of 100 is reached, a complete failure is declared.

If the state is STANDBY, ADMIN, RESUMING, FAILED_RESTARTING, or ADMIN_ON_ABORTED_STARTUP, the fault monitor reports a partial failure value of 20. Successive fault monitor partial failures are summed up and as soon as a value of 100 is reached, a complete failure is declared.

If the state is any other value, a complete failure is declared.

Concurrent Manager Fault Monitor

As the APPS User, connect to the database using SQL*Plus to determine the actual and target Concurrent Manager OS process IDs.

When 2 or more actual process IDs are found, the fault monitor reports a success. Otherwise, a complete failure is declared.

If the status is any other value, a complete failure is declared.

Forms Server Fault Monitor

Checks that the Forms Server process ID exists for the Application Tier. If the process ID does not exist a complete failure is declared.

Deployment Example: How to Install and Configure Oracle E-Business Suite 12.2 or Later on Oracle Solaris Cluster

Installing and Configuring Oracle E-Business Suite 12.2 or Later on Oracle Solaris Cluster

This deployment example demonstrates a working example of Oracle E-Business Suite 12.2.4 with technology stack (TXK) and Applications Database (AD) C.Delta.6 on Oracle Solaris Cluster.

This deployment example is based on the information available in the "Deployment Option with Single Web Entry Point and Multiple Managed Servers" section of the `My Oracle Support` (MOS) note, Using Load-Balancers with Oracle E-Business Suite Release 12.2 (Doc ID 1375686.1), with the modification that the Admin Server and its Node Manager are running on the Web Entry Point server.

The deployment example uses two Oracle Solaris Cluster nodes `psmash1` and `psmash2`. There are also two zone clusters, `zc1` and `zc2`, deployed across those two nodes. The respective zone nodes are `vzsmash1` and `vzsmash2` for `zc1` and `vzsmash1b` and `vzsmash2b` for `zc2`. Oracle E-Business Suite 12.2.4 services are deployed as follows:

- The Primary Applications Node, hosting the HTTP Server and WebLogic Admin Server, has been installed using logical host `smash-6` which is deployed within zone cluster `zc1` (`vzsmash1` and `vzsmash2`).
- Web Applications are deployed on Secondary Application Nodes within the global cluster (`psmash1` and `psmash2`).
- Concurrent Managers are deployed on Secondary Application Nodes within zone cluster `zc2` (`vzsmash1b` and `vzsmash2b`).

Oracle Solaris Cluster Resources That Are Already Set USp

The following Oracle Solaris Cluster resources have already been set up that include Oracle Grid Infrastructure for the Cluster, Oracle ASM, and Oracle RAC.

```
root@psmash1:~# clresource status

=== Cluster Resources ===

Resource Name       Node Name       State       Status Message
-------------       ---------       -----       --------------
crs-fmwk-rs         psmash2         Online      Online
                    psmash1         Online      Online

rac-fmwk-rs         psmash2         Online      Online
                    psmash1         Online      Online

asm-inst-rs         psmash2         Online      Online - +ASM2 is UP and ENABLED
                    psmash1         Online      Online - +ASM1 is UP and ENABLED

asm-dg-rs           psmash2         Online      Online - Mounted: DATA
                    psmash1         Online      Online - Mounted: DATA

oep-rs              psmash2         Online      Online - Service VIS is UP [Instance is
 OPEN]
                    psmash1         Online      Online - Service VIS is UP [Instance is
 OPEN]

root@psmash1:~#
```

Oracle Solaris Cluster Zone Clusters `zc1` and `zc2`

The following Oracle Solaris Cluster Zone Clusters have been installed and configured with the Shared Application Tier File System (`/global/ebs`) and logical host (`smash-6`) on `zc1`.

```
root@psmash1:~# clzonecluster status

=== Zone Clusters ===

--- Zone Cluster Status ---

Name   Brand     Node Name   Zone Host Name   Status   Zone Status
----   -----     ---------   --------------   ------   -----------
```

```
zc1    solaris   psmash1     vzsmash1         Online   Running
                 psmash2     vzsmash2         Online   Running

zc2    solaris   psmash1     vzsmash1b        Online   Running
                 psmash2     vzsmash2b        Online   Running

root@psmash1:~#

root@psmash1:~# clzonecluster configure zc1
clzc:zc1> info fs
fs:
 dir: /global/ebs
 special: /global/ebs
 raw not specified
 type: lofs
 options: []
 cluster-control: true
clzc:zc1> info net
net:
 address: smash-6
 physical: auto
clzc:zc1> exit
root@psmash1:~#
root@psmash1:~# clzonecluster configure zc2
clzc:zc2> info fs
fs:
 dir: /global/ebs
 special: /global/ebs
 raw not specified
 type: lofs
 options: []
 cluster-control: true
clzc:zc2> info net
clzc:zc2> exit
root@psmash1:~#
```

Registering the `SUNW.HAStoragePlus` Resource Type

Create a storage resource to manage the `/global/ebs/VIS` Shared Application File System. The following `/etc/vfstab` entry exists on `psmash1` and `psmash2` and mount points exist for `/global/ebs` on `psmash1`, `psmash2`, `vzsmash1`, `vzsmash2`, `vzsmash1b` and `vzsmash2b`.

```
/dev/md/dg1/dsk/d100 /dev/md/dg1/rdsk/d100 /global/ebs ufs 3 yes global,logging

root@psmash1:~# clresourcetype register SUNW.HAStoragePlus
root@psmash1:~# clresourcetype register -Z zc1 SUNW.HAStoragePlus
```

```
root@psmash1:~# clresourcetype register -Z zc2 SUNW.HAStoragePlus
root@psmash1:~#
root@psmash1:~# clresourcegroup create -S hasp-rg
root@psmash1:~#
root@psmash1:~# clresourcegroup create -S -Z zc1 \
-p RG_Affinities=++global:hasp-rg hasp-rg
root@psmash1:~#
root@psmash1:~# clresourcegroup create -S -Z zc2 \
-p RG_Affinities=++global:hasp-rg hasp-rg
root@psmash1:~#
root@psmash1:~# clresource create -g hasp-rg -t SUNW.HAStoragePlus \
-p FileSystemMountPoints=/global/ebs -d hasp-rs
root@psmash1:~#
root@psmash1:~# clresourcegroup online -eM hasp-rg
root@psmash1:~#
root@psmash1:~# clresource create -Z zc1 -g hasp-rg -t SUNW.HAStoragePlus \
-p FileSystemMountPoints=/global/ebs \
-p resource_dependencies_offline_restart=global:hasp-rs -d hasp-rs
root@psmash1:~#
root@psmash1:~# clresource create -Z zc2 -g hasp-rg -t SUNW.HAStoragePlus \
-p FileSystemMountPoints=/global/ebs \
-p resource_dependencies_offline_restart=global:hasp-rs -d hasp-rs
root@psmash1:~#
root@psmash1:~# clresourcegroup online -eM -Z zc1 hasp-rg
root@psmash1:~# clresourcegroup online -eM -Z zc2 hasp-rg
root@psmash1:~# clresource status -Z all -g hasp-rg

=== Cluster Resources ===

Resource Name       Node Name       State       Status Message
-------------       ---------       -----       --------------
hasp-rs             psmash2         Online      Online
                    psmash1         Online      Online

hasp-rs             vzsmash2        Online      Online
                    vzsmash1        Online      Online

hasp-rs             vzsmash2b       Online      Online
                    vzsmash1b       Online      Online

root@psmash1:~#
```

Verifying the Oracle E-Business Suite Installation

In subsequent steps, you will create resources of type `ORCL.ebs`. Once created, these resources will manage the start and stop of various Oracle E-Business Suite 12.2.4 services. However,

before creating these resources, you must ensure that those services can be manually started and stopped.

On the Primary Applications Node (`smash-6`), manually start and stop the following services:

- OPMN
- Oracle HTTP Server
- TNS Listener
- Node Manager
- WebLogic Admin Server

Note - `/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/appl/admin/customVIS_smash-6.env` reflects `${INST_TOP}/appl/admin/customglobal_db-name_logical host.env` as described in "Interpose Logical Host" on page 14.

```
root@psmash1:~# zlogin zc1
[Connected to zone 'zc1' pts/6]
?Oracle Corporation SunOS 5.11 11.2 April 2015
You have new mail.
root@vzsmash1:~# su - applvis
Oracle Corporation SunOS 5.11 11.2 April 2015
You have new mail.
-bash-4.1$ cd /global/ebs/VIS
-bash-4.1$
-bash-4.1$ cat /global/ebs/VIS/fs2/inst/apps/VIS_smash-6/appl/admin/
customVIS_smash-6.env
export LD_PRELOAD_32=/usr/lib/secure/libschost.so.1
export LD_PRELOAD_64=/usr/lib/secure/64/libschost.so.1
export SC_LHOSTNAME=smash-6

-bash-4.1$ . /global/ebs/VIS/fs2/inst/apps/VIS_smash-6/appl/admin/customVIS_smash-6.env
-bash-4.1$ uname -n
smash-6
-bash-4.1$
-bash-4.1$ . EBSapps.env run

  E-Business Suite Environment Information
  ----------------------------------------
  RUN File System           : /global/ebs/VIS/fs2/EBSapps/appl
  PATCH File System         : /global/ebs/VIS/fs1/EBSapps/appl
  Non-Editioned File System : /global/ebs/VIS/fs_ne


  DB Host: psmash1.us.oracle.com  Service/SID: VIS
```

```
  Sourcing the RUN File System ...

-bash-4.1$ cd $ADMIN_SCRIPTS_HOME
-bash-4.1$
-bash-4.1$ ./adalnctl.sh start

adalnctl.sh version 120.3.12020000.2

Checking for FNDFS executable.
Starting listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adalnctl.txt \
for more information ...

-bash-4.1$
-bash-4.1$ ./adopmnctl.sh start

You are running adopmnctl.sh version 120.0.12020000.2

Starting Oracle Process Manager (OPMN) ...

adopmnctl.sh: exiting with status 0

adopmnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adopmnctl.txt \
for more information ...

-bash-4.1$
-bash-4.1$ ./adapcctl.sh start

You are running adapcctl.sh version 120.0.12020000.6

Starting OPMN managed Oracle HTTP Server (OHS) instance ...

adapcctl.sh: exiting with status 0

adapcctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adapcctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adnodemgrctl.sh start

You are running adnodemgrctl.sh version 120.11.12020000.11
```

```
Enter the WebLogic Admin password:
Starting the Node Manager...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adnodemgrctl.txt for
 details

adnodemgrctl.sh: exiting with status 0

adnodemgrctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adnodemgrctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adadminsrvctl.sh start

You are running adadminsrvctl.sh version 120.10.12020000.9

Enter the WebLogic Admin password:
Enter the APPS Schema password:
Starting WLS Admin Server...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adadminsrvctl.txt
 for details

adadminsrvctl.sh: exiting with status 0

adadminsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adadminsrvctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adadminsrvctl.sh stop

You are running adadminsrvctl.sh version 120.10.12020000.9

Enter the WebLogic Admin password:
Enter the APPS Schema password:
Stopping WLS Admin Server...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adadminsrvctl.txt
 for details

adadminsrvctl.sh: exiting with status 0

adadminsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adadminsrvctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adnodemgrctl.sh stop
```

```
You are running adnodemgrctl.sh version 120.11.12020000.11

Enter the WebLogic Admin password:

adnodemgrctl.sh: exiting with status 0

adnodemgrctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adnodemgrctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adapcctl.sh stop

You are running adapcctl.sh version 120.0.12020000.6

Stopping OPMN managed Oracle HTTP Server (OHS) instance ...

adapcctl.sh: exiting with status 0

adapcctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adapcctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adopmnctl.sh stop

You are running adopmnctl.sh version 120.0.12020000.2

Stopping Oracle Process Manager (OPMN)  and the managed processes ...

adopmnctl.sh: exiting with status 0

adopmnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adopmnctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adalnctl.sh stop

adalnctl.sh version 120.3.12020000.2

Shutting down listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
```

```
/global/ebs/VIS/fs2/inst/apps/VIS_smash-6/logs/appl/admin/log/adalnctl.txt for more
 information ...

-bash-4.1$
```

On the Secondary Application Nodes (`psmash1` and `psmash2`), manually start and stop the following services:

- TNS Listener
- Node Manager
- Web Applications oacore
- Web Applications oafm
- Web Applications forms
- Web Applications forms-c4ws

Note - You must be able to manually start these managed server in managed server independence mode on both nodes. A managed server can only be started in MSI mode provided it was started in non-MSI mode at least once after being created.

Note - The following commands were executed on node `psmash1`.

```
root@psmash1:~# su - applvis
Oracle Corporation SunOS 5.11 11.2 April 2015
You have new mail.
-bash-4.1$ cd /global/ebs/VIS
-bash-4.1$ . EBSapps.env run

  E-Business Suite Environment Information
  ----------------------------------------
  RUN File System           : /global/ebs/VIS/fs2/EBSapps/appl
  PATCH File System         : /global/ebs/VIS/fs1/EBSapps/appl
  Non-Editioned File System : /global/ebs/VIS/fs_ne


  DB Host: psmash1.us.oracle.com  Service/SID: VIS


  Sourcing the RUN File System ...

-bash-4.1$ cd $ADMIN_SCRIPTS_HOME
-bash-4.1$
-bash-4.1$ ./adalnctl.sh start

adalnctl.sh version 120.3.12020000.2
```

```
Checking for FNDFS executable.
Starting listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adalnctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adnodemgrctl.sh start

You are running adnodemgrctl.sh version 120.11.12020000.11

Enter the WebLogic Admin password:
Starting the Node Manager...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adnodemgrctl.txt for
 details

adnodemgrctl.sh: exiting with status 0

adnodemgrctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adnodemgrctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh start oacore_server2 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:

Calling txkChkEBSDependencies.pl to perform dependency checks for oacore_server2
*** ALL THE FOLLOWING FILES ARE REQUIRED FOR RESOLVING RUNTIME ERRORS
*** Log File = \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/rgf/TXK/
txkChkEBSDependencies_Thu_Jun_4_07_34_45_2015/ \
txkChkEBSDependencies_Thu_Jun_4_07_34_45_2015.log
Perl script txkChkEBSDependencies.pl got executed successfully


Starting oacore_server2...

admanagedsrvctl.sh: exiting with status 0
```

```
admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adoacorectl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh start oafm_server2 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:

Calling txkChkEBSDependencies.pl to perform dependency checks for oafm_server2
*** ALL THE FOLLOWING FILES ARE REQUIRED FOR RESOLVING RUNTIME ERRORS
*** Log File = \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/rgf/TXK/
txkChkEBSDependencies_Thu_Jun_4_07_40_32_2015/ \
txkChkEBSDependencies_Thu_Jun_4_07_40_32_2015.log
Perl script txkChkEBSDependencies.pl got executed successfully


Starting oafm_server2...

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adoafmctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh start forms_server2 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:

Calling txkChkEBSDependencies.pl to perform dependency checks for forms_server2
*** ALL THE FOLLOWING FILES ARE REQUIRED FOR RESOLVING RUNTIME ERRORS
*** Log File = \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/rgf/TXK/
txkChkEBSDependencies_Thu_Jun_4_07_43_24_2015/ \
txkChkEBSDependencies_Thu_Jun_4_07_43_24_2015.log
Perl script txkChkEBSDependencies.pl got executed successfully
```

```
Starting forms_server2...

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile /global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/
appl/admin/log/adformsctl.txt \
for more information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh start forms-c4ws_server2 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:

Calling txkChkEBSDependencies.pl to perform dependency checks for forms-c4ws_server2
*** ALL THE FOLLOWING FILES ARE REQUIRED FOR RESOLVING RUNTIME ERRORS
*** Log File = \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/rgf/TXK/
txkChkEBSDependencies_Thu_Jun_4_07_45_14_2015/ \
txkChkEBSDependencies_Thu_Jun_4_07_45_14_2015.log
Perl script txkChkEBSDependencies.pl got executed successfully


Starting forms-c4ws_server2...

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile /global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/
appl/admin/log/adforms-c4wsctl.txt \
for more information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh stop forms-c4ws_server2 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:
Stopping forms-c4ws_server2...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adforms-c4wsctl.txt
 for details

admanagedsrvctl.sh: exiting with status 0
```

```
admanagedsrvctl.sh: check the logfile /global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/
appl/admin/log/adforms-c4wsctl.txt \
for more information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh stop forms_server2 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:
Stopping forms_server2...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adformsctl.txt for
 details

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adformsctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh stop oafm_server2 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:
Stopping oafm_server2...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adoafmctl.txt for
 details

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adoafmctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh stop oacore_server2 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:
```

```
Stopping oacore_server2...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adoacorectl.txt for
 details

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adoacorectl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adnodemgrctl.sh stop

You are running adnodemgrctl.sh version 120.11.12020000.11

Enter the WebLogic Admin password:

adnodemgrctl.sh: exiting with status 0

adnodemgrctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adnodemgrctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adalnctl.sh stop

adalnctl.sh version 120.3.12020000.2

Shutting down listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash1/logs/appl/admin/log/adalnctl.txt for more
 information ...

-bash-4.1$

Note - The following commands were executed on node psmash2.

root@psmash2:~# su - applvis
Oracle Corporation SunOS 5.11 11.2 April 2015
-bash-4.1$ cd /global/ebs/VIS
-bash-4.1$ . EBSapps.env run

  E-Business Suite Environment Information
  ----------------------------------------
```

```
  RUN File System           : /global/ebs/VIS/fs2/EBSapps/appl
  PATCH File System         : /global/ebs/VIS/fs1/EBSapps/appl
  Non-Editioned File System : /global/ebs/VIS/fs_ne


  DB Host: psmash2.us.oracle.com  Service/SID: VIS


  Sourcing the RUN File System ...

-bash-4.1$ cd $ADMIN_SCRIPTS_HOME
-bash-4.1$ ./adalnctl.sh start

adalnctl.sh version 120.3.12020000.2

Checking for FNDFS executable.
Starting listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adalnctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adnodemgrctl.sh start

You are running adnodemgrctl.sh version 120.11.12020000.11

Enter the WebLogic Admin password:
Starting the Node Manager...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adnodemgrctl.txt for
 details

adnodemgrctl.sh: exiting with status 0

adnodemgrctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adnodemgrctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh start oacore_server3 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y
```

```
Enter the WebLogic Admin password:

Calling txkChkEBSDependencies.pl to perform dependency checks for oacore_server3
*** ALL THE FOLLOWING FILES ARE REQUIRED FOR RESOLVING RUNTIME ERRORS
*** Log File = \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/rgf/TXK/
txkChkEBSDependencies_Thu_Jun_4_07_43_10_2015/ \
txkChkEBSDependencies_Thu_Jun_4_07_43_10_2015.log
Perl script txkChkEBSDependencies.pl got executed successfully


Starting oacore_server3...

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adoacorectl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh start oafm_server3 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:

Calling txkChkEBSDependencies.pl to perform dependency checks for oafm_server3
*** ALL THE FOLLOWING FILES ARE REQUIRED FOR RESOLVING RUNTIME ERRORS
*** Log File = \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/rgf/TXK/
txkChkEBSDependencies_Thu_Jun_4_07_48_50_2015/ \
txkChkEBSDependencies_Thu_Jun_4_07_48_50_2015.log
Perl script txkChkEBSDependencies.pl got executed successfully


Starting oafm_server3...

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adoafmctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh start forms_server3 -msimode
```

```
You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:

Calling txkChkEBSDependencies.pl to perform dependency checks for forms_server3
*** ALL THE FOLLOWING FILES ARE REQUIRED FOR RESOLVING RUNTIME ERRORS
*** Log File = \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/rgf/TXK/
txkChkEBSDependencies_Thu_Jun_4_07_51_49_2015/ \
txkChkEBSDependencies_Thu_Jun_4_07_51_49_2015.log
Perl script txkChkEBSDependencies.pl got executed successfully


Starting forms_server3...

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adformsctl.txt for more
 information ...

-bash-4.1$ ./admanagedsrvctl.sh start forms-c4ws_server3 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:

Calling txkChkEBSDependencies.pl to perform dependency checks for forms-c4ws_server3
*** ALL THE FOLLOWING FILES ARE REQUIRED FOR RESOLVING RUNTIME ERRORS
*** Log File = \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/rgf/TXK/
txkChkEBSDependencies_Thu_Jun_4_07_56_23_2015/ \
txkChkEBSDependencies_Thu_Jun_4_07_56_23_2015.log
Perl script txkChkEBSDependencies.pl got executed successfully


Starting forms-c4ws_server3...

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adforms-c4wsctl.txt for
 more information ...
```

```
-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh stop forms-c4ws_server3 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:
Stopping forms-c4ws_server3...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adforms-c4wsctl.txt
 for details

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adforms-c4wsctl.txt for
 more information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh stop forms_server3 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:
Stopping forms_server3...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adformsctl.txt for
 details

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adformsctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh stop oafm_server3 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:
Stopping oafm_server3...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adoafmctl.txt for
 details
```

```
admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adoafmctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./admanagedsrvctl.sh stop oacore_server3 -msimode

You are running admanagedsrvctl.sh version 120.14.12020000.10

Setting MS_INDEPENDENT_MODE to Y

Enter the WebLogic Admin password:
Stopping oacore_server3...
Refer /global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adoacorectl.txt for
 details

admanagedsrvctl.sh: exiting with status 0

admanagedsrvctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adoacorectl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adnodemgrctl.sh stop

You are running adnodemgrctl.sh version 120.11.12020000.11

Enter the WebLogic Admin password:

adnodemgrctl.sh: exiting with status 0

adnodemgrctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adnodemgrctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adalnctl.sh stop

adalnctl.sh version 120.3.12020000.2

Shutting down listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
```

```
/global/ebs/VIS/fs2/inst/apps/VIS_psmash2/logs/appl/admin/log/adalnctl.txt for more
 information ...

-bash-4.1$
```

On the Secondary Applications Nodes (`vzsmash1b` and `vzsmash2b`), manually start and stop the following services:

- TNS Listener
- Concurrent Manager

Note - The following commands were executed on the zone cluster node `vzsmash1b`.

```
root@vzsmash1b:~# su - applvis
Oracle Corporation SunOS 5.11 11.2 April 2015
-bash-4.1$ cd /global/ebs/VIS
-bash-4.1$ . EBSapps.env run

  E-Business Suite Environment Information
  ----------------------------------------
  RUN File System           : /global/ebs/VIS/fs2/EBSapps/appl
  PATCH File System         : /global/ebs/VIS/fs1/EBSapps/appl
  Non-Editioned File System : /global/ebs/VIS/fs_ne


  DB Host: psmash1.us.oracle.com  Service/SID: VIS


  Sourcing the RUN File System ...

-bash-4.1$
-bash-4.1$ cd $ADMIN_SCRIPTS_HOME
-bash-4.1$ ./adalnctl.sh start

adalnctl.sh version 120.3.12020000.2

Checking for FNDFS executable.
Starting listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_vzsmash1b/logs/appl/admin/log/adalnctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adcmctl.sh start
```

```
cp wait parameter passed with value: N


You are running adcmctl.sh version 120.19.12020000.4


Enter the APPS username : apps

Enter the APPS password :
Starting concurrent manager for VIS ...
Starting VIS_0612@VIS Internal Concurrent Manager
Default printer is noprint

adcmctl.sh: exiting with status 0


adcmctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_vzsmash1b/logs/appl/admin/log/adcmctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adcmctl.sh abort
cp wait parameter passed with value: N


You are running adcmctl.sh version 120.19.12020000.4


Enter the APPS username : apps

Enter the APPS password :
Aborting concurrent managers for VIS ...
ORACLE Password:
Submitted request 7443008 for CONCURRENT FND ABORT


adcmctl.sh: exiting with status 0


adcmctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_vzsmash1b/logs/appl/admin/log/adcmctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adalnctl.sh stop

adalnctl.sh version 120.3.12020000.2
```

```
Shutting down listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_vzsmash1b/logs/appl/admin/log/adalnctl.txt for more
 information ...

-bash-4.1$
```

Note - The following commands were executed on the zone cluster node vzsmash2b.

```
root@vzsmash2b:~# su - applvis
Oracle Corporation SunOS 5.11 11.2 April 2015
-bash-4.1$ cd /global/ebs/VIS
-bash-4.1$ . EBSapps.env run

  E-Business Suite Environment Information
  ----------------------------------------
  RUN File System           : /global/ebs/VIS/fs2/EBSapps/appl
  PATCH File System         : /global/ebs/VIS/fs1/EBSapps/appl
  Non-Editioned File System : /global/ebs/VIS/fs_ne


  DB Host: psmash1.us.oracle.com  Service/SID: VIS


  Sourcing the RUN File System ...

-bash-4.1$ cd $ADMIN_SCRIPTS_HOME
-bash-4.1$ ./adalnctl.sh start

adalnctl.sh version 120.3.12020000.2

Checking for FNDFS executable.
Starting listener process APPS_VIS.

adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_vzsmash2b/logs/appl/admin/log/adalnctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adcmctl.sh start
cp wait parameter passed with value: N
```

```
You are running adcmctl.sh version 120.19.12020000.4


Enter the APPS username : apps

Enter the APPS password :
Starting concurrent manager for VIS ...
Starting VIS_0612@VIS Internal Concurrent Manager
Default printer is noprint

adcmctl.sh: exiting with status 0


adcmctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_vzsmash2b/logs/appl/admin/log/adcmctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adcmctl.sh abort
cp wait parameter passed with value: N


You are running adcmctl.sh version 120.19.12020000.4


Enter the APPS username : apps

Enter the APPS password :
Aborting concurrent managers for VIS ...
ORACLE Password:
Submitted request 7443009 for CONCURRENT FND ABORT


adcmctl.sh: exiting with status 0


adcmctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_vzsmash2b/logs/appl/admin/log/adcmctl.txt for more
 information ...

-bash-4.1$
-bash-4.1$ ./adalnctl.sh stop

adalnctl.sh version 120.3.12020000.2

Shutting down listener process APPS_VIS.
```

```
adalnctl.sh: exiting with status 0


adalnctl.sh: check the logfile \
/global/ebs/VIS/fs2/inst/apps/VIS_vzsmash2b/logs/appl/admin/log/adalnctl.txt for more
 information ...

You have mail in /var/mail/applvis
-bash-4.1$
```

Creating Symbolic Links

Before creating resources of type `ORCL.ebs` you must create the following symbolic links so that the Primary Applications Node can be interposed with the logical hostname (smash-6).

Note - Create symbolic links for nodes `psmash1`, `psmash2`, `vzsmash1`, `vzsmash2`, `vzsmash1b` and `vzsmash2b`.

```
root@psmash1:~# ln -s /usr/cluster/lib/libschost.so.1 /usr/lib/secure/libschost.so.1
root@psmash1:~# ln -s /usr/cluster/lib/sparcv9/libschost.so.1 /usr/lib/secure/64/
libschost.so.1
```

Saving the WebLogic and APPS User Passwords

The Oracle Solaris Cluster resources of type `ORCL.ebs` require the WebLogic Administrator and APPS user passwords. Hence, you will need to save those passwords within the Global Cluster and Zone Clusters.

```
root@psmash1:~# /usr/cluster/bin/clpstring create -b VIS -t resource VIS_APPS
Enter string value:
Enter string value again:
root@psmash1:~# /usr/cluster/bin/clpstring create -b VIS -t resource VIS_WLS
Enter string value:
Enter string value again:
root@psmash1:~#

root@vzsmash1:~# /usr/cluster/bin/clpstring create -b VIS -t resource VIS_APPS
Enter string value:
Enter string value again:
root@vzsmash1:~# /usr/cluster/bin/clpstring create -b VIS -t resource VIS_WLS
Enter string value:
Enter string value again:
```

```
root@vzsmash1:~#

root@vzsmash1b:~# /usr/cluster/bin/clpstring create -b VIS -t resource VIS_APPS
Enter string value:
Enter string value again:
root@vzsmash1b:~# /usr/cluster/bin/clpstring create -b VIS -t resource VIS_WLS
Enter string value:
Enter string value again:
root@vzsmash1b:~#
```

Registering the `ORCL.ebs` Resource Type

Register ORCL.ebs within the global cluster and zone clusters.

```
root@psmash1:~# clresourcetype register ORCL.ebs
root@psmash1:~# clresourcetype register -Z zc1 ORCL.ebs
root@psmash1:~# clresourcetype register -Z zc2 ORCL.ebs
```

Creating OPMN, OHS, TNS Listener, Node Manager and WebLogic Admin Server Resources

The Primary Applications Node (`smash-6`) can failover between the Oracle Solaris Zone Cluster nodes (`vzsmash1` and `vzsmash2`). To accomplish that, a failover resource group `ebs-fo1-rg` will be created with resources to manage the following services:

- OPMN
- Oracle HTTP Server
- TNS Listener

Note - A TNS Listener resource will be created on the Primary Applications Node (`smash-6`) which can failover between zone cluster nodes `vzsmash1` and `vzsmash2`. If `vzsmash1` and `vzsmash2` are also to be used to host other Oracle E-Business Suite 12.2.4 services, then you will need to ensure that there is no port conflict for the TNS Listener. If required, the `s_rpcport` value for the Primary Applications Node's (`smash-6`) context file can be incremented by one from 1626 to 1627.

- Node Manager
- WebLogic Admin Server

```
root@psmash1:~# zlogin zc1
[Connected to zone 'zc1' pts/3]
```

```
Oracle Corporation      SunOS 5.11      11.2    February 2015
You have new mail.
root@vzsmash1:~#
root@vzsmash1:~# clresourcegroup create ebs-fo1-rg
root@vzsmash1:~# clreslogicalhostname create -g ebs-fo1-rg \
-h smash-6 ebs-fo1-lh-rs
root@vzsmash1:~# clresource create -g ebs-fo1-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p interpose_logical_hostname=smash-6 \
-p service_group=web_entry \
-p service=opmn \
-p pmf_managed=true \
-p resource_dependencies=ebs-fo1-lh-rs \
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-fo1-opmn-rs
root@vzsmash1:~#
root@vzsmash1:~# clresource create -g ebs-fo1-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p interpose_logical_hostname=smash-6 \
-p service_group=web_entry \
-p service=ohs \
-p resource_dependencies=ebs-fo1-lh-rs,ebs-fo1-opmn-rs \
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-fo1-ohs-rs
root@vzsmash1:~#
root@vzsmash1:~# clresource create -g ebs-fo1-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p interpose_logical_hostname=smash-6 \
-p service_group=web_admin \
-p service=tns_apps \
-p resource_dependencies_offline_restart=hasp-rs \
-p resource_dependencies=ebs-fo1-lh-rs \
-p pmf_managed=true \
-d ebs-fo1-tns-rs
root@vzsmash1:~#
root@vzsmash1:~# clresource create -g ebs-fo1-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p interpose_logical_hostname=smash-6 \
-p service_group=root \
-p service=node_manager \
-p resource_dependencies_offline_restart=hasp-rs \
-p resource_dependencies=ebs-fo1-lh-rs \
-d ebs-fo1-nm-rs
root@vzsmash1:~#
```

Note - The Weblogic Admin Server resource is dependent on the database resource which, in this deployment example, is running in the global zone. However, it is not possible to set an inter-cluster dependency from a zone cluster. Instead, the command needs to be run from the global cluster to set inter-cluster dependency. Execute the following command from the global cluster.

```
root@psmash1:~# clresource create -Z zc1 -g ebs-fo1-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p interpose_logical_hostname=smash-6 \
-p service_group=web_admin \
-p service=admin_server \
-p resource_dependencies_offline_restart=hasp-rs \
-p resource_dependencies=ebs-fo1-lh-rs,ebs-fo1-tns-rs,ebs-fo1-nm-rs,global:oep-rs \
-d ebs-fo1-admin-rs
root@psmash1:~#
root@vzsmash1:~# clresourcegroup online -eM ebs-fo1-rg
root@vzsmash1:~# clresource status

=== Cluster Resources ===

Resource Name         Node Name     State       Status Message
-------------         ---------     -----       --------------
hasp-rs               vzsmash2      Online      Online
                      vzsmash1      Online      Online

ebs-fo1-admin-rs      vzsmash2      Online      Online - Service is online.
                      vzsmash1      Offline     Offline

ebs-fo1-nm-rs         vzsmash2      Online      Online - Service is online.
                      vzsmash1      Offline     Offline

ebs-fo1-tns-rs        vzsmash2      Online      Online - Service is online.
                      vzsmash1      Offline     Offline

ebs-fo1-ohs-rs        vzsmash2      Online      Online - Service is online.
                      vzsmash1      Offline     Offline

ebs-fo1-opmn-rs       vzsmash2      Online      Online - Service is online.
                      vzsmash1      Offline     Offline

ebs-fo1-lh-rs         vzsmash2      Online      Online - LogicalHostname online.
                      vzsmash1      Offline     Offline

root@vzsmash1:~#
```

Test a switch over to `vzsmash1` of `ebs-fo1-rg`. From another terminal on either `vzsmash1` or `vzsmash2`, you can issue the `clresource status` command to see the resources stopping and starting.

```
root@vzsmash1:~# clresourcegroup switch -n vzsmash1 ebs-fo1-rg
root@vzsmash1:~# clresource status

=== Cluster Resources ===

Resource Name         Node Name     State       Status Message
-------------         ---------     -----       --------------
hasp-rs               vzsmash2      Online      Online
                      vzsmash1      Online      Online

ebs-fo1-admin-rs      vzsmash2      Offline     Offline
                      vzsmash1      Online      Online - Service is online.

ebs-fo1-nm-rs         vzsmash2      Offline     Offline
                      vzsmash1      Online      Online - Service is online.

ebs-fo1-tns-rs        vzsmash2      Offline     Offline
                      vzsmash1      Online      Online - Service is online.

ebs-fo1-ohs-rs        vzsmash2      Offline     Offline
                      vzsmash1      Online      Online - Service is online.

ebs-fo1-opmn-rs       vzsmash2      Offline     Offline
                      vzsmash1      Online      Online - Service is online.

ebs-fo1-lh-rs         vzsmash2      Offline     Offline - LogicalHostname offline.
                      vzsmash1      Online      Online - LogicalHostname online.

root@vzsmash1:~#
```

Creating TNS Listener, Node Manager, `oacore`, `oafm`, `forms` and `forms-c4ws` Resources

Create a multi-master resource group on the Global Cluster nodes (`psmash1` and `psmash2`) for the following resources:

- TNS Listener
- Node Manager
- Web Applications oacore
- Web Applications oafm

- Web Applications forms
- Web Applications forms-c4ws

Note - Issue the following Oracle Solaris Cluster commands on just one node.

```
root@psmash1:~# clresourcegroup create -S ebs-mm-rg
root@psmash1:~#
root@psmash1:~# clresource create -g ebs-mm-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p service_group=web_applications \
-p service=tns_apps \
-p resource_dependencies_offline_restart=hasp-rs \
-p pmf_managed=true \
-d ebs-mm-tns-rs
root@psmash1:~#
root@psmash1:~# clresource create -g ebs-mm-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS -p service_group=root \
-p service=node_manager \
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-mm-nm-rs
root@psmash1:~#
root@psmash1:~# clresource create -g ebs-mm-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p service_group=web_applications \
-p service=oacore \
-p resource_dependencies=ebs-mm-tns-rs,ebs-mm-nm-rs,oep-rs \
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-mm-oacore-rs
root@psmash1:~#
root@psmash1:~# clresource create -g ebs-mm-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p service_group=web_applications \
-p service=oafm \
-p resource_dependencies=ebs-mm-tns-rs,ebs-mm-nm-rs,oep-rs \
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-mm-oafm-rs
root@psmash1:~#
root@psmash1:~# clresource create -g ebs-mm-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p service_group=web_applications \
-p service=forms \
-p resource_dependencies=ebs-mm-tns-rs,ebs-mm-nm-rs,oep-rs \
```

```
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-mm-forms-rs
root@psmash1:~#
root@psmash1:~# clresource create -g ebs-mm-rg \
-t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p service_group=web_applications \
-p service=forms-c4ws \
-p resource_dependencies=ebs-mm-tns-rs,ebs-mm-nm-rs,oep-rs \
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-mm-forms-c4ws-rs
root@psmash1:~#
root@psmash1:~# clresourcegroup online -eM ebs-mm-rg
root@psmash1:~# clresource status -g ebs-mm-rg

=== Cluster Resources ===

Resource Name            Node Name    State     Status Message
-------------            ---------    -----     --------------
ebs-mm-forms-c4ws-rs     psmash2      Online    Online - Service is online.
                         psmash1      Online    Online - Service is online.

ebs-mm-forms-rs          psmash2      Online    Online - Service is online.
                         psmash1      Online    Online - Service is online.

ebs-mm-oafm-rs           psmash2      Online    Online - Service is online.
                         psmash1      Online    Online - Service is online.

ebs-mm-oacore-rs         psmash2      Online    Online - Service is online.
                         psmash1      Online    Online - Service is online.

ebs-mm-nm-rs             psmash2      Online    Online - Service is online.
                         psmash1      Online    Online - Service is online.

ebs-mm-tns-rs            psmash2      Online    Online - Service is online.
                         psmash1      Online    Online - Service is online.

root@psmash1:~#
```

Creating TNS Listener and Concurrent Manager Resources

Note - Parallel Concurrent Processing (PCP) has already been configured.

Create a multi-master resource group within the zone cluster `zc2` (`vzsmash1b` and `vzsmash2b`) for the following resources:

- TNS Listener
- Concurrent Manager

```
root@vzsmash1b:~# clresourcegroup create -S ebs-mm-rg
root@vzsmash1b:~# clresource create -g ebs-mm-rg -t ORCL.ebs \
-p base_dir=/global/ebs/VIS \
-p service_group=batch \
-p service=tns_apps \
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-mm-tns-rs
root@vzsmash1b:~#
```

Note - The Concurrent Manager resource is dependent on the database resource which, in this deployment example, is running in the global zone. However, it is not possible to set an inter-cluster dependency from a zone cluster. Instead, the command needs to be run from the global cluster to set inter-cluster dependency. Execute the following command from the global cluster.

```
root@psmash1:~# clresource create -Z zc2 -g ebs-mm-rg -t ORCL.ebs \
-p base_dir=/global/ebs/VIS -p service_group=batch -p service=concmgr \
-p resource_dependencies=ebs-mm-tns-rs,global:oep-rs \
-p resource_dependencies_offline_restart=hasp-rs \
-d ebs-mm-concmgr-rs
root@psmash1:~#
root@vzsmash1b:~# clresourcegroup online -eM ebs-mm-rg
root@vzsmash1b:~# clresource status

=== Cluster Resources ===

Resource Name          Node Name     State      Status Message
-------------          ---------     -----      --------------
hasp-rs                vzsmash2b     Online     Online
                       vzsmash1b     Online     Online

ebs-mm-concmgr-rs      vzsmash2b     Online     Online - Service is online.
                       vzsmash1b     Online     Online - Service is online.

ebs-mm-tns-rs          vzsmash2b     Online     Online - Service is online.
                       vzsmash1b     Online     Online - Service is online.

root@vzsmash1b:~#
```

HA for Oracle E-Business Suite 12.2 or Later Extension Properties

The ORCL.ebs resource type inherits the algorithms and properties from the `ORCL.gds` resource type. Only the additional extension properties for the ORCL.ebs resource type are described in this Appendix. For a description of all other properties, see *Administering an Oracle Solaris Cluster 4.4 Configuration*.

`ORCL.ebs` Extension Properties

The additional extension properties of this resource type are as follows:

`Base_dir`

This property interposes the Oracle E-Business Suite 12.2 or later base directory.

Data type String

Default None defined

Per node False

Tunable When disabled

`Service`

This property identifies the Oracle E-Business Suite 12.2 or later suite service.

Data type string

Default None defined

Per node True

Tunable When disabled

`Service_group`

This property identifies the Oracle E-Business Suite 12.2 or later service group.

Data type String

Default None defined

Per node True

Tunable When disabled

`Status_message`

This property turns on and off the descriptive status messages.

Data type Boolean

Default False

Per node False

Tunable Anytime

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