

ORACLE® HYPERION ENTERPRISE PERFORMANCE
MANAGEMENT SYSTEM

RELEASE 11.1.1.3

HIGH AVAILABILITY GUIDE

ORACLE®
ENTERPRISE PERFORMANCE
MANAGEMENT SYSTEM

EPM System High Availability Guide, 11.1.1.3

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1

About High Availability

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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 your Java application server
- A strong understanding of your organization's security infrastructure, including authentication providers such as Oracle Internet Directory, Lightweight Directory Access Protocol (LDAP), Microsoft Active 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) (<http://www.oracle.com/technology/documentation/epm.html>) on Oracle® Technology Network.

[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	<i>Oracle Hyperion Enterprise Performance Management System Certification Matrix</i> (http://www.oracle.com/technology/products/bi/hyperion-supported-platforms.html)
Planning the installation	<i>Hyperion Installation Start Here</i>
<ul style="list-style-type: none"> ● Installing and configuring EPM System products ● Automatically deploying EPM System products ● Starting EPM System products ● Validating the installation ● Upgrading EPM System products 	<i>Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide</i>
Securing EPM System and provisioning users	<i>Oracle Hyperion Enterprise Performance Management System Security Administration Guide</i>

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
Manually deploying EPM System products	<i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i>
Creating a backup of product and application data	<i>Oracle Hyperion Enterprise Performance Management System Backup and Recovery Guide</i>
Migrating from one environment to another	<i>Oracle Hyperion Enterprise Performance Management System Lifecycle Management Guide</i>
Enabling SSL	<i>Oracle Hyperion Enterprise Performance Management System SSL Configuration Guide</i>

Terminology

The definitions in this section can help you to understand the information that this book presents about clustering EPM System services and products for high availability.

Active-Active System

An active-active system is one in which all the available members of the system can service requests, and no member is idle. An active-active system generally provides more scalability options than an [active-passive](#) system.

Active-Passive System

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

Cluster

A cluster is a group of linked hardware or software components that communicate with each other and act as one system to support [high availability](#), [failover](#), [load balancing](#), or other benefits. For example, a cluster might comprise multiple computers hosting multiple instances of a database. There are two types of clusters: [application server clusters](#) and [hardware clusters](#).

Application Server Cluster

An application server cluster is a loosely joined group of application servers running simultaneously, working together for reliability and scalability, and appearing to users as one application server instance.

Application server cluster types:

- Vertical—The application server instances are on the same machine.
- Horizontal—The application server instances are on different machines. You can increase the capacity of a cluster by adding application server instances to a machine or by adding machines that run new server instances.

Hardware Cluster

A hardware cluster is 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.

A hardware cluster achieves [high availability](#) through the use of specialized hardware ([cluster interconnect](#), [shared storage](#)) and software (health monitors, resource monitors). While the number of nodes that can be configured in a hardware cluster is vendor-dependent, this document assumes that two nodes are used in a failover cluster topology to provide high availability.

Java Application Server Cluster

A Java application server cluster is an [active-active](#) application server cluster of Java Virtual Machines (JVMs).

Cluster Interconnect

A cluster interconnect is a private link that used by a [hardware cluster](#) for heartbeat information, to detect node failure.

Cluster Services

Cluster services is 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.

Failover

Failover is 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.

In an [active-passive system](#), the passive member is activated during the failover operation and consumers are directed to it instead of the failed member. You can automate failover by setting up cluster services to detect failures and move cluster resources from the failed node to the standby node.

In a [load-balanced active-active system](#), the load balancer serving requests to the active members performs the failover. If an active member fails, the load balancer automatically redirects requests for the failed member to the surviving active members.

Some active-active scenarios in failover clusters involve different applications running in active-passive configuration to enable better use of hardware resources. For example, one node is the active server for application A, and another node is the active server for application B, and both applications are configured in active-passive mode on both servers. Usually, both nodes are used at the same time by different applications, but if one node fails, the applications on the failed node are relocated to the remaining node.

High Availability

High availability is 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.

Information about high-availability architecture is available at this Web site: <http://www.oracle.com/technology/deploy/availability/htdocs/maa.htm>.

Load Balancing

Load balancing is distribution of requests among application servers to guarantee consistent performance under load. A load balancer, which is the only point of entry into the system, directs the requests to individual application servers. Hardware and software load balancers are available.

Shared Storage

Shared storage, also called shared disks, is a set of disks containing data that must be available to all nodes of a failover cluster. Although each hardware cluster node is a standalone server running its own set of processes, the storage subsystem required for any cluster-aware purpose is usually shared. These fault-tolerant disks may contain critical data and cluster information. If shared storage is not required, a load-balanced approach should be considered, because the processes do not require shared data and need not run in a failover cluster.

Single Point of Failure

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

High Availability and Load Balancing for EPM System Components

The following list specifies supported clustering methodologies for EPM System product and components (with sublists for components) and options for removing single points of failure from the architecture and maintaining consistent performance through load balancing.

- Oracle's Hyperion® Foundation Services
 - Oracle's Hyperion® Shared Services Web application and Native Directory
 - ❑ Active-passive clustering for failover, using OID or OpenLDAP as Native Directory
 - ❑ Active-active clustering for load balancing and failover, using OID as Native Directory

See these documents, which you can download from <http://www.oracle.com/technology/products/bi/resource-library.html>:

- ❑ *Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.2 Active-Active Clusters*
- ❑ *Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.X Active-Passive Failover Clusters (UNIX Environments)*
- ❑ *Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.X Active-Passive Failover Clusters (Windows Environments)*

- Oracle Enterprise Performance Management Workspace, Fusion Edition Web application—Java application server clustering for high availability and load balancing
See the *Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide*.

EPM Workspace services—Clustering for high availability and failover through the Oracle's Hyperion Reporting and Analysis Configuration and Monitoring Console (CMC)

See the “Configuring Services Using CMC” chapter in the *Oracle Enterprise Performance Management Workspace Administrator's Guide* and [Chapter 2, “Clustering EPM System Services.”](#)

- Oracle Hyperion EPM Architect, Fusion Edition Web application—Java application server clustering for high availability and load balancing

Either session persistence or sticky sessions (which directs all requests for a specific session to the same server) should be enabled on the Java application server for clustering support.

See the *Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide*.

- Performance Management Architect Dimension Server—None
- Performance Management Architect Data Synchronization Web application—Java application server clustering for high availability and load balancing

See the *Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide*.

- Hyperion Calculation Manager Web application—Java application server clustering for high availability

See the *Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide*.

- Oracle Essbase—Clustering with Oracle Hyperion Provider Services for high availability and load balancing

Note: High availability for Essbase with Provider Services does not support write-back.

See the *Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide*.

- Essbase Administration Services—None
- Oracle Essbase Integration Services Server—None
- Essbase services
- Oracle Essbase Studio Server—None
- Essbase services—Provider Services clustering for high availability and load-balancing (read-only)

See [Chapter 3, “Clustering EPM System Products with Proprietary Application Servers.”](#)

- Provider Services Web application—Java application server clustering for high availability and load-balancing

See the *Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide*.

- Reporting and Analysis
 - Oracle's Hyperion® Interactive Reporting Service
 - Oracle Hyperion Financial Reporting, Fusion Edition Web application
 - Financial Reporting services
 - Oracle's Hyperion® Web Analysis Web application
- Financial applications
 - Oracle Hyperion Planning, Fusion Edition Web application
 - Oracle Hyperion Financial Management, Fusion Edition proprietary application server
 - Oracle Hyperion Profitability and Cost Management, Fusion Edition Web application
 - Oracle Hyperion Performance Scorecard, Fusion Edition Web application
- Data management applications
 - Oracle Hyperion Financial Data Quality Management, Fusion Edition
 - Oracle Hyperion Data Relationship Management, Fusion Edition

[Table 3](#) lists the supported clustering methodologies for EPM System products and components and indicates whether high availability and load balancing are supported for each component. The table also includes notes and references to additional information.

Table 3 EPM System High Availability and Load Balancing Matrix

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes/References
Shared Services Web application / Native Directory	Active-active or active-passive cluster for Web application and Native Directory	Yes	Only with active-active clusters, using Oracle Internet Directory (OID) as Native Directory	See one of these papers, which you can download from http://www.oracle.com/technology/products/bi/resource-library.html : <ul style="list-style-type: none"> ● <i>Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.2 Active-Active Clusters</i> ● <i>Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.X Active-Passive Failover Clusters (UNIX Environments)</i> ● <i>Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.X Active-Passive Failover Clusters (Windows Environments)</i>
EPM Workspace Web application	Java application server clustering	Yes	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes/References
EPM Workspace services	Clustering through the Reporting and Analysis Configuration and Monitoring Console	Yes	Yes	See the “Configuring Services Using CMC” chapter in the <i>Oracle Enterprise Performance Management Workspace Administrator’s Guide</i> and Chapter 2, “Clustering EPM System Services.”
Performance Management Architect Web application	Java application server clustering	Yes	Yes	Either session persistence or sticky sessions (which directs all requests for a specific session to the same server) should be enabled on the Java application server for clustering support. See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .
Performance Management Architect Dimension Server	None	No	No	None
Oracle Hyperion EPM Architect, Fusion Edition Data Synchronizer Web application	Java application server clustering	Yes	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .
Hyperion Calculation Manager Web application	Java application server clustering	Yes	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .
Essbase	Clustering with Provider Services	Yes	Yes	High availability for Essbase with Provider Services does not support write-back. See “Clustering with Provider Services” on page 30.
Oracle Essbase Administration Services	None	No	No	None
Oracle Essbase Integration Services Server	None	No	No	None
Oracle Essbase Studio Server	None	No	No	None
Essbase services	Provider Services clustering	No	Yes, read-only	See Chapter 3, “Clustering EPM System Products with Proprietary Application Servers.”
Provider Services Web application	Java application server clustering	Yes	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes/References
Interactive Reporting Service	Clustering through the Reporting and Analysis Configuration and Monitoring Console	Yes	Yes	See the “Configuring Services Using CMC” chapter in the <i>Oracle Enterprise Performance Management Workspace Administrator’s Guide</i> and Chapter 2, “Clustering EPM System Services.”
Financial Reporting Web application	Java application server clustering	Yes	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .
Financial Reporting services	Installation of multiple Financial Reporting services in an active-active configuration	Yes	No	Each Financial Reporting Web application distributes requests among each configured Financial Reporting services to achieve load balancing. References: <ul style="list-style-type: none"> ● <i>Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide</i> ● Chapter 2, “Clustering EPM System Services”
Web Analysis Web application	Java application server clustering	Yes	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .
Planning Web application	Java application server clustering	Yes	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .
Financial Management proprietary application server	Clustering through Oracle's Hyperion Enterprise Performance Management System Configurator	Yes	Yes	See “Financial Management Clustering” on page 27 .
Oracle Hyperion Profitability and Cost Management, Fusion Edition Web application	Java application server clustering	Yes, in an active-passive system configuration	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .
Oracle Hyperion Performance Scorecard, Fusion Edition Web application	Java application server clustering	Yes	Yes	See the <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> .
FDM	FDM proprietary load balancer	Yes	Yes	FDM databases can be clustered. See the database software documentation.

Product/ Component	Supported Methodology	High Availability	Load Balancing	Notes/References
FDM Web application	Multiple Microsoft Internet Information Services (IIS) instances deployed in an active-active configuration	Yes	Yes	See “FDM Clusters” on page 26.
Oracle Hyperion Financial Data Quality Management ERP Integrator	Java application server clustering	Yes	Yes	See these resources: <ul style="list-style-type: none"> ● <i>Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide</i> ● The documentation for your application server ● The documentation for your RDBMS
Data Relationship Management	Multiple Microsoft IIS instances deployed in an active-active configuration	No	Yes	See Chapter 3, “Clustering EPM System Products with Proprietary Application Servers.”

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Clustering EPM System Services

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Shared Services Clustering

You can eliminate single points of failure from Shared Services by setting up clusters for Shared Services Web application and Native Directory and by clustering the Shared Services database. You have two options:

- Active-active cluster for load balancing and failover, using OID as Native Directory
- Active-passive failover cluster using OID or OpenLDAP as Native Directory

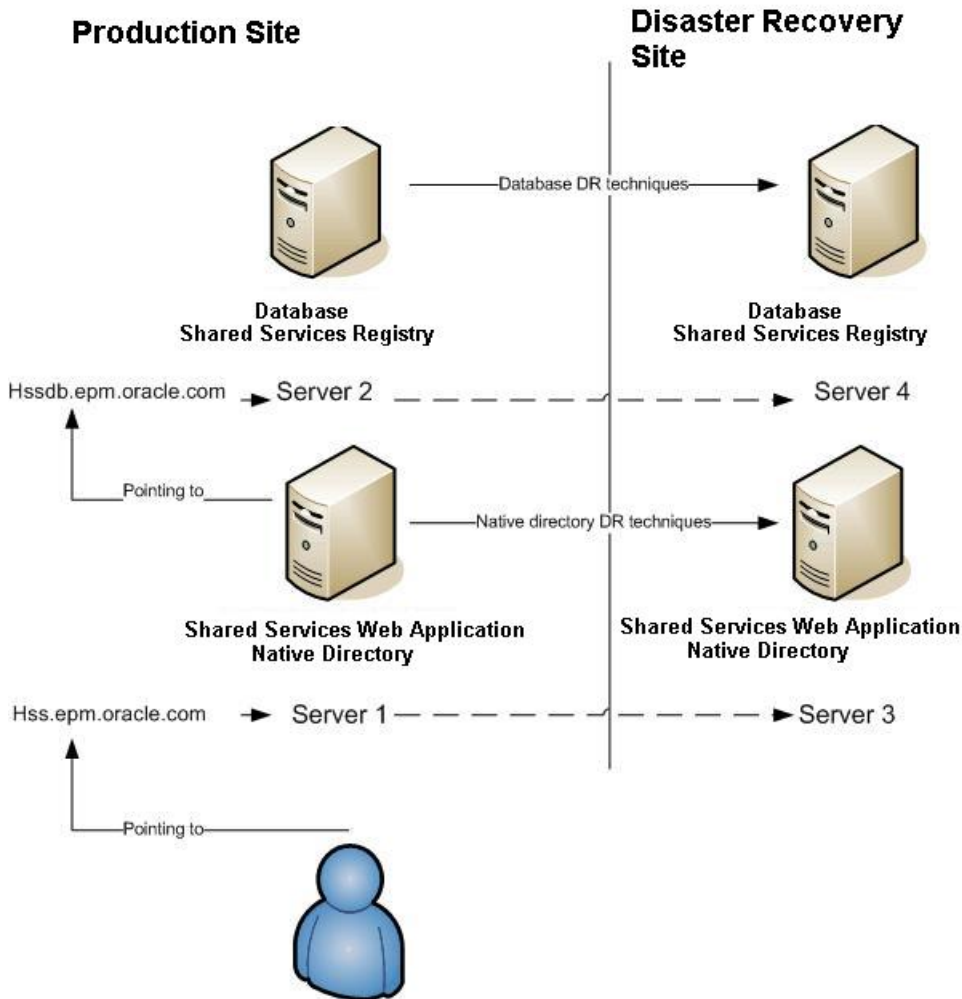
For instructions, see one of these documents, which you can download from <http://www.oracle.com/technology/products/bi/resource-library.html>:

- *Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.2 Active-Active Clusters*
- *Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.X Active-Passive Failover Clusters (Windows Environments)*
- *Oracle Hyperion Enterprise Performance Management System Hyperion Shared Services Release 11.1.1.X Active-Passive Failover Clusters (UNIX Environments)*

Setting Up Shared Services for Disaster Recovery

The procedures in this section create the disaster recovery setup illustrated in [Figure 1](#).

Figure 1 Shared Services Set Up for Disaster Recovery



► To set up Shared Services for disaster recovery during installation as shown in [Figure 1](#):

1 Create a Domain Name Service (DNS) alias for Shared Services, resolving to Server 1 or Server 3.

For example, if you create the alias `hss.example.com`, users can access Shared Services at `http://hss.epm.oracle.com:28080/interop`.

2 Create a DNS alias for the database server (for example, `hssdb.example.com`).

There are two database servers, but you need only one DNS alias, which points to the server that is in use. For example, if you have DB Server 2 and DB Server 4, set the DNS alias to point to DB Server 2; for disaster recovery, reset the DNS alias to point to DB Server 4.

3 Install and configure the Shared Services Web application on Server 1.

Using EPM System Configurator:

- Enter the `hssdb.epm.oracle.com` DNS as the database host name.
- In Advanced Setup for Shared Services Web application deployment, enter the `hss.epm.oracle.com:28080` name.

4 Install and configure the Shared Services Web application on the disaster recovery server.

Using EPM System Configurator:

- Enter the `hssdb.epm.oracle.com` DNS as the database host name.

Note: Hssdb still points to the database on Server 2.

- Deploy Oracle's Hyperion® Shared Services Web application on the disaster recovery server (Server 3 in the diagram).

5 Configure a database mirror on disaster recover Server 4, using log shipping or other disaster recovery techniques.

6 Set up Native Directory:

- a. Run `HYPERION_HOME/products/Foundation/server/scripts/backup_file backup_location`, where `backup_file` is `backup.bat` (Windows) or `backup.sh` (UNIX).
- b. Copy the files in `backup_location` to the disaster recovery server.

7 Configure Native Directory data replication using OID clustering techniques. See the *Oracle® Application Server High Availability Guide*.

► To enable disaster recovery if Shared Services is already installed:

1 Using Lifecycle Management, change the logical Web application host in the EPM System registry:

- a. Log on to Oracle's Hyperion® Shared Services Console.
- b. Click **Application Groups**, then **Foundation**, then **Deployment Metadata**.
- c. Expand **Shared Services Registry**, then **Foundation Services**, then **Shared Services**, and then **Logical web app**.
- d. Right-click **Logical web app Properties**, select **Export for Edit**, and save the file on a local drive.
- e. Change the host in `LOGICAL_WEB_APP.properties` to `hss.epm.oracle`.
- f. Save and close the properties file.
- g. Repeat [step 1.b](#) and [step 1.c](#), right-click **Logical web app Properties**, and select **Import after Edit**.
- h. Click **Browse** to locate the edited file on the local drive, then click **Finish**.

2 Using Lifecycle Management, edit the `CSSConfig` file in the Oracle's Hyperion Shared Services Registry.

- a. Log on to the Shared Services Console.
- b. Click **Application Groups**, then **Foundation**, then **Deployment Metadata**.
- c. Expand **Shared Services Registry**, then **Foundation Services**, and then **Shared Services**.
- d. Right click **CSSConfig**, select **Export for Edit**, and save the XML file on a local drive.
- e. In the XML file, change the host in the hub location line to `http://hss.epm.oracle.com:28080`.

- f. Save and close the XML file.
 - g. Repeat [step 2.b](#) and [step 2.c](#), right-click **CSSConfig**, and select **Import after Edit**.
 - h. Click **Browse** to locate the edited file on the local drive, then click **Finish**.
- 3 Using Oracle Hyperion Enterprise Performance Management System Lifecycle Management, change the Java Database Connectivity (JDBC) Uniform Resource Locator (URL) to use the DNS alias or name:**
- a. Log on to Oracle's Hyperion® Shared Services Console.
 - b. Click **Application Groups**, then **Foundation**, then **Deployment Metadata**.
 - c. Expand **Shared Services Registry**, then **Foundation Services**, then **Shared Services**, and then **Db Conn**.
 - d. Right-click **Database Connections Properties**, select **Export for Edit**, and save `DATABASE_CONN.properties` on a local drive.
 - e. Change the property value `dbJdbcUrl` in the file to `hssdb.epm.oracle.com`.
 - f. Save and close the properties file.
 - g. Repeat [step 3.b](#) and [step 3.c](#), right-click **Database Connections Properties**, and select **Import after Edit**.
 - h. Click **Browse** to locate the edited file on the local drive, then click **Finish**.
- 4 Follow [step 4](#) through [step 6](#) in the preceding procedure, for setting up disaster recovery during installation.**

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

Reporting and Analysis Clustering

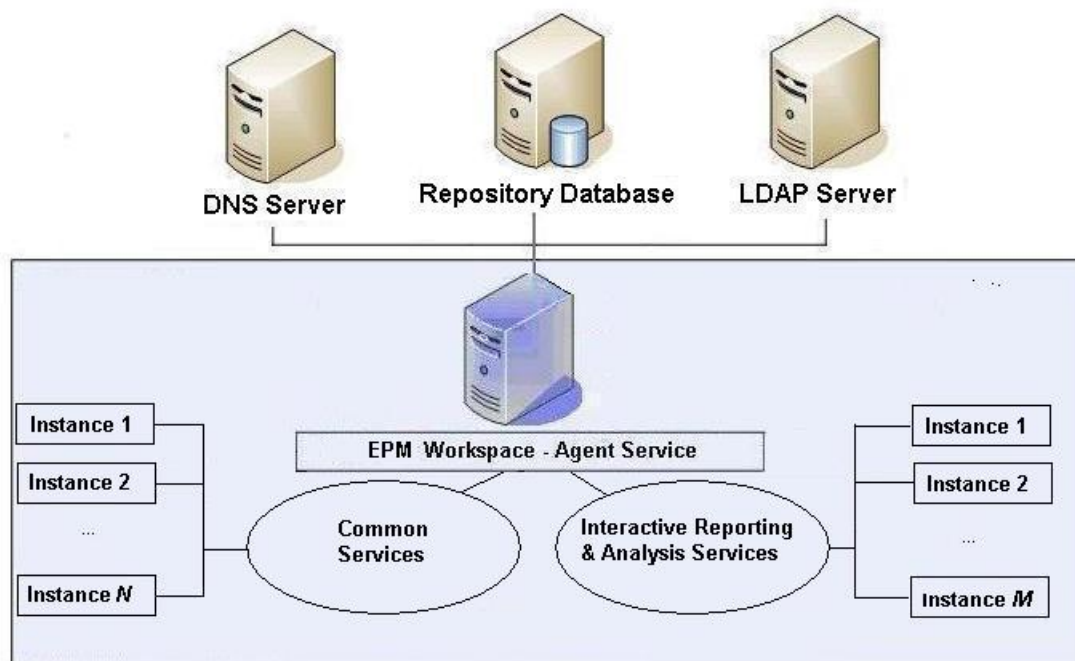
Reporting and Analysis supports two clustering models: virtual clustering through Configuration and Monitoring Console (for core services and Interactive Reporting services) and physical clustering, which involves installations on different hosts.

Core Services Clusters

You can use the Reporting and Analysis Configuration and Monitoring Console to cluster Reporting and Analysis core services when running the same services under different Java processes (Configuration and Monitoring Console service copying).

[Figure 2](#) shows Oracle's Hyperion Reporting and Analysis core services clustered for failover.

Figure 2 Reporting and Analysis Cluster



EPM Workspace and Interactive Reporting Clusters

You can set up an active-active configuration of the EPM Workspace service tier by installing Foundation EPM Workspace services on each machine.

Note: Round robin load balancing is not supported by EPM Workspace. Disable round robin load balancing to avoid encountering a process error message when working in EPM Workspace.

These EPM Workspace common services can be clustered:

- Service Broker
- SQR Job Factory
- Event Service
- Session Manager
- Authentication
- Authorization
- Analytic Bridge
- Harvester
- Transformer
- Global Service Manager (GSM)

Note: For clustered GSM, you must log on to the Configuration and Monitoring Console and manually enable the GSM service and Service Broker service for a second EPM Workspace agent configuration immediately after installation and configuration. See the “Configuring Services Using CMC” chapter of the *Oracle Enterprise Performance Management Workspace Administrator’s Guide*.

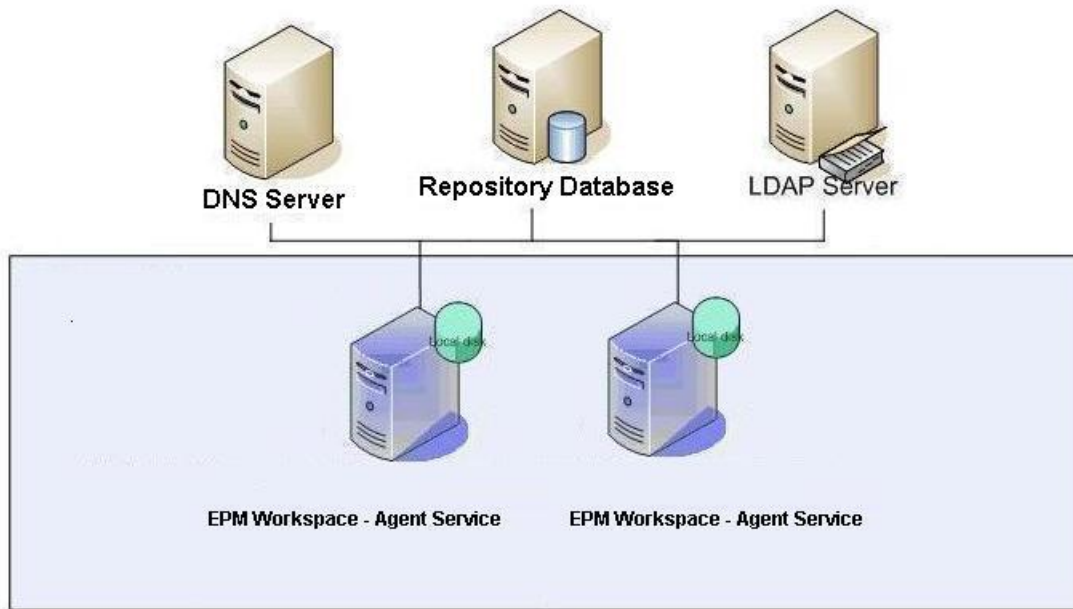
- Repository Manager (RM)

Note: There can be only one physical repository location for all RM services. EPM System Configurator sets the repository location as `HYPERION_HOME/products/Foundation/workspace/data/RM1_host` by default. Nondefault RM services are available to users with the required permissions only if the services are set to the shared physical repository location; if they are not set to that location, RM services are disabled automatically after configuration. If the physical repository is on a network share and you are on a Windows server, you must run Oracle Enterprise Performance Management Workspace, Fusion Edition agent with a user account that has access rights to this share, not with the `LocalSystem` account. See the “Configuring Services Using CMC” chapter of the *Oracle Enterprise Performance Management Workspace Administrator’s Guide*.

These Oracle's Hyperion® Interactive Reporting services can be deployed in an active-active configuration, as shown in [Figure 3](#):

- Log Service
- Intelligence Service
- Data Access Service
- Job Service

Figure 3 Interactive Reporting Services in an Active-Active Configuration



Financial Reporting Clusters

You can deploy these Financial Reporting service-tier components in an active-active configuration, with one installation on each machine:

- Report Server
- Print Server

No manual steps are required to achieve load balancing and failover for these components.

Only one active instance of the Financial Reporting Scheduler service is permitted, though multiple instances can be installed, one on each machine. To change the active instance, stop the running copy and then start the new instance.

You can also cluster the Oracle Hyperion Financial Reporting, Fusion Edition Web application and Oracle's Hyperion® Web Analysis. See the *Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide*.

3

Clustering EPM System Products with Proprietary Application Servers

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About EPM System Application Servers

See these topics for information about clustering EPM System products that have built-in proprietary application servers:

- “Data Relationship Management Clusters” on page 25
- “FDM Clusters” on page 26
- “Financial Management Clustering” on page 27

To cluster EPM System products with proprietary application servers, you must enable multiple server support. You can specify a group of application servers through which to distribute the user load. For example, you can create a group named Marketing_Servers and add the application servers Mkt1, Mkt2, Mkt3, and Mkt4 to the group. You can add servers to a group or remove servers, as needed.

Each client computer stores a list of the available servers in the local registry and randomly selects a server during logon. If the client cannot log on to the selected server, that server is removed from the local list, and the client randomly picks another server. After the client connects to a server, it asks that server for an updated list of servers and updates the local registry for the next logon request.

Data Relationship Management Clusters

Data Relationship Management uses a Web gateway to connect client requests to the processing engines. The processing engines can be distributed among several machines for scalability. The Web gateway director routes client requests through the Web gateway to different engines.

Note: The processing requests are not necessarily distributed evenly among the machines in the cluster. Routing to the processing engines is based on the data being accessed and the type of operation being performed.

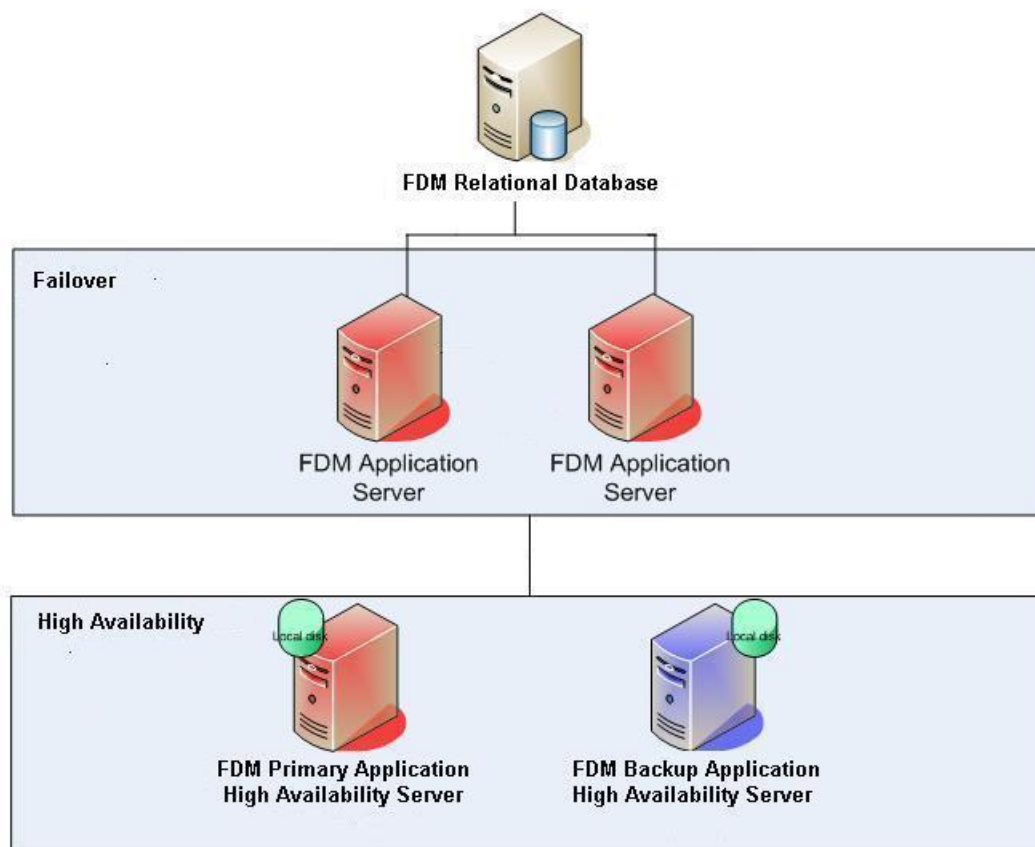
With multiple Web gateways, you can use a third-party load balancer to distribute requests to different Data Relationship Management Web gateway servers. See the *Oracle Hyperion Enterprise Performance Management System Manual Deployment Guide*.

When installing Oracle Hyperion Data Relationship Management, Fusion Edition in a clustered database environment, you must select the “Save database scripts to disk” option so that the database is created in the clustered environment and then populated when the scripts are run manually. If you do not select the option, the installer creates the data files using an explicit file path, which is incompatible with data file management methods in clustered database environments (such as Oracle Real Application Clusters).

FDM Clusters

Figure 4 shows a scenario with an FDM relational database clustered for [failover](#) and [high availability](#) on proprietary Oracle Hyperion Enterprise Performance Management System application servers. You can use third-party products to cluster Web servers to support high availability for FDM. For instructions on clustering the FDM relational database, see the documentation for the database software.

Figure 4 FDM Clustered for Failover and High Availability



Note: When you configure FDM with Financial Management, the machine profile in the Workbench must point to the Financial Management cluster that is registered on the Oracle Hyperion Financial Data Quality Management, Fusion Edition application servers. The target setting in the profile must exactly match the Financial Management registration, or they cannot communicate with each other, and you encounter an error message saying that the server or cluster is configured incorrectly.

Financial Management Clustering

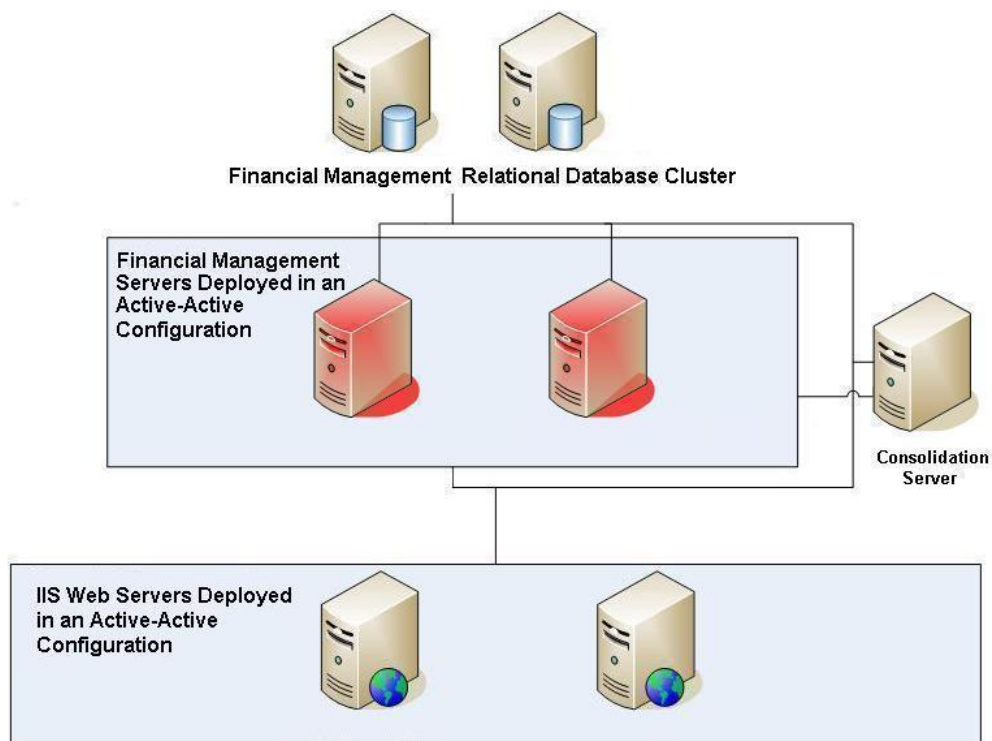
Clustering Financial Management servers for **high availability** is done with Oracle's Hyperion Enterprise Performance Management System Configurator. See the *Oracle Hyperion Enterprise Performance Management System Installation and Configuration Guide*.

A server that is not clustered, such as a dedicated consolidation server, for large perimeter consolidations, can still be used with the clustered application servers. Data for those application servers is stored in the relational database that can be made highly available.

Figure 5 shows Financial Management relational databases clustered on two Financial Management servers and two Microsoft Web servers. A Web server cluster is generally active-active and uses a hardware load balancer.

Note: Oracle Hyperion Financial Management, Fusion Edition clustering requires Microsoft IIS. See the Microsoft IIS documentation.

Figure 5 Financial Management Clustering: Web Server and Proprietary Application Server



4

Essbase Clustering

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High Availability, Failover, and Load Balancing for Essbase

Essbase clustering is an active-active configuration of identical databases that run on one or more Essbase servers. Identical databases have the same outline, data, and database objects (calculation scripts, report scripts, and so forth). Essbase clusters are created and managed through Provider Services, which supports high availability, failover, and load-balancing capabilities of Essbase databases.

Provider Services clients include Oracle Hyperion Smart View for Office, Fusion Edition 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 Essbase cluster supports read-only operations on the databases; it does not support data write-back or outline modification. An 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 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 32](#).

Essbase Clustering Options

Using Provider Services, you can create a 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.

Clustering with Provider Services

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

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

Adding Servers to an Essbase Cluster

You must specify which servers a cluster includes.

► To add servers to an Essbase cluster, from the 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 **Hyperion 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 Essbase Clusters

► To remove an Essbase cluster:

- 1 From **Enterprise View** or a custom view in the Administration Services Console, under the **Hyperion 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 Essbase Clusters

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

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

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

➤ To remove a database component from a cluster, from the 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 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 the 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 the 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**.

Essbase Clustering Examples

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

Essbase Server Clusters

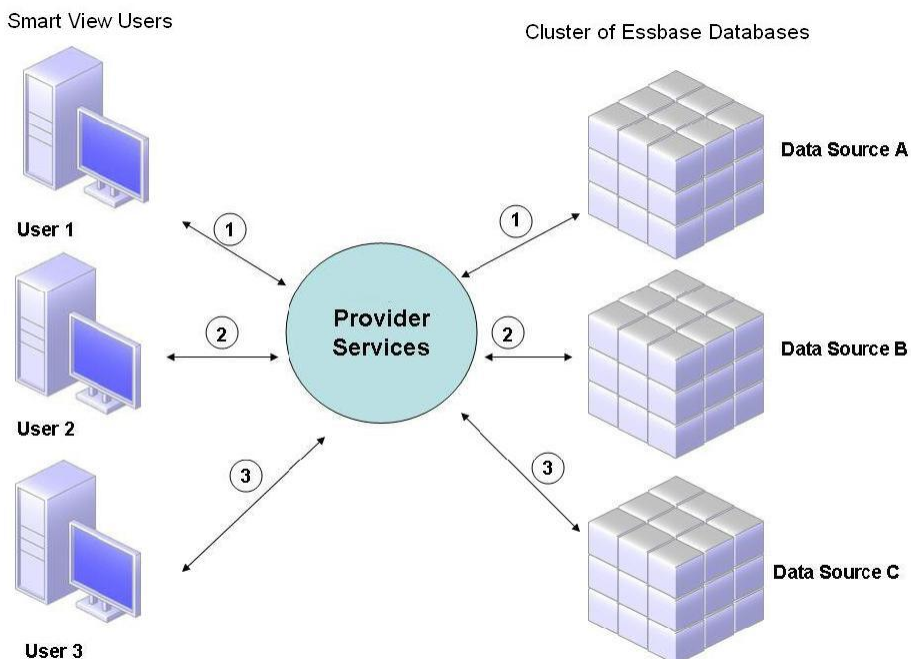
Provider Services enables you to group sets of Essbase servers running applications with identical databases and use them as one resource.

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, a series of active, duplicate databases that 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 6 Essbase Database Clustering with Provider Services



In [Figure 6](#), Oracle Hyperion Smart View for Office, Fusion Edition users are connecting to Essbase through Provider Services.

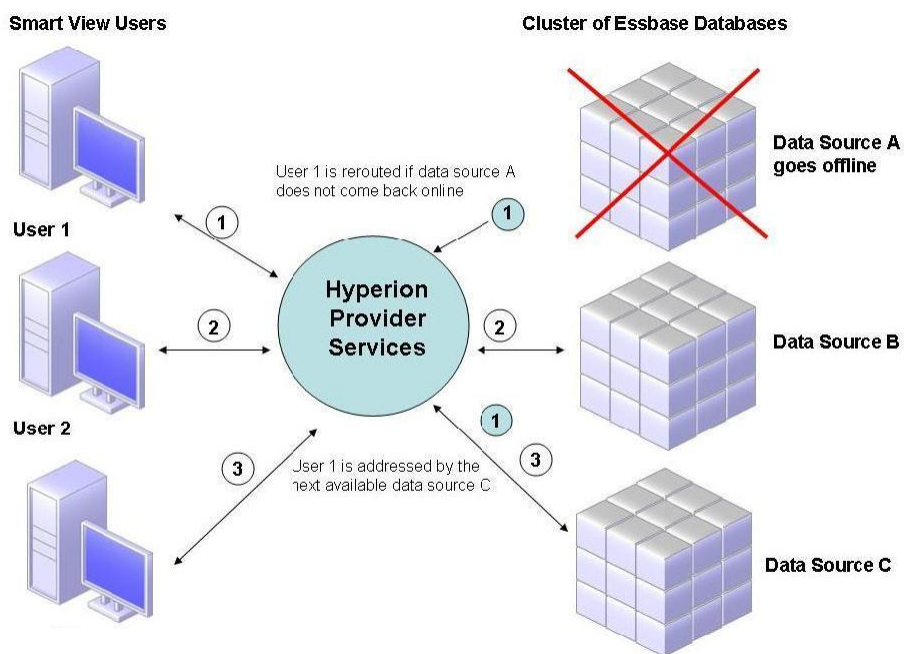
Each user connection is assigned to a server during the Essbase session. Provider Services uses session-level load balancing. For example, in [Figure 6](#), User 1's connection is mapped to Data Source A. User 2's connection is mapped to Data Source B. User 3's connection is mapped to data source C. 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 7](#).

[Figure 7](#) illustrates what happens when Data Source A goes offline.

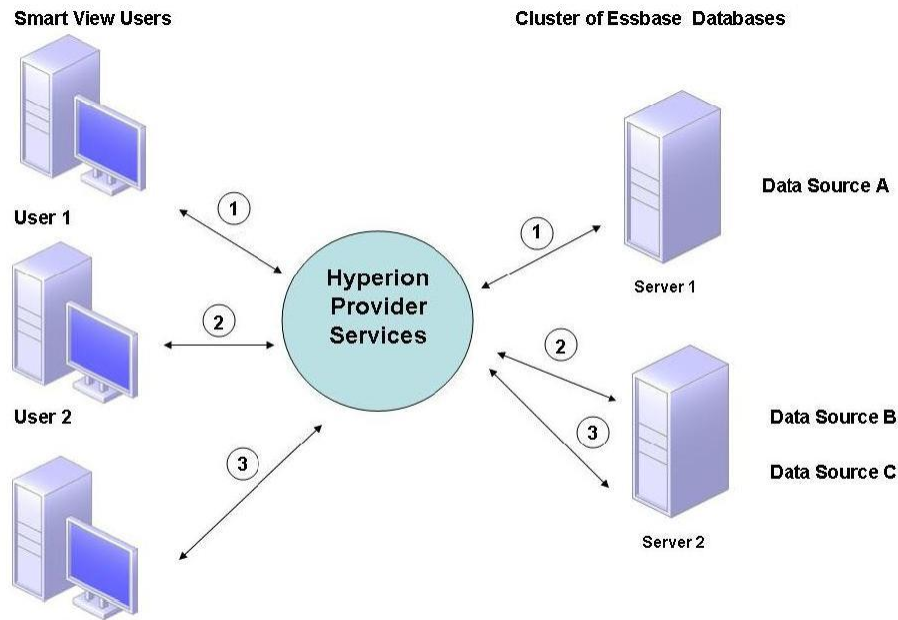
Figure 7 Database Cluster with One Data Source Offline



In [Figure 7](#), the state of query 1 is maintained at the middle tier and rerouted. Oracle Hyperion Provider Services also provides load balancing across servers.

[Figure 8](#) depicts clustered databases deployed on one server.

Figure 8 Essbase Database Cluster on One Server



In [Figure 8](#), two servers contain Oracle 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 9](#), Server 2 goes offline. User 2 and User 3 are then rerouted to the next available server, Server 1.

Figure 9 Failover for Database Cluster on One Server

