Oracle® Hyperion Enterprise Performance Management System

High Availability and Disaster Recovery Guide

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ORACLE®

**ENTERPRISE PERFORMANCE
MANAGEMENT SYSTEM**

Contents

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About High Availability and Disaster Recovery

Assumed Knowledge

This guide is for administrators who install, configure, deploy, and manage Oracle Hyperion Enterprise Performance Management System products. It assumes the following:

- Security and server administration skills

- Windows or UNIX administration skills or both, depending on your computing environment

- Web application server administration skills, including familiarity with WebLogic

- A strong understanding of your organization's security infrastructure, including authentication providers such as Microsoft Active Directory, Lightweight Directory Access Protocol (LDAP) Enabled providers, Oracle Internet Directory, and mSunONE LDAP Directory, and use of Secure Sockets Layer (SSL)

- A strong understanding of your organization's database and server environments, including file systems

- A strong understanding of your organization's network environment and port usage

Installation Documentation Roadmap

You can find EPM System installation documentation in the Oracle Documentation Library (http://www.oracle.com/technology/documentation/epm.html) on Oracle® Technology Network. For faster access to the documentation for a specific release, you can use the Enterprise Performance Management Documentation Portal (http://www.oracle.com/us/solutions/ent-performance-bi/technical-information-147174.html), which also contains links to EPM Supported Platform Matrices, My Oracle Support, and other information resources.

Note: Always check the Oracle Documentation Library (http://www.oracle.com/technology/documentation/epm.html) on Oracle® Technology Network to see whether an updated version of a guide is available.

Table 1 lists the documents to consult for instructions on performing essential installation tasks.

Table 1   Documentation That You Need

Task	Related Documentation
Meeting system requirements and understanding release compatibility	*Oracle Hyperion Enterprise Performance Management System Certification Matrix* (http://www.oracle.com/technology/software/products/ias/files/fusion_certification.html)
Planning the installation	*Oracle Hyperion Enterprise Performance Management System Installation Start Here*
• Installing, configuring, and deploying EPM System products • Starting EPM System products • Validating the installation • Upgrading EPM System products	*Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*
Securing EPM System	*Hyperion Security Administration Guide*
Provisioning users	*Oracle Hyperion Enterprise Performance Management System User and Role Security Guide*

Table 2 lists the documents to consult for additional installation tasks that you might need to perform.

Table 2   Documentation That You Might Need

Task	Related Documentation
Troubleshooting installations	*Oracle Hyperion Enterprise Performance Management System Installation and Configuration Troubleshooting Guide*
Creating a backup of product and application data	*Oracle Hyperion Enterprise Performance Management System Backup and Recovery Guide*
Migrating from one environment to another	*Oracle Hyperion Enterprise Performance Management System Lifecycle Management Guide*
Clustering EPM System applications for high availability and disaster recovery	*Oracle Hyperion Enterprise Performance Management System High Availability and Disaster Recovery Guide*

Additional content is available in the White Papers Library at Oracle Enterprise Performance Management / Business Intelligence White papers. (http://www.oracle.com/technetwork/middleware/bi-foundation/resource-library-090986.html).

High Availability and Disaster Recovery Comparison

High Availability and Disaster Recovery (sometimes also known as business continuity) address different requirements, as shown in Table 3.

Table 3   High Availability and Disaster Recovery Compared

High Availability	Disaster Recovery
Addresses service availability, providing redundancy so that if one infrastructure component (network, servers, processes) becomes unavailable, overall service remains available.	Addresses service continuity, so that in case of disaster, service is maintained through a standby site.
A single system contains its own data (in the file system and database) and executables.	Two independent environments, typically in separate and distinct facilities, each contain their own data (in the file system and database) and executables.
Data replication is unnecessary (although data should be backed up).	Data and configuration information are replicated between the production and standby sites.

For information on setting up Disaster Recovery for EPM System components, see Chapter 3, "Disaster Recovery." For general information on setting up Disaster Recovery, see the *Oracle Fusion Middleware Disaster Recovery Guide* (http://download.oracle.com/docs/cd/E14571_01/ doc.1111/e15250/toc.htm).

High Availability and Load Balancing for EPM System Components

Most EPM System components support clustering in active-active configurations to remove single points of failure from the architecture, maintain consistent performance through load balancing, or both. Components that support clustering include Web applications, Oracle Essbase Server, and Oracle Hyperion Financial Management, Fusion Edition, server, which are clustered with Oracle's Hyperion Enterprise Performance Management System Configurator.

Note: You can cluster Essbase Server in an active-passive configuration with EPM System Configurator. To cluster Essbase Server in an active-active configuration, you use Oracle Hyperion Provider Services. See Chapter 5, "Essbase Server Clustering and Failover."

Other components can be clustered outside EPM System Configurator.

Components Clustered with EPM System Configurator

The following EPM System components can be clustered with EPM System Configurator:

● Oracle's Hyperion® Foundation Services

- Foundation Services Managed Server (including Oracle's Hyperion® Shared Services, Oracle Enterprise Performance Management Workspace, Fusion Edition, and Foundation Web Service)
    - Oracle Hyperion EPM Architect, Fusion Edition
    - Performance Management Architect Data Synchronization
    - Hyperion Calculation Manager
- Essbase
    - Essbase Server (active-passive configuration)
    - Oracle Essbase Administration Services
    - Provider Services
- Oracle's Hyperion Reporting and Analysis
    - Oracle's Hyperion Reporting and Analysis Framework
    - Oracle Hyperion Financial Reporting, Fusion Edition
    - Oracle's Hyperion® Web Analysis
- Oracle's Hyperion® Financial Performance Management Applications
    - Oracle Hyperion Planning, Fusion Edition
    - Financial Management
        - Financial Management Server
        - Financial Management Web application
        - Financial Management Web Services Web Application (IIS)
        - Financial Management LCM Web Services Web Application (IIS)
        - Financial Management Oracle Hyperion Smart View for Office, Fusion Edition, Web Services Web Application (IIS)
        - Financial Management Web Application (IIS)
    - Oracle Hyperion Profitability and Cost Management, Fusion Edition
    - Oracle Hyperion Performance Scorecard, Fusion Edition
    - Oracle Hyperion Financial Close Management
    - Oracle Hyperion Disclosure Management
- Data Management
    - Oracle Hyperion Financial Data Quality Management, Fusion Edition, Web Application (IIS)
    - Oracle Hyperion Financial Data Quality Management ERP Integration Adapter for Oracle Applications
    - ERP Integrator Web Application

See Chapter 2, "Support Matrix for High Availability and Load Balancing" and Chapter 8, "Clustering EPM System Web Applications."

Components Clustered Outside EPM System Configurator

The following EPM System components support clustering outside EPM System Configurator for removing single points of failure from the architecture, maintaining consistent performance through load balancing, or both.

- Foundation
  - Performance Management Architect Dimension Server

    See Chapter 4, "Foundation Services Clustering."

- Essbase Server (active-active cluster configuration)

  See Chapter 5, "Essbase Server Clustering and Failover."

- Reporting and Analysis
  - Reporting and Analysis Framework Services and Common Libraries

    See "Clustering Reporting and Analysis Framework Services and Common Libraries" on page 46.

  - Oracle's Hyperion® Interactive Reporting

    See "Clustering Interactive Reporting Services" on page 47.

  - Financial Reporting Print Server

    See "Financial Reporting Print Server Clusters" on page 47.

- Data Management:
  - FDM Application Server

    See "FDM Clusters" on page 49.

  - Oracle Hyperion Data Relationship Management, Fusion Edition, Web Application (IIS)

    See "Data Relationship Management Clusters" on page 50.

  - Data Relationship Management Application Server

    See "Data Relationship Management Clusters" on page 50.

See Chapter 2, "Support Matrix for High Availability and Load Balancing."

General Clustering Considerations

Note these general points when installing EPM System components in a distributed environment:

- If you have more than one Oracle HTTP Server or IIS Web server, you must use a load balancer (hardware or software) to route traffic to the servers, and the logical Web address for the Web application cluster should be the load balancer. If you have only one Oracle HTTP Server or IIS Web server, the logical Web address for the Web application cluster should be the Oracle HTTP Server or IIS.

- Foundation Services is required on only one machine in the deployment, unless multiple instances are required for clustering.

- There is a required configuration sequence for EPM System components installed in a distributed environment. In particular, you must configure Foundation Services first. See "Configuration Sequence in a Distributed Environment" in Chapter 4, "Configuring EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*.

- In a distributed environment, EPM Oracle home must be the samè on all machines.

- When configuring EPM System for high availability where multiple instances of services are running, you must point to the same location on a shared disk in these fields in EPM System Configurator:

  o (Reporting and Analysis Framework Services) Repository Directory

  o (Essbase Server) File path to application location (ARBORPATH)

  o Performance Scorecard - Configure Attachment Files Location

  Example:

  o Repository Directory—`s:/pkt7119/user_projects/epmsystem1/ReportingAnalysis/data/RM1`

  o Full path to application location (ARBORPATH)—`s:/pkt7119/user_projects/epmsystem1/EssbaseServer/essbaseserver1`

  o Performance Scorecard - Configure Attachment Files Location—`s:/pkt7119/user_projects/epmsystem1/HPS/hpsfiles`

- On the machine on which you plan to administer the WebLogic Server, you must install all Web applications that you plan to deploy on any machine in the environment. (The WebLogic Administration Server is installed and deployed on the Foundation Services machine.)

- On each remote machine in a distributed environment, install the Web applications that you plan to run on that machine and then use EPM System Configurator to deploy the Web applications automatically, or manually deploy the Web applications.

  Note: Oracle Hyperion Enterprise Performance Management System Installer, Fusion Edition installs WebLogic Server on each machine (for Web tier and Service tier components) in a distributed environment.

- If you are deploying Web applications on a machine other than the WebLogic Administration Server machine, WebLogic Administration Server must be running.

- All Web applications in an EPM System deployment must be deployed on either all Windows machines or on all UNIX machines. However, because Financial Management runs only on Windows, if you are using Financial Reporting with Financial Management, you must install them together on a Windows machine. (Financial Management is not supported as a data source on a UNIX platform.) If your other Web applications are deployed to UNIX machines, deploy Financial Reporting and Web Analysis on Windows using a manual process. See "Deploying Financial Reporting and Web Analysis on Windows for use with

Financial Management" in Chapter 6, "Manually Deploying EPM System Web Applications," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide.*

- You can have more than one Web server in a deployment for load balancing and failover. In this scenario, configure the Web server on each machine in the environment.

- For IIS 6.0, you cannot install 32-bit components on a 64-bit system on which 64-bit components are installed. On 32-bit platforms, all EPM System products can coexist. For IIS 7 (the default on Windows 2008 systems), 32-bit and 64-bit components can coexist.

- EPM System static content, including product online help, is installed with Oracle HTTP Server.

- If you are using FDM and IIS as the Web server, you must install the FDM Web application and the Web server on the same box.

- If you are using Financial Management and IIS as the Web server, you must install Financial Management Web applications and the Web server on the same box.

See "Installing EPM System Products in a Distributed Environment" in Chapter 3, "Installing EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide.*

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Support Matrix for High Availability and Load Balancing

The tables in this chapter list the supported clustering methodologies for EPM System components by product group and indicate whether high availability and load balancing are supported for each component. The tables also include notes and references to additional information.

Table 4 Foundation Services Clustering

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes	References
Foundation Services Managed Server (including Shared Services, EPM Workspace, and Foundation Web Services Web applications)	WebLogic clustering with EPM System Configurator	Yes	Yes	To configure Oracle Hyperion Enterprise Performance Management System Lifecycle Management for high availability when Shared Services is set up for high availability, you must set up a shared disk.	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● "Configuring Lifecycle Management for Shared Services High Availability" in Chapter 4, "Foundation Services Clustering," of this guide ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Performance Management Architect Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Performance Management Architect Data Synchronizer Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide

Product/Component	Supported Methodology	High Availability	Load Balancing	Notes	References
Calculation Manager Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Performance Management Architect Dimension Server and other processes	Oracle Clusterware clustering for failover	Yes	No	None	● Chapter 4, "Foundation Services Clustering" in this guide ● Oracle Clusterware documentation

Table 5   Essbase Clustering

Product/Component	Supported Methodology	High Availability	Load Balancing	Notes	References
Essbase Server	● Active-passive clustering with EPM System Configurator ● Active-active clustering with Provider Services	Yes	Active-active clusters configured with Provider Services support load-balancing.	● Active-passive clusters support failover with write-back. ● Active-active clusters are read-only.	● Active-passive clustering: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Active-active clustering: Chapter 5, "Essbase Server Clustering and Failover," in this guide
Administration Services Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	Session failover is not supported.	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Provider Services Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes	References
Oracle Essbase Integration Services	None	No	No	None	None
Oracle Essbase Studio	None	No	No	None	None

Table 6   Reporting and Analysis Clustering

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes	References
Reporting and Analysis Framework Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Financial Reporting Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Web Analysis Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Reporting and Analysis Framework Services and Common Libraries	Virtual clustering through EPM Workspace	Yes	Yes	None	Chapter 6, "Reporting and Analysis Services Clustering," in this guide
Interactive Reporting Services	Virtual clustering through EPM Workspace	Yes	Yes	None	Chapter 6, "Reporting and Analysis Services Clustering," in this guide
Financial Reporting Print Server	Installation on different machines for physical clustering	Yes	Yes	None	Chapter 6, "Reporting and Analysis Services Clustering," in this guide

Table 7 Financial Performance Management Applications Clustering

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes	References
Planning Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	• Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* • Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Planning RMI Registry	None	No	No	None	None
Financial Management Server	Clustering with EPM System Configurator	Yes	Yes	In EPM System Configurator, use the Register Application Servers/ Clusters task.	"Clustering Financial Management Servers" in Chapter 4, "Configuring EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*
Financial Management Web Services Web Application	WebLogic clustering with EPM System Configurator	Yes	Yes	None	• Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* • Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Financial Management Web Services Web Application (IIS)	Clustering with Oracle HTTP Server or third-party load balancers	Yes	Yes	None	"Load Balancing Financial Management or FDM Web Applications on IIS" in Chapter 4, "Configuring EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*
Financial Management Web Application (IIS)	Clustering with Oracle HTTP Server or third-party load balancers	Yes	Yes	None	"Load Balancing Financial Management or FDM Web Applications on IIS" in Chapter 4, "Configuring EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*
Financial Management Lifecycle Management Web Services Web Application (IIS)	Clustering with Oracle HTTP Server or third-party load balancers	Yes	Yes	None	"Load Balancing Financial Management or FDM Web Applications on IIS" in Chapter 4, "Configuring EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes	References
Financial Management Smart View Web Services (IIS)	Clustering with Oracle HTTP Server or third-party load balancers	Yes	Yes	None	"Load Balancing Financial Management or FDM Web Applications on IIS" in Chapter 4, "Configuring EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*
Performance Scorecard	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Profitability and Cost Management	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Disclosure Management	None	No	No	None	None
Financial Close Management	WebLogic clustering with EPM System Configurator	Yes	Yes	None	● Automatic deployment: Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* ● Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide ● Load balancing: "Configuring High Availability for Oracle Fusion Middleware SOA Suite" in the *Oracle Fusion Middleware High Availability Guide*

Table 8   Data Management Products Clustering

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes	References
FDM Application Server	Clustering with the FDM proprietary load balancer	Yes	Yes	None	● Database software documentation ● "FDM Clusters" on page 49 ● *Oracle Hyperion Financial Data Quality Management, Fusion Edition, Configuration Guide*

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes	References
FDM proprietary load balancer	None	Yes	No	The load balancer is designed to be installed in more than one place in an environment. If the primary load balancer becomes unavailable, clients use a secondary load balancer.	None
FDM IIS Web Application	Clustering with Oracle HTTP Server or third-party load balancers	Yes	Yes	None	"Load Balancing Financial Management or FDM Web Applications on IIS" in Chapter 4, "Configuring EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*
FDM Task Manager	None	No	No	None	None
ERP Integrator	WebLogic clustering with EPM System Configurator	Yes	Yes	None	- Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide* - Manual deployment: Chapter 8, "Clustering EPM System Web Applications," in this guide
Data Relationship Management IIS Web Application	Clustering with Oracle HTTP Server or third-party load balancers	No	Yes	Multiple Microsoft IIS instances are deployed in an active-active configuration.	"Data Relationship Management Clusters" on page 50 "Configuring Load Balancing for Data Relationship Management Web Applications" in the *Oracle Hyperion Data Relationship Management Installation Guide*
Data Relationship Management Application Server	Clustering with Data Relationship Management proprietary load balancing	No	Yes	Multiple application servers are deployed in a primary-secondary configuration.	"Data Relationship Management Clusters" on page 50 "Configuring Host Machines" in the *Oracle Hyperion Data Relationship Management Installation Guide*

3

Disaster Recovery

General Information About Disaster Recovery

This chapter contains information that is specific to EPM System Disaster Recovery configurations. The *Oracle Fusion Middleware Disaster Recovery Guide* (http://download.oracle.com/docs/cd/E14571_01/doc.1111/e15250/toc.htm) is the primary reference for design considerations, recommendations, setup procedures, troubleshooting steps, and other information that you need to deploy and manage the Oracle Fusion Middleware Disaster Recovery solution.

Disaster Recovery Architecture

Figure 1   EPM System Disaster Recovery Architecture
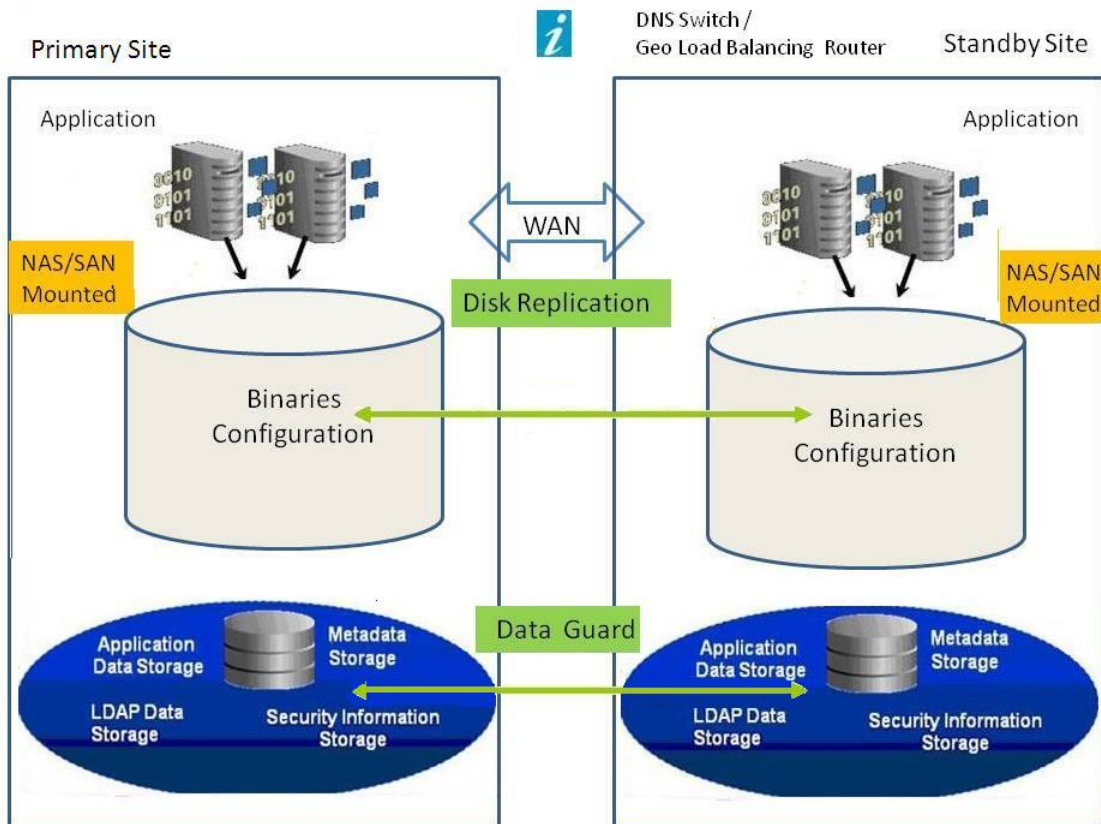
Note: Although the deployment shown in Figure 1 uses symmetric topology, with the same number of servers at the production and standby sites, deployment using asymmetric topology (with fewer servers at the standby site than at the production site) is also possible. Deployment with asymmetric topology requires a server at the standby site for each logical server cluster at the production site.

Use of a shared or replicated disk requires a common share across machines; for example, the share can be under `/user_projects/data`.

Disaster Recovery for EPM System Components

Subtopics

- Environment Configuration
- Host Name Requirements
- Database Recommendations

Environment Configuration

Configuring a Disaster-Recovery environment requires these steps:

1. Install and configure EPM System at the production site.

   Runtime executables and data should be on a replicatable partition

   Distributed services must be clustered to form a logical service.

2. If the host names at the standby site differ from the host names at the production site, set up host name aliases at the standby site. See "Host Name Requirements" on page 23.

3. When the EPM System configuration at the production site is complete, install and configure EPM System at the standby site.

4. Set up database replication.

   Note: You can use a backup and restoration procedure for replication.

5. Enable the standby site.

   - Disable mirroring between the production and standby sites.

   - Run the crash-recovery procedure for each application to recover Essbase. See Chapter 4, Essbase Components, in the *Oracle Hyperion Enterprise Performance Management System Backup and Recovery Guide*.

   - Start the services on the standby hosts.

Host Name Requirements

An EPM System Disaster Recovery deployment requires a means of resolving host references between the production and standby sites. Ensure that your configuration uses one of these options, listed in order of preference:

- Production and standby sites are on separate networks.

   The fully qualified host names can be the same in both sites.

- Production and standby sites have different DNS that resolve the host names to the correct IP address in their network.

   The standby site can have a standby DNS that is activated when a disaster occurs.

- Production host names are resolved to a local IP address at the standby site by means of an `/etc/hosts` file.

If the host names must differ between the production and standby sites and there is no separate DNS for the standby site, set up an alias for the production site servers in the standby site as shown in Figure 2, so that the main server is the first entry in the alias.

Figure 2   Host Name Alias Setup
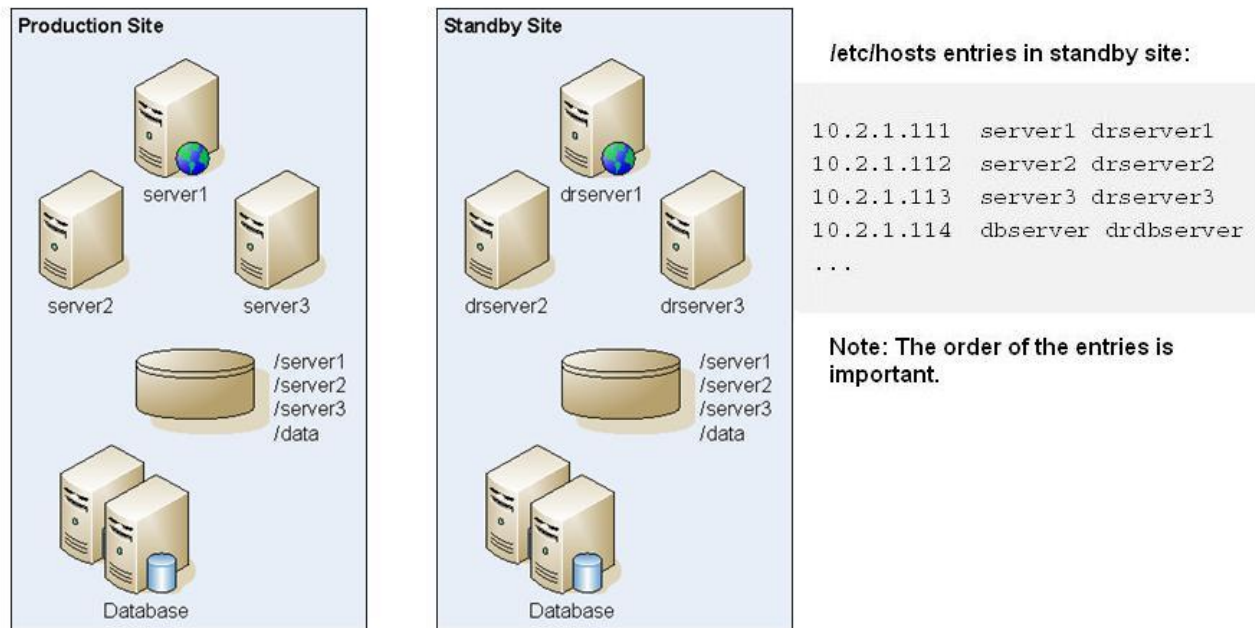
Database Recommendations

Database recommendations for a Disaster Recovery environment:

- Use the database host name alias on the standby site.
- Use Oracle Data Guard configuration for data repositories.
- For planned configuration changes, force database synchronization with Oracle Data Guard.

See the Oracle Data Guard documentation at http://www.oracle.com/technology/deploy/availability/htdocs/DataGuardOverview.html.

Disaster Recovery Without File System and Database Replication

You can set up Disaster Recovery using backup instead of file system and database replication. With replication, any changes made on the production site are also applied to the standby site. Backup is less costly than replication but enables you to recover only backed-up data. For example, if data was last backed up on Friday and the production site is damaged on the following

Thursday, data changes that occurred between the two dates are lost. More-frequent backups enable you to recover more data.

The file system backup and the database backup must be synchronized. Backing up the file system and the database at approximately the same time, when there is relatively little activity, ensures that they are synchronized.

For Disaster Recovery without file systems and database replication, take one of these steps:

- Replicate the installation image to ensure that all patches applied to the production site after the initial setup are also applied to the standby site.

- Promptly manually apply all patches at the production site to the standby site.

Additional Information

For more information about setting up a Disaster Recovery environment, see these documents:

- The *Oracle Fusion Middleware Disaster Recovery Guide* (http://download.oracle.com/docs/cd/E14571_01/doc.1111/e15250/intro.htm#BABHCEJJ)

- The Oracle Data Guard documentation at http://www.oracle.com/technology/deploy/availability/htdocs/DataGuardOverview.html

- *Oracle Fusion Middleware DR Solution Using NetApp Storage* at http://www.netapp.com/us/library/technical-reports/tr-3672.html

- The Disaster Recovery guide for the RDBMS that you use.

4

Foundation Services Clustering

This chapter provides information about configuring Lifecycle Management for Shared Services high availability and setting up Performance Management Architect Dimension Server for failover. For information about clustering Foundation Services Web applications through EPM System Configurator, see Chapter 8, "Clustering EPM System Web Applications."

Configuring Lifecycle Management for Shared Services High Availability

This section describes how to configure Lifecycle Management when Shared Services is set up for high availability and is started as a Windows service.

After this configuration is completed, when artifacts are exported using Lifecycle Management, the content is exported to a path on a shared disk; when imported, the content is read from the shared disk exported location.

➤ To configure Lifecycle Management for high availability:

1 Set up a shared disk/folder that is accessible to all Shared Services nodes.

2 On each node, start Shared Services as a service using the login of a domain user who has access to the shared disk/folder.

3 On one node, launch Oracle's Hyperion® Shared Services Console and expand the **Deployment Metadata** node under the **Foundation** application group.

4 Expand the **Shared Services Registry** node, then **Foundation Services**, and then **Shared Services**.

5 Under the **Shared Services** node, right-click the **Properties** node and select **Export for Edit**.

6 Save the `component.properties` file to a location on the file system.

7 Open the saved file in a text editor and search for the property `filesystem.artifact.path`.

8 Change the value associated with the `filesystem.artifact.path` property.

UNIX-style UNC paths with forward slashes must be defined for the shared disk; for example:

```
filesystem.artifact.path=//hostname/share
```

9   Save the changes.

10   From Oracle's Hyperion® Shared Services Console, right-click the **Properties** node under **Shared
     Services**, and select **Import after Edit**.

11   Browse to the location of the updated file and select the file.

     This action updates the property in Oracle's Hyperion Shared Services Registry.

12   Restart Shared Services on this node and all other nodes using the domain user login.

Performance Management Architect Dimension Server Clustering and Failover

Subtopics

- Task Sequence
- VIP Resources
- Action Scripts
- Application Resources
- Setting the Performance Management Architect Server Logical Web Address

Task Sequence

You use Oracle Clusterware to cluster Performance Management Architect Dimension Server
for failover in an active-passive configuration. Oracle Clusterware documentation is available
at http://www.oracle.com/pls/db112/portal.portal_db?
selected=16&frame=#oracle_clusterware.

For information about clustering Web Application and Performance Management Architect
Data Synchronizer Web Application, see Chapter 8, "Clustering EPM System Web
Applications."

Clustering Performance Management Architect Dimension Server for failover involves this task
sequence:

1.   Installing the Performance Management Architect Dimension Server component in the
     Oracle Clusterware shared folder on a clustered disk, or in a subfolder of that folder.

2.   Configuring Performance Management Architect with EPM System Configurator

     See Chapter 4, "Configuring EPM System Products", in the *Oracle Hyperion Enterprise
     Performance Management System Installation and Configuration Guide*.

3.   Creating and registering a virtual Internet protocol (VIP) resource with Oracle Clusterware

     See "VIP Resources" on page 29.

4.   Creating an action script

     See "Action Scripts" on page 30.

5. Creating and registering an application resource with Oracle Clusterware

   See .

6. Setting the Performance Management Architect Dimension Server logical Web address

   See .

VIP Resources

Subtopics

- Editing `EPMA_CreateAndStartVIPResource.bat`
- Stopping and Unregistering VIP Resources
- Checking VIP Resource Status

You run `EPMA_CreateAndStartVIPResource.bat`, in *EPM_ORACLE_HOME*`/products/ Foundation/BPMA/AppServer/DimensionServer/ServerEngine/Failover`, to create, register, and start a VIP resource. The VIP resource is paired with an application resource to provide a single point of access. The batch file runs in a command window and pauses when finished. Pressing any key closes the command window.

Before running `EPMA_CreateAndStartVIPResource.bat`, you can edit it to conform with your environment. You use a different batch file to stop and delete the VIP resource after deleting the application resource.

If clients access the application through a network, and failover to another node is enabled, you must register a VIP address for the application. Oracle Clusterware provides a standard VIP agent for application VIPs. Basing any new application VIPs on the VIP type that is referenced in `EPMA_CreateAndStartVIPResource.bat` ensures consistent behavior among all VIPs deployed in a cluster.

Editing `EPMA_CreateAndStartVIPResource.bat`

You can edit `EPMA_CreateAndStartVIPResource.bat` to specify values for these variables, which are listed at the top of the script:

- `ACTION_SCRIPT`—Full path and file name for `usrvip.bat`, which is in the Oracle Clusterware installation folder

  This batch file is the action script that Oracle Clusterware uses to manage the VIP resource.

- `VIP_IP`—A cluster VIP, registered in DNS

- `START_TIMEOUT`—Number of seconds that Oracle Clusterware waits for the VIP resource to start before declaring a failed start

- `STOP_TIMEOUT`—Number of seconds that Oracle Clusterware waits for the VIP resource to stop before declaring a failed stop

- `CHECK_INTERVAL`—Number of seconds between repeated checks

Shortening intervals for more-frequent checks increases resource consumption if you use the script agent. To reduce resource consumption, use an application-specific agent.

- `SCRIPT_TIMEOUT`–Maximum time in seconds for an action to run

  Oracle Clusterware returns an error message if the action script does not finish within the specified time. The timeout applies to all actions (start, stop, check, and clean).

- `RESTART_ATTEMPTS`–Number of times Oracle Clusterware attempts to restart a resource on the resource's current server before attempting to relocate it

  For example, if the value is 1, Oracle Clusterware attempts to relocate the resource after a second failure. A value of 0 indicates that there is no attempt to restart, but Oracle Clusterware always attempts to fail the resource over to another server.

- `CRS_HOME`–Full path to the `BIN` folder for your Oracle Clusterware installation

Stopping and Unregistering VIP Resources

After you unregister an application resource, you can stop and delete the associated VIP resource, which unregisters the resource. Deleting a VIP resource does not affect the Performance Management Architect installation.

➤ To stop and unregister a VIP resource, run `EPMA_StopAndDeleteVIPResource.bat`, in *EPM_ORACLE_HOME*`/products/Foundation/BPMA/AppServer/DimensionServer/ServerEngine/Failover`. The batch file runs in a command window and pauses when finished. Pressing any key closes the command window.

Checking VIP Resource Status

After running `EPMA_CreateAndStartVIPResource.bat` or `EPMA_StopAndDeleteVIPResource.bat`, you can run this command from the command line to check the status of the VIP resource:

`crsctl status resource epmavip -v`

A status of `STATE=ONLINE` indicates that the resource is running correctly. After you run `EPMA_StopAndDeleteVIPResource.bat`, the VIP resource should no longer exist.

Action Scripts

Oracle Clusterware calls an action script to stop or start an application resource (for example, Performance Management Architect Dimension Server) or to check the status of the application. You can run the action script from Oracle Clusterware or from the command line. The action script logs the date, time, action being performed (start, stop, clean, or check), and action result (success or failure).

You create the action script by editing `EPMA_ActionScript.bat`, in *EPM_ORACLE_HOME*`/products/Foundation/BPMA/AppServer/DimensionServer/ServerEngine/Failover`, to conform to your environment.

You can edit `EPMA_ActionScript.bat` to specify these variables, which are listed at the top of the script:

- `LOG_PATH`–Full path to a local folder where the application resource action script logs information

  Example: `set LOG_PATH=C:/CRS_ACTION/EPMA`

  Assuming that you provide a path with a valid drive letter, the action script creates the path at runtime if the path does not exist.

- `LOGSCR`–A concatenation of the `LOG_PATH` value and a valid file name for the environment

  Example: `set LOGSCR=%LOG_PATH%/ClusterActionEPMA.log`

- `SECONDS_TO_WAIT_FOR_START`–Number of seconds that the action script waits for the application resource to start before declaring a failed start and returning a 0 to the calling process (Oracle Clusterware)

  Example: `set SECONDS_TO_WAIT_FOR_START=180`

- `SECONDS_TO_WAIT_FOR_STOP`–Number of seconds that the action script waits for the application resource to stop before declaring a failed stop and returning a 0 to the calling process (Oracle Clusterware)

  Example: `set SECONDS_TO_WAIT_FOR_STOP=60`

Note: If your Performance Management Architect release is 11.1.2.1, the two sections labeled `EPMA pre-11.1.2.1 section` should be commented out.

If your Performance Management Architect release is 11.1.2.0 or earlier, the section labeled `EPMA 11.1.2.1 section` should be commented out.

Application Resources

Subtopics

- Editing `EPMA_CreateAndStartAppResource.bat`
- Stopping and Unregistering Application Resources
- Checking Application Resource Status

You run `EPMA_CreateAndStartAppResource.bat`, in *EPM_ORACLE_HOME*`/products/Foundation/BPMA/AppServer/DimensionServer/ServerEngine/Failover`, to create, register, and start an application resource. The VIP resource is paired with a VIP resource to provide a single point of access.

Before running `EPMA_CreateAndStartAppResource.bat`, you can edit it to conform with your environment. You use a different batch file to stop and delete the application resource.

If you stop the application resource by running `crsctl stop resource EPMAServer -f` or by shutting down the Hyperion EPMA Server service directly using the Windows Services applet, Oracle Clusterware automatically attempts to restart it on another node in the cluster. For the application resource to stay idle, you must run `EPMA_StopAndDeleteAppResource.bat`. To

restart an application resource after deleting it with
`EPMA_StopAndDeleteAppResource.bat`, you must run
`EPMA_CreateAndStartAppResource.bat` to recreate and start it. Deleting the VIP and application resources has no effect on the Performance Management Architect installation.

Caution! After running `EPMA_CreateAndStartAppResource.bat`, which registers the application with Oracle Clusterware as a resource, use Oracle Clusterware commands to start and stop the Performance Management Architect server. Do not stop or start the application resource directly (for example, in the Windows services applet).

Editing `EPMA_CreateAndStartAppResource.bat`

You can edit `EPMA_CreateAndStartAppResource.bat` to specify values for these variables, which are listed at the top of the script:

- `ACTION_SCRIPT`—Full path and file name for the `EPMA_ActionScript.bat` file provided with your Performance Management Architect installation

  This batch file is the action script that Oracle Clusterware uses to manage the application resource (for example, Performance Management Architect Server).

- `FAILOVER_DELAY`—Number of seconds to wait before starting the failover process after a failure is detected

- `FAILURE_THRESHOLD`—Number of failures detected within a specified failure interval for a resource before Oracle Clusterware marks the resource as unavailable and stops monitoring it

  If a resource fails the specified number of times, then Oracle Clusterware stops the resource. If the value is 0, then failure tracking is disabled. The maximum value is 20.

- `FAILURE_INTERVAL`—Interval, in seconds, during which Oracle Clusterware applies the `FAILURE_THRESHOLD` attribute

  If the value is 0, failure tracking is disabled.

- `START_TIMEOUT`—Number of seconds that Oracle Clusterware waits for the application resource to start before declaring a failed start

- `STOP_TIMEOUT`—Number of seconds that Oracle Clusterware waits for the application resource to stop before declaring a failed stop

- `CHECK_INTERVAL`—Number of seconds between repeated checks

  Shortening intervals for more-frequent checks increases resource consumption if you use the script agent. To reduce resource consumption, use an application-specific agent.

- `RESTART_ATTEMPTS`—Number of times Oracle Clusterware attempts to restart a resource on the resource's current server before attempting to relocate it

  For example, if the value is 1, Oracle Clusterware attempts to relocate the resource after a second failure. A value of 0 indicates that there is no attempt to restart, but Oracle Clusterware always attempts to fail the resource over to another server.

- CRS_HOME–Full path to the BIN folder for your Oracle Clusterware installation

Stopping and Unregistering Application Resources

➤ To stop and unregister an application resource, run EPMA_StopAndDeleteAppResource.bat. The batch file runs in a command window and pauses when finished. Pressing any key closes the command window.

Checking Application Resource Status

After running EPMA_CreateAndStartAppResource.bat, you can run these commands from the command line one at a time, to display the status of your application resources:

- crsctl status resource epmavip -v
- crsctl status resource EPMAServer -v

Tip: Instead of running the commands individually, you can run EPMA_Status.bat, in *EPM_ORACLE_HOME*/products/Foundation/BPMA/AppServer/DimensionServer/ServerEngine/Failover, which runs both commands.

When the resources are running correctly, their status is STATE=ONLINE.

Oracle Clusterware runs the action script EPMA_ActionScript.bat with the check parameter at the check interval that is set when the application resource is created. If the action script returns a 1, indicating that the application is not running, it attempts to start the application on another node in the cluster.

After running EPMA_StopAndDeleteAppResource.bat, you can run this command from the command line to ensure that the resource no longer exists and that the Hyperion EPMA Server service is not running on any node in the cluster:

crsctl status resource EPMAServer -v

Setting the Performance Management Architect Server Logical Web Address

You use EPM System Configurator to set the Performance Management Architect Server logical Web address for the Hyperion EPMA Web Tier – Web Application service to the cluster address or name.

➤ To set the logical Web address in EPM System Configurator:

1 Select the EPM Oracle instance to configure, and then click **Next**.

2 Click **Uncheck All**.

3 Expand the tree.

4   Select **Hyperion Foundation | Configure Logical Address for Web Applications**, and then click **Next**.

5   For each Web application:

    a.   Select **Set the logical web address**.

    b.   For the **Product Component: DimensionServer**, double-click the value in the **Host** column.

    c.   Change the value to specify one of these items:

- SCAN (Single Client Access Name) if your RAC is Oracle 11*g* Release 2 or later
- Application VIP
- Host name alias that points to the application VIP

    d.   Click **Next**.

6   Click **Next** to finish the configuration.

7   Start the Hyperion EPMA Web Tier - Web Application service.

8   Wait a few minutes, and then log on to EPM Workspace.

5

Essbase Server Clustering and Failover

This chapter discusses clustering active-active and active-passive clustering of Essbase Server. For information about clustering Administration Services Web Application and Provider Services Web Application, see Chapter 8, "Clustering EPM System Web Applications."

Essbase Server Clustering Configurations

Essbase Server clustering can be active-passive or active-active.

Table 9 Essbase Server Clustering Configurations

Capability	Active-Passive	Active-Active
Write-back	Yes	No
Failover	Yes	Yes
Load balancing	No	Yes
High availability	Yes	Yes

Active-passive Essbase clusters support failover with write-back to databases. Active-passive Essbase clusters do not support load-balancing. Essbase failover clusters use the service failover functionality of the Oracle Process Manager and Notification Server server. A single Essbase installation is run in an active-passive deployment, and one host runs the Essbase agent and two servers. Oracle Process Manager and Notification Server stops, starts, and monitors the agent process. See "Active-Passive Essbase Clusters" on page 36.

Active-active Essbase clusters support high availability and load balancing. An active-active Essbase cluster supports read-only operations on the databases and should be used only for reporting.

Because active-active Essbase clusters do not support data write-back or outline modification, and they do not manage database replication tasks such as synchronizing the changes in one

database across all databases in the cluster, they do not support Planning. When Planning is configured to use Essbase in cluster mode as a data source, it does not support the ability to launch business rules with Oracle's Hyperion® Business Rules or Calculation Manager as the rules engine.

You can use Provider Services to set up active-active Essbase clusters. See .

Active-Passive Essbase Clusters

An active-passive Essbase cluster can contain two Essbase servers. To install additional Essbase servers, you must install an additional instance of Essbase. The application must be on a shared drive, and the cluster name must be unique within the deployment environment.

These types of shared drive are supported:

- SAN storage device with a shared disk file system supported on the installation platform such as OCFS

- NAS device over a supported network protocol.

   Note: Any networked file system that can communicate with an NAS storage device is supported, but the cluster nodes must be able to access the same shared disk over that file system.

SAN or a fast NAS device is recommended because of shorter I/O latency and failover times.

You set up active-passive Essbase clusters with EPM System Configurator. You specify the Essbase cluster information for each Essbase instance. You define the cluster when you configure the first instance of Essbase. When you configure the second instance, you associate the instance with the cluster.

Note: For a given physical Essbase server that Administration Services is administering, Administration Services displays only the name of the cluster to which that Essbase server belongs.

For instructions, see "Clustering Essbase Server" in Chapter 4, "Configuring EPM System Products," of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide.*

Active-Active Essbase Clusters

Using Provider Services, you can create active-active cluster of identical databases belonging to one Essbase server, to multiple Essbase servers on the same computer, or to Essbase servers distributed across multiple computers over the network.

Note: Essbase servers may be subject to licensing restrictions.

Provider Services clients include Smart View clients, custom Java application programming interface (API) clients, and XML for Analysis (XMLA) clients. Provider Services distributes client requests to database instances belonging to the cluster. An active-active Essbase cluster supports read-only operations on the databases; it does not support data write-back or outline modification. An active-active Essbase cluster does not manage database replication capabilities, such as synchronizing the changes in one database across all databases in the cluster.

After configuring a set of Essbase servers for active-active clustering, you must define and enable the cluster under the Provider Services node in the Enterprise View of Administration Services Console. See "Enabling Clustered Database Components" on page 39.

Configuring Active-Active Clusters with Provider Services

If Essbase is clustered with Provider Services and no third-party tool:

- Smart View must be used rather than Oracle Essbase Spreadsheet Add-in.
- Essbase has no write-back capability and should be used for reporting only; therefore, Planning is not supported.
- Nodes must be loaded and calculated individually.

Adding Servers to Active-Active Essbase Clusters

You must specify which servers a cluster includes.

➤ To add servers to an Essbase cluster, from Administration Services Console:

1 From **Enterprise View** or a custom view, select **Essbase Servers**.

2 For each server to be added:

    a. Right-click, and select **Add Essbase Servers**.

    b. In **Add Essbase Server**, enter the Essbase server name, user name, and password.

    c. Confirm the password that you entered in the preceding step.

3 From **Enterprise View** or a custom view, under the **Provider Services** node, select a provider.

4 Right-click and select **Create**, then **Create Essbase Cluster**.

5 Select **Add Essbase Cluster**, then **Cluster name**, and then enter a name for the cluster; for example, East Coast Sales.

6 Enter a short description; for example, East Coast sales databases.

7 Click **Add** to add servers to the cluster.

8 In **Select Cluster Component Database**, specify the Essbase server, application, and database names, and then click **OK**.

The Essbase server and associated application and database names are displayed under the cluster component list; for example, `localhost.Demo.Basic`. A cluster component comprises the Essbase server, application, and database name.

9   Repeat step 7 and step 8 to add any other components.

10 In **Add Cluster**, click **OK**.

The new cluster name is displayed under **Essbase Clusters**.

Removing Active-Active Essbase Clusters

➤   To remove an active-active Essbase cluster:

1   From **Enterprise View** or a custom view in Administration Services Console, under the **Provider Services** node, select a provider.

2   Under the provider node, select **Essbase Clusters**.

3   Under **Essbase Clusters**, select a cluster.

4   Right-click, and select **Remove**.

5   In **Remove Essbase Cluster**, click **Yes**.

The removal takes effect when you restart Provider Services.

Adding Components to Active-Active Essbase Clusters

When creating an Essbase cluster, specify associated Essbase servers, applications, databases.

➤   To add components to a cluster, from Administration Services Console:

1   From **Enterprise View** or a custom view, under the **Provider Services** node, select a provider.

2   Under the provider node, select the **Essbase Clusters** node.

3   Under the **Essbase Clusters** node, select the cluster.

4   Right-click, and select **Edit**.

5   In the **Essbase Cluster** panel, click **Add**.

6   In **Select Cluster Component Database**, specify the Essbase server, application, and database names.

7   Click **OK**.

The database component is listed in the **Essbase Cluster** panel.

8   To add more components, repeat step 5 through step 7 for each component.

9   Click **Apply**.

10 Click **Close**.

Removing Database Components

➤ To remove a database component from a active-active cluster, from Administration Services Console:

1 From Enterprise View or a custom view, under the **Provider Services** node, select a provider.

2 Under the **Provider** node, select the **Analytic Clusters** node.

3 Under the **Analytic Clusters** node, select a cluster.

4 Right-click, and select **Edit**.

5 For each database component to be removed, in the **Analytic Cluster** panel, select the component, and click **Remove**.

6 Click **Apply**.

7 Click **Close**.

Enabling Clustered Database Components

You can reenable a database component after disabling it.

Note: Components that were part of the cluster definition when Provider Services was started can be enabled and disabled dynamically with no need to restart Provider Services. However, if you add a component to a cluster or create a cluster, you must restart Provider Services for the new cluster definition to take effect. You can enable or disable the newly added components after restarting Provider Services.

➤ To enable clustered database components, from Administration Services Console:

1 From Enterprise View or a custom view, under the **Hyperion Provider Services** node, select a provider.

2 Under the **Provider** node, select the **Analytic Clusters** node.

3 Under the **Analytic Clusters** node, select a cluster.

4 Right-click, and select **Edit**.

5 For each database component to be enabled, in the **Analytic Cluster** panel, select the component, and click **Enable**.

The status of the database component changes to Enabled.

6 Click **Close**.

Note: Components that were part of the cluster definition when Provider Services was started can be enabled and disabled dynamically without restarting Provider Services. However, if you add a component to an existing cluster or create a cluster, you must restart Provider Services for the new cluster definition to take effect. You cannot enable or disable the newly added cluster components until you restart Provider Services.

Disabling Cluster Components

You can disable individual database components in a cluster. For example, you can take the component offline to update the database.

➤ To disable a database component in a cluster, from Administration Services Console:

1 From **Enterprise View** or a custom view, under the **Hyperion Provider Services** node, select a provider.

2 Under the provider node, select the **Essbase Clusters** node.

3 Under the **Essbase Clusters** node, select a cluster.

4 Right-click, and select **Edit**.

5 For each component to be disabled, in the **Essbase Cluster** panel, select the component, and click **Disable**.

6 Click **Close**.

Active-Active Essbase Clustering Examples

For simplicity, all examples in this section use Smart View.

Essbase Server Clusters

Provider Services enables you to group sets of Essbase servers running applications with identical databases and use them as one resource.

Note: When adding or deleting an Essbase server in a cluster, restart the server to reflect changes to the group. You can enable or disable components in the group without restarting the server.

Essbase Database Clusters

Clustering Essbase databases enables load balancing and failover support. Provider Services provides parallel clustering, in which a series of active, duplicate databases respond to user requests. Which database is accessed is transparent to users, who connect to and retrieve data from one data source. Provider Services facilitates the routing of connections between databases in a cluster, based on availability and precedence rules.

Figure 3   Essbase Database Clustering with Provider Services
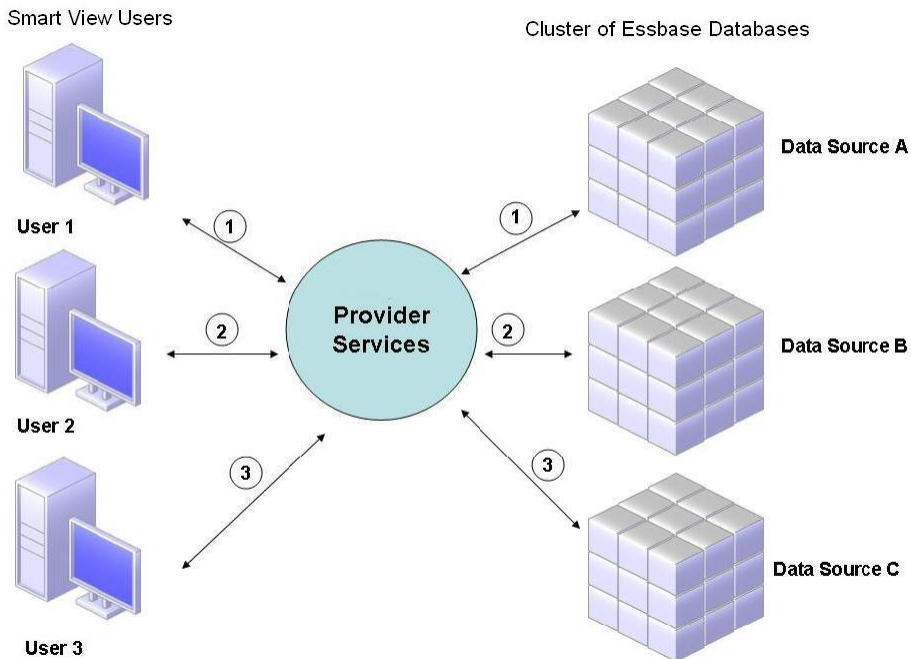
In Figure 3, Smart View users connect to Essbase through Provider Services.

Each user connection is assigned to a server during the Essbase session. Provider Services uses session-level load balancing. For example, in Figure 3, User 1's connection is mapped to Data Source A. User 2's connection is mapped to Data Source B. User 3's connection is mapped to data source C. All requests from User 1 are handled by Data Source A for the duration of the connection.

If data source A fails:

● User 1 times out at Data Source A.

● User 1 is rerouted to the next available data source, which is Data Source C in Figure 4.

Figure 4 illustrates what happens when Data Source A goes offline.

Figure 4   Database Cluster with One Data Source Offline
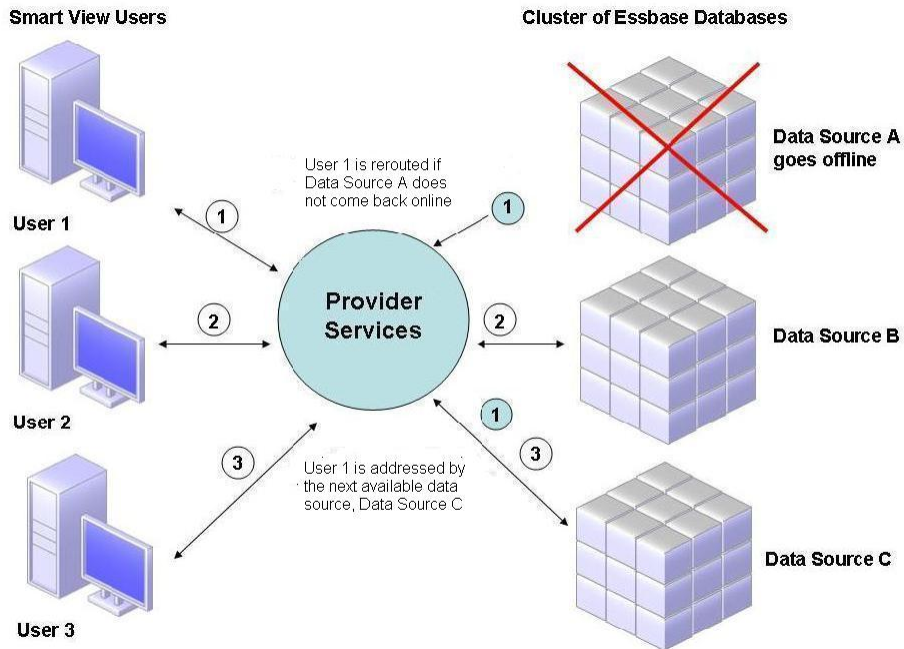
In Figure 4, the state of query 1 is maintained at the middle tier and rerouted. Provider Services also provides load balancing across servers.

Figure 5 depicts clustered databases deployed on one server.

Figure 5   Essbase Database Cluster on One Server
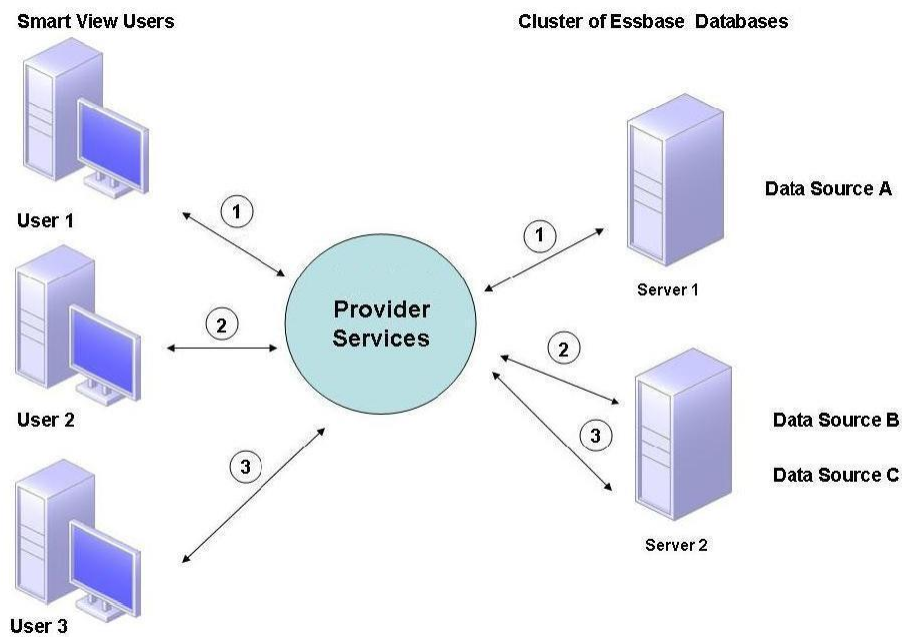
In Figure 5, two servers contain Essbase databases. Server 1 has four processors and 8 GB of RAM. Server 2 has eight processors and 16 GB of RAM. Because Server 2 has more resources, it contains Data Sources B and C. Therefore, Server 2 can handle both connections.

Failover support also applies for database clusters on one server. In Figure 6, Server 2 goes offline. User 2 and User 3 are then rerouted to the next available server, Server 1.

Figure 6   Failover for Database Cluster on One Server
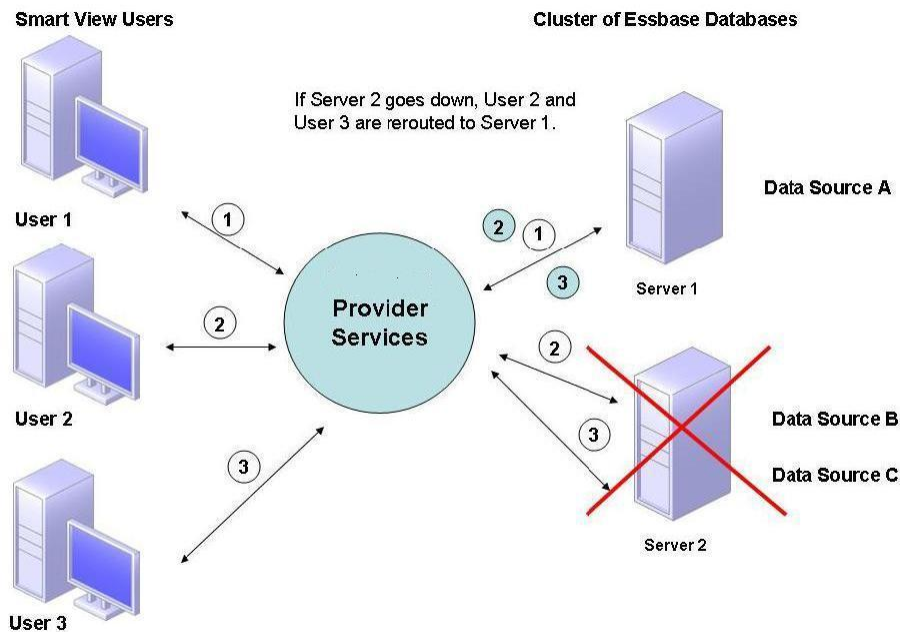
Connections to Essbase Clusters

Essbase clients and servers can connect to an Essbase cluster by way of a URL in this format:

```
http(s)://host:port/aps/Essbase?ClusterName=clusterName.
```

You can also connect to an Essbase cluster using only the cluster name, but you must first enable this by modifying a configuration file to specify the Provider Services server that resolves the cluster name in the URL. The Provider Services server is specified in these configuration files:

- For server-to-server communication—essbase.cfg

  Use this format :

  ```
  ApsResolver http(s)://host:port/aps
  ```

  You can specify several Provider Services servers in essbase.cfg, using a semicolon (:) between server names.

- For client-to-server communication—essbase.properties

  Use this format :

  ```
  ApsResolver=http(s)://host:port/aps
  ```

To connect to a Provider Services Essbase cluster using Financial Reporting or Web Analysis, you must configure Financial Reporting or Web Analysis for three -tier mode.

To configure Financial Reporting for three-tier mode:

1. Start *MIDDLEWARE_HOME*/EPMSystem11R1/products/financialreporting/bin/ FRConfig.cmd.

2. Specify the EssbaseJAPIServer as the Provider Services server.

3. Restart Financial Reporting, and enter the Provider Services cluster name as the **Server Name**.

To configure Web Analysis for three-tier mode:

1. Log on to EPM Workspace as an admin user.

2. Select **Navigate**, then **Administer**, then **Reporting and Analysis**, and then **Web Applications**.

3. Right-click **WebAnalysis Web-Application**, and select **Properties**.

4. On the **Essbase Configuration** tab, set these properties and then click **OK**:

   - EESEmbeddedMode=false (The default setting is true.)

   - EESServerName=*Provider Services server name* (The default setting is *localhost*.)

   - Click **OK**, and restart theWeb Analysis server for changes to take effect.

6

Reporting and Analysis Services Clustering

This chapter discusses clustering Reporting and Analysis services-tier components outside EPM System Configurator. See Chapter 8, "Clustering EPM System Web Applications," for information about clustering Reporting and Analysis Web applications through EPM System Configurator.

Reporting and Analysis Configuration for a Distributed Environment

Considerations if you are installing Reporting and Analysis in a distributed environment:

● Install only one instance of Reporting and Analysis Framework services and Interactive Reporting services on each host, and run EPM System Configurator on each machine. You can then use EPM Workspace to replicate services on each host. Each instance is part of the cluster and is used for load balancing and high availability. See "Clustering Reporting and Analysis Framework Services and Common Libraries" on page 46.

● The GSM and ServiceBroker services must be enabled on all instances of the Reporting and Analysis services for high availability of Reporting and Analysis. By default, the GSM and ServiceBroker services are enabled only on the first instance of the Reporting and Analysis services.

> **Note:** Clustering without high availability or failover does not require that the GSM and Service Broker services be enabled on all instances.

● If you are running multiple instances of the Reporting and Analysis Repository Service, all instances should share the file system location. Specify the file system location during configuration with EPM System Configurator, on the **Configure Reporting and Analysis Framework Services** page, or with the Administer section of EPM Workspace. If you are running this service as a Windows service, use a UNC path instead of a mapped drive. This

prevents potential permissions errors than can occur when Windows attempts to create a mapped drive at startup. See "Configure Reporting and Analysis Framework Services" in Chapter 4, "Configuring EPM System Products, " of the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*.

On Windows platforms, when replicating common Reporting and Analysis services and using the network shared folder for the repository location, run the Reporting and Analysis agent Windows service under a user account with sufficient privileges for the network shared folder (not under a Local System account).

● For the Financial Reporting Web application, you can have only one active instance of the Scheduler component in a clustered environment.

● Use the same path to *MIDDLEWARE_HOME* on all machines. (Otherwise, multiple Reporting and Analysis nodes are displayed in Shared Services.)

For more information about configuring Reporting and Analysis for a distributed environment, see the *Hyperion Reporting and Analysis Framework Administrator's Guide*.

Clustering Reporting and Analysis Framework Services and Common Libraries

You can cluster Reporting and Analysis Framework Services and Common Libraries by using EPM Workspace to configure multiple instances of a service on a computer.

➤ To cluster Reporting and Analysis Framework Services and Common Libraries:

1 Log on to EPM Workspace as an administrator.

2 Select **Navigate**, then **Administer**, then **Reporting and Analysis**, and then **Services**.

3 Right-click an agent for a **Reporting and Analysis Framework** service, and select **Copy**.

4 Enter a name and port range for the new configuration, and then click **OK**.

Clustering GSM

You can cluster GSM after installing and configuring Reporting and Analysis on two machines.

➤ To cluster GSM:

1 On the second machine where you have configured Reporting and Analysis, log on to EPM Workspace.

2 Select **Navigate**, then **Reporting and Analysis**, and then **Services**.

3 Right-click **Reporting and Analysis**, and then select **Properties**.

4 On the **Services** tab, set **GSM** to **Enabled**.

Clustering Interactive Reporting Services

You can cluster Interactive Reporting services through EPM Workspace to create multiple instances of a service on a computer.

➤ To cluster Interactive Reporting services:

1 Log on to EPM Workspace as an administrator.

2 Select **Navigate**, then **Administer**, then **Reporting and Analysis**, and then **Services**.

3 Right-click an agent for a **Interactive Reporting** service, and select **Copy**.

4 Enter a new port range and then click **OK**.

Financial Reporting Print Server Clusters

You can deploy the Financial Reporting Print Server in an active-active configuration, with one installation on each machine. No manual steps are required to achieve load balancing and failover, but you must configure and register Financial Reporting Print Server manually before you set up clustering.

➤ To configure and register the Financial Reporting Print Server:

1 From a command line, navigate to the directory where Financial Reporting Studio is installed. The default installation directory is `Financial_Reporting_Studio_Installation_Directory/ products/financialreporting/install/bin`, and open `FRSetupPrintServer.properties` in a text editor.

The default installation directory for Financial Reporting Studio is `c:/Program Files/ Oracle/FinancialReportingStudio`.

2 Specify the Financial Reporting Server URL and the administrator credentials used to register the Financial Reporting Print Server:

- `FRWebServer=http://server:port`

  Specify the same server URL that is used for connecting from Financial Reporting Studio, and ensure that the server is running.

- `AdminUser=user name`

- `AdminPassword=password`

3 From a command line, navigate to `Financial_Reporting_Studio_Installation_Directory/products/ financialreporting/install/bin`, and run this command:

`FRSetupPrintServer.cmd`

4 Ensure that the Financial Reporting Print Server service has been created and started.

Note: You might need to start the service manually the first time.

7

Data Management Services Clustering

This chapter discusses clustering Data Management product components outside EPM System Configurator. See Chapter 8, "Clustering EPM System Web Applications," for information about clustering ERP Integrator, which is done through EPM System Configurator.

FDM Clusters

FDM Application Server can be clustered with the FDM proprietary load balancer. For instructions on configuring the load balancer, see the *Oracle Hyperion Financial Data Quality Management, Fusion Edition Configuration Guide.*

You can set up Oracle HTTP Server as a load balancer for FDM IIS Web applications. For instructions, see "Load Balancing Financial Management or FDM Web Applications on IIS" in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*.

Using EPM System Configurator, you can cluster FDM Web application for high availability with either Oracle HTTP Server or third-party load balancers. For instructions, see "Load Balancing Financial Management or FDM Web Applications on IIS" in Chapter 4, "Configuring EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*. For instructions on clustering the FDM relational database, see the documentation for the database software.

Figure 7 shows a scenario with an FDM relational database clustered for failover and high availability on proprietary EPM System application servers.

Figure 7   FDM Clustered for Failover and High Availability
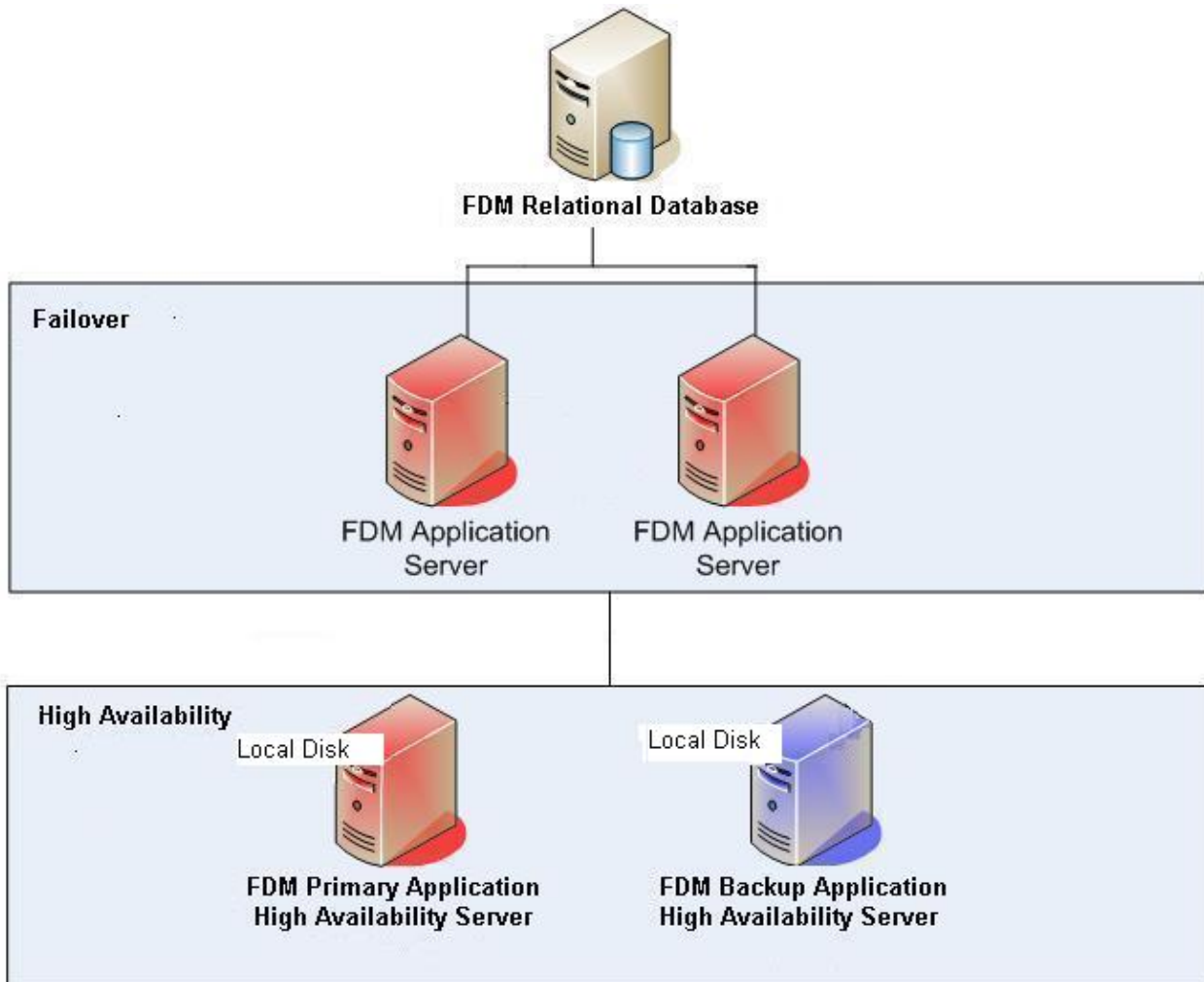
Data Relationship Management Clusters

You can cluster Data Relationship Management Web applications with either Oracle HTTP Server or third-party load balancers. For instructions on clustering with Oracle HTTP Server, see "Configuring Load Balancing for Data Relationship Management Web Applications" in the *Oracle Hyperion Data Relationship Management Installation Guide*.

Data Relationship Management Server applications can be clustered for load-balancing only, using a primary-secondary machine configuration. Long-running read-only operations can be processed on secondary application servers, to reduce the processing load on the primary application server that is handling write operations. For instructions on configuring Data Relationship Management Server applications for load-balancing, see "Configuring Host Machines" in the *Oracle Hyperion Data Relationship Management Installation Guide*.

Note: The processing of requests by application servers may not be distributed evenly among the machines in the cluster. Routing to a specific machine is based on the data being accessed and the type of operation being performed.

With Data Relationship Management installed in a clustered database environment, you can select **Generate scripts to be run by a database administrator** when creating a database from the Repository Wizard in the Data Relationship Management Configuration Console. Two scripts are generated: one for creating the schema owner, or database, and one for creating the database schema objects. For instructions on clustering the Data Relationship Management repository, see the documentation for the database software being used.

8

Clustering EPM System Web Applications

This chapter assumes that you are familiar with WebLogic administration and clustering. If you are unfamiliar with these tasks, Oracle urges you to seek technical assistance before attempting to cluster an EPM System Web application.

Prerequisites

Note: The information in this section assumes that you have installed your Web applications on each node to be included in the cluster, using procedures provided in Chapter 3, "Installing EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide.*

Complete these tasks before setting up a cluster for an EPM System Web application:

- Enable either session persistence or sticky sessions (which direct all requests for a specific session to the same server) on the load balancer.

- Ensure that all the computers to be included in the cluster use either Windows or UNIX but not both.

- Install the EPM System product on each node that the cluster will include. Install to the same file system location on each machine. Using the same file system path on each physical machine in a cluster is important so that these environment variables can be set once for the entire cluster, rather than set and customized for each node in the cluster:

  - All OS—`CLASSPATH` and `PATH`

  - UNIX—`LD_LIBRARY_PATH`, `LIBPATH`, or `SHLIB_PATH`

  For information about additional requirements, see these sections in Chapter 3, "Installing EPM System Products," in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*:

  - "Installing EPM System Products in a Distributed Environment"

○ "Configuring EPM System Products in a Distributed Environment"

○ "Configuring Products in a Clustered Environment"

Clustering Web Applications in a Manual Deployment

You can cluster a manually deployed Web application using WebLogic. This section provides a general overview of clustering Web applications. See the WebLogic documentation for more details on this procedure. For information about setting up load balancing for a Financial Management or FDM Web application, see "Load Balancing Financial Management or FDM Web Applications on IIS" in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*.

Note: If you deployed Web applications using EPM System Configurator, EPM System Configurator creates the cluster and adds servers to the cluster. You need not perform additional tasks in WebLogic. See "Clustering Web Applications" in the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*.

➤ To cluster Web applications:

1 **Start the WebLogic Administration Console.**

2 **If you manually deployed the Web applications, in the Domain Structures pane, click Clusters and create a cluster.**

If you deployed the Web applications with EPM System Configurator and clicked Setup to specify the logical address for the Web application, this step is not necessary, because EPM System Configurator created the cluster for you.

3 **If you manually deployed the Web applications, select the cluster, click the HTTP tab, and for Frontend Host, enter the host name and port of the load balancer.**

If you deployed the Web applications with EPM System Configurator and clicked Setup to specify the logical address for the Web application, this step is not necessary, because EPM System Configurator entered this information during configuration.

4 **Click the Servers tab, click Add, and on the Add a Server to Cluster page, select a server from the list, and then click Finish.**

5 **Click the Deployments tab, select an EPM System Web application, click the Targets tab, and for the cluster this Web application is deployed to, select All Servers in the Cluster.**

Repeat this step for all EPM System Web applications.

In a distributed environment, the Node Manager propagates changes to all the machines in the cluster.

6 **To add another server to the cluster to scale out the deployment:**

a. Select the server and select **Clone**.

b. Select the server that you just cloned, and change the machine on which the server is running.

7   Repeat step 2through step 6 as needed.

8   Start the servers from WebLogic Administration Console.

9   Launch EPM System Configurator and perform the "Configure Web Server" task.

A   Additional Information

For more information about installing, configuring, and using these Oracle Hyperion Enterprise Performance Management System products, see the product guides in the Oracle Documentation Library (http://www.oracle.com/technology/documentation/epm.html) on the Oracle® Technology Network.

- Oracle Hyperion Enterprise Performance Management System Installer, Fusion Edition; Oracle's Hyperion Enterprise Performance Management System Configurator; Oracle's Hyperion Enterprise Performance Management System Diagnostics; Oracle's Hyperion Shared Services Registry

- Foundation Services

  - Oracle's Hyperion® Foundation Services (includes Oracle's Hyperion® Shared Services, Oracle Hyperion Enterprise Performance Management System Lifecycle Management, and Oracle Enterprise Performance Management Workspace, Fusion Edition)

  - Oracle HTTP Server

  - Oracle WebLogic Server

  - Oracle Hyperion EPM Architect, Fusion Edition

  - Hyperion Calculation Manager

  - Oracle Hyperion Smart View for Office, Fusion Edition

- Essbase

  - Oracle Essbase Server

  - Oracle Essbase Administration Services

  - Oracle Essbase Integration Services

  - Oracle Hyperion Provider Services

  - Oracle Essbase Studio

- Oracle's Hyperion Reporting and Analysis

  - Oracle's Hyperion Reporting and Analysis Framework

  - Oracle's Hyperion® Interactive Reporting

  - Oracle Hyperion Financial Reporting, Fusion Edition

  - Oracle's Hyperion® SQR® Production Reporting

  - Oracle's Hyperion® Web Analysis

- Oracle's Hyperion® Financial Performance Management Applications

- Oracle Hyperion Planning, Fusion Edition
- Oracle Hyperion Financial Management, Fusion Edition
- Oracle Hyperion Performance Scorecard, Fusion Edition
- Oracle Hyperion Profitability and Cost Management, Fusion Edition
- Oracle Hyperion Disclosure Management
- Oracle Hyperion Financial Close Management

- Data Management Products
  - Oracle Hyperion Financial Data Quality Management, Fusion Edition
  - Oracle Hyperion Financial Data Quality Management ERP Integration Adapter for Oracle Applications
  - Oracle Hyperion Data Relationship Management, Fusion Edition

Glossary

active-active high availability system A system in which all the available members can service requests, and no member is idle. An active-active system generally provides more scalability options than an active-passive system. Contrast with active-passive high availability system.

active-passive high availability system A system with active members, which are always servicing requests, and passive members that are activated only when an active member fails. Contrast with active-active high availability system.

application server cluster A loosely joined group of application servers running simultaneously, working together for reliability and scalability, and appearing to users as one application server instance. See also vertical application cluster and horizontal application cluster.

assemblies Installation files for EPM System products or components.

asymmetric topology An Oracle Fusion Middleware Disaster Recovery configuration that is different across tiers on the production site and standby site. For example, an asymmetric topology can include a standby site with fewer hosts and instances than the production site.

backup A duplicate copy of an application instance.

cluster An array of servers or databases that behave as a single resource which share task loads and provide failover support; eliminates one server or database as a single point of failure in a system.

cluster interconnect A private link used by a hardware cluster for heartbeat information, to detect node failure.

cluster services Software that manages cluster member operations as a system. With cluster services, you can define a set of resources and services to monitor through a heartbeat mechanism between cluster members and to move these resources and services to a different cluster member as efficiently and transparently as possible.

Disaster Recovery The ability to safeguard against natural or unplanned outages at a production site by having a recovery strategy for applications and data to a geographically separate standby site.

EPM Oracle home A subdirectory of Middleware home containing the files required by EPM System products. The EPM Oracle home location is specified during installation with EPM System Installer.

EPM Oracle instance A directory containing active, dynamic components of EPM System products (components that can change during run-time). You define the EPM Oracle instance directory location during configuration with EPM System Configurator.

external authentication Logging on to Oracle EPM System products with user information stored outside the application. The user account is maintained by the EPM System, but password administration and user authentication are performed by an external service, using a corporate directory such as Oracle Internet Directory (OID) or Microsoft Active Directory (MSAD).

failover The ability to switch automatically to a redundant standby database, server, or network if the primary database, server, or network fails or is shut down. A system that is clustered for failover provides high availability and fault tolerance through server redundancy and fault-tolerant hardware, such as shared disks.

hardware cluster a collection of computers that provides a single view of network services (for example, an IP address) or application services (such as databases and Web servers) to clients of these services. Each node in a hardware cluster is a standalone server that runs its own processes. These processes can communicate with one another to form what looks like a single system that cooperatively provides applications, system resources, and data to users.

high availability A system attribute that enables an application to continue to provide services in the presence of failures. This is achieved through removal of single points of failure, with fault-tolerant hardware, as well as server clusters; if one server fails, processing requests are routed to another server.

horizontal application server cluster A cluster with application server instances on different machines.

identity A unique identification for a user or group in external authentication.

installation assemblies Product installation files that plug in to EPM System Installer.

Java application server cluster An active-active application server cluster of Java Virtual Machines (JVMs).

lifecycle management The process of migrating an application, a repository, or individual artifacts across product environments.

load balancer Hardware or software that directs the requests to individual application servers in a cluster and is the only point of entry into the system.

load balancing Distribution of requests across a group of servers, which helps to ensure optimal end user performance.

locale A computer setting that specifies a location's language, currency and date formatting, data sort order, and the character set encoding used on the computer. Essbase uses only the encoding portion. See also encoding, ESSLANG.

logical Web application An aliased reference used to identify the internal host name, port, and context of a Web application. In a clustered or high-availability environment, this is the alias name that establishes a single internal reference for the distributed components. In EPM System, a nonclustered logical Web application defaults to the physical host running the Web application.

managed server An application server process running in its own Java Virtual Machine (JVM).

Middleware home A directory that includes the Oracle WebLogic Server home and can also include the EPM Oracle home and other Oracle homes. A Middleware home can reside on a local file system or on a remote shared disk that is accessible through NFS.

migration The process of copying applications, artifacts, or users from one environment or computer to another; for example, from a testing environment to a production environment.

migration log A log file that captures all application migration actions and messages.

migration snapshot A snapshot of an application migration that is captured in the migration log.

native authentication The process of authenticating a user name and password from within the server or application.

Oracle home A directory containing the installed files required by a specific product, and residing within the directory structure of Middleware home. See also Middleware home.

permission A level of access granted to users and groups for managing data or other users and groups.

provisioning The process of granting users and groups specific access permissions to resources.

proxy server A server acting as an intermediary between workstation users and the Internet to ensure security.

relational database A type of database that stores data in related two-dimensional tables. Contrast with multidimensional database.

repository Storage location for metadata, formatting, and annotation information for views and queries.

restore An operation to reload data and structural information after a database has been damaged or destroyed, typically performed after shutting down and restarting the database.

role The means by which access permissions are granted to users and groups for resources.

security agent A Web access management provider (for example, Oracle Access Manager, Oracle Single Sign-On, or CA SiteMinder) that protects corporate Web resources.

security platform A framework enabling Oracle EPM System products to use external authentication and single sign-on.

shared disks See shared storage.

Shared Services Registry The part of the Shared Services repository that manages EPM System deployment information for most EPM System products, including installation directories, database settings, computer names, ports, servers, URLs, and dependent service data.

shared storage A set of disks containing data that must be available to all nodes of a failover cluster; also called shared disks.

silent response files Files providing data that an installation administrator would otherwise be required to provide. Response files enable EPM System Installer or EPM System Configurator to run without user intervention or input.

single point of failure Any component in a system that, if it fails, prevents users from accessing the normal functionality.

single sign-on (SSO) The ability to log on once and then access multiple applications without being prompted again for authentication.

symmetric topology An Oracle Fusion Middleware Disaster Recovery configuration that is identical across tiers on the production site and standby site. In a symmetric topology, the production site and standby site have the identical number of hosts, load balancers, instances, and applications. The same ports are used for both sites. The systems are configured identically and the applications access the same data.

token An encrypted identification of one valid user or group on an external authentication system.

upgrade The process of deploying a new software release and moving applications, data, and provisioning information from an earlier deployment to the new deployment.

user directory A centralized location for user and group information, also known as a repository or provider. Popular user directories include Oracle Internet Directory (OID), Microsoft Active Directory (MSAD), and Sun Java System Directory Server.

vertical application server cluster A cluster with multiple application server instances on the same machine.

WebLogic Server home A subdirectory of Middleware home containing installed files required by a WebLogic Server instance. WebLogic Server home is a peer of Oracle homes.