

Oracle
Primavera
Data Warehouse Installation and Configuration Guide for On-Premises

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Oracle Primavera Data Warehouse Installation and Configuration Guide for On-Premises

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Overview

Primavera Data Warehouse is a data repository that collects and stores data from the following products:

- ▶ P6 EPPM
- ▶ Primavera Unifier

It contains a process called STARETL to *extract, transform, and load* (ETL) data from the above applications into Primavera Data Warehouse.

Primavera Data Warehouse separates the data into:

- ▶ Facts
Fact tables contain business facts or measures. For example: Actual Total Cost, Workflow Duration.
- ▶ Dimensions
Dimension tables contain descriptive attributes or fields. For example: Activity Name, Cost Breakdown Structure.

As Primavera Data Warehouse schema accumulates project and cash flow data, it provides baselines for tracking trends and for advanced business intelligence. It also provides key metrics on current data, which allow you to drill through root cause analysis.

To analyze and render the data stored in Primavera Data Warehouse as report and dashboards, connect Primavera Data Warehouse to Oracle Analytics Server (OAS) using Primavera Analytics. For more details on installing OAS and Primavera Analytics, refer to the respective installation guides.

This guide describes how to install, configure, and upgrade Primavera Data Warehouse.

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About Primavera Analytics

Primavera Analytics uses the data stored in Primavera Data Warehouse to identify insights, patterns, and develop business-intelligent analyses that help organizations reach their goals and objectives successfully.

Primavera Analytics consists of the following:

- ▶ A Repository Definition file (.rpd)

The Primavera Analytics Repository Definition file contains all of the information Oracle Analytics Server needs to allow end users to create purposeful analysis based on data contained within Primavera Data Warehouse. The RPD file contains all the metadata, security rules, database connection information. It maintains the mapping of the physical tables comprising the data warehouse to the Presentation Layer, which holds the columns and tables available for use in Oracle Analytics Server.

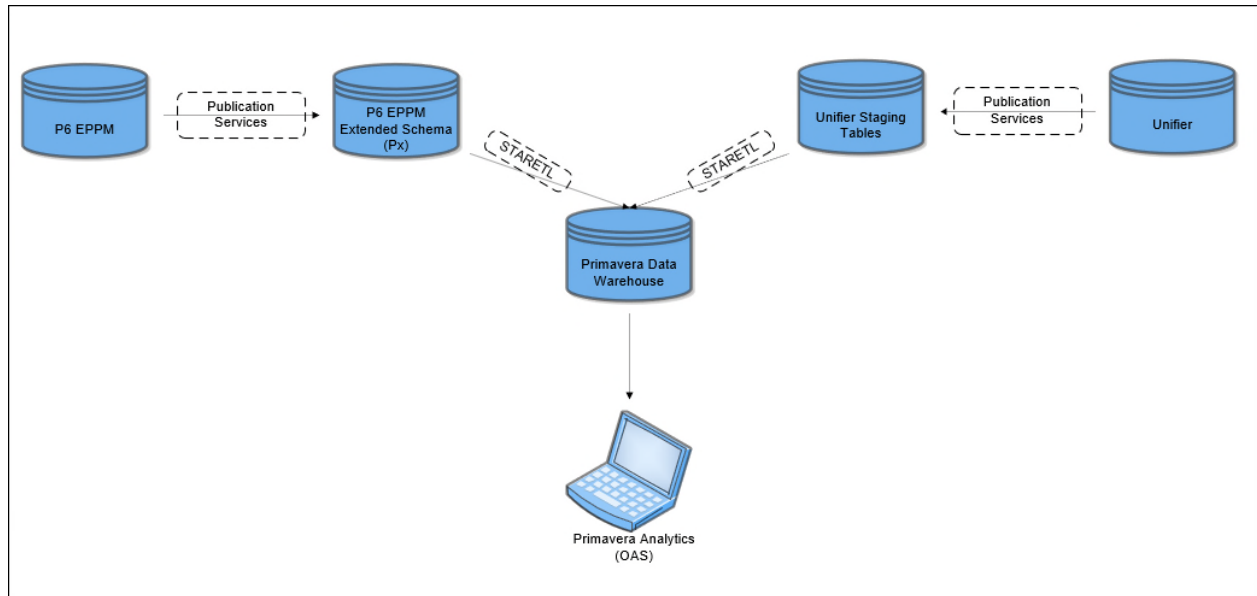
- ▶ A sample Primavera Data Warehouse

The sample Primavera Data Warehouse can be restored and connected as the back-end for the sample Primavera Analytics catalog.

Primavera Analytics is built upon the industry leading Oracle Analytics Platform. The data stored in Primavera Data Warehouse is analyzed and rendered as reports and dashboards, by connecting Primavera Data Warehouse to Oracle Analytics Server using Primavera Analytics.

Primavera Data Warehouse and Primavera Analytics Data Flow

The following diagram depicts how data flows between P6 EPPM and Primavera Unifier into Primavera Data Warehouse. Depending on your organization's specific deployment, it is possible to have one or many P6 EPPM and/or Primavera Unifier databases loading data into a single Primavera Data Warehouse. This technique of having multiple databases populating a single Primavera Data Warehouse is known as multiple data source. The diagram below shows how data flows between P6 EPPM and Primavera Unifier into Primavera Data Warehouse:



For On-Premises

Use either the PL/SQL-based or ODI-based StarETL process.

Note: The term, StarETL, is used generically, unless it is specific to PL/SQL or ODI.

In the diagram, P6 EPPM contains a set of processes, called *Publication Services*, that are designed to move, manipulate and store data in specific database views, called the *P6 EPPM Extended Schema (Px)*. These views are used as the source of data for Primavera Data Warehouse. Once the data in P6 EPPM Extended Schema is up-to-date and ready to be moved into Primavera Data Warehouse, the STARETL process is run. After the STARETL process is complete, the data in Primavera Data Warehouse is up-to-date in the current and historical fact and dimension tables.

Primavera Unifier goes through a similar process. Data in the Primavera Unifier database is published (by a set of Publication Services) to the Primavera Unifier Staging tables. Once the data in the Primavera Unifier Staging tables is up-to-date, the STARETL process is run, manually through a command line interface, through a web-based interface, or through a scheduled routine. After the STARETL process is complete, the data in Primavera Data Warehouse is up-to-date in the current and historical fact and dimension tables.

On-premises installations have two alternatives to run the STARETL process, using PL/SQL or ODI.

- ▶ A STARETL process using PL/SQL is denoted as STARETL (PL/SQL).
- ▶ A STARETL process using ODI is denoted as STARETL (ODI).

The data is now available for access through applications such as Oracle Analytics Server.

Primavera Data Warehouse Installation Roadmap

This roadmap serves as a guideline to understand where you are in the overall installation and configuration process. Each step in the roadmap refers to a specific chapter or section in this guide. For detailed instructions, review the specific chapter.

Note: Complete each step in the Primavera Data Warehouse roadmap before installing Primavera Analytics.

Use the following sequence as a roadmap to install and configure Primavera Data Warehouse:

- 1) Review the *Primavera Analytics Planning and Sizing Guide* thoroughly to determine the appropriate size and scale for your particular implementation, disk storage needs, oracle database instance setup evaluation.
- 2) Ensure you have the base environment ready for installing Primavera Data Warehouse.

Complete the following prerequisites:

- ▶ Install Java Development Kit (JDK)
- ▶ Install Oracle Database Instance
- ▶ Install Oracle Database Enterprise Edition with Partitioning if you want to use a partitioned environment
- ▶ Install Oracle Database Client
- ▶ Create Primavera Data Warehouse tablespaces
- ▶ Install WebLogic if you want to manage users and STARETL runs using the Primavera Analytics Web Administration Application
- ▶ (Optional) Install Oracle Data Integrator (ODI) if you want to run STARETLs using ODI instead of the traditional installation
- ▶ Install and configure the following applications as data sources for Primavera Data Warehouse:
 - P6 EPPM
 - Primavera Unifier
- ▶ Install Graphical Interface Display with UNIX or Linux.

For detailed instructions, see ***Primavera Data Warehouse Installation Prerequisites*** (on page 13).

- 3) Install Primavera Data Warehouse.
For detailed instructions, see ***Installing Primavera Data Warehouse*** (on page 25).
 - 4) For initial configuration of Primavera Data Warehouse use the configuration utility.
For detailed instructions, see ***Using the Primavera Data Warehouse Configuration Utility*** (on page 27).
 - 5) Run STARETLs for traditional installations. For detailed instructions, see ***Running the STARETL Process for Traditional Data Warehouse Installations*** (on page 37).
- or

- (Optional) If you installed ODI, then import ODI projects and run STARETLs from ODI. For detailed instructions, see ***Using ODI for STARETL Runs*** (on page 38).
- 6) Install and deploy Primavera Analytics Web Administration Application.
For detailed instructions, see ***Installing Primavera Analytics Web Administration Application*** (on page 41).
- 7) Use Primavera Analytics Web Administration Application to manage users and schedule STARETL runs.
For detailed instructions, see ***Using Primavera Analytics Web Administration Application*** (on page 55).
- 8) (Optional) Setup ***Additional Settings*** (on page 65).
- 9) (Optional) Setup ***Additional Configurations*** (on page 75).
- 10) (Optional) Configure additional security features. For detailed instructions, see ***Configuring Advanced Security Features*** (on page 77).

Primavera Data Warehouse Installation

Prerequisites

This section describes the prerequisites needed to install Primavera Data Warehouse. This includes:

- ▶ Database and disk storage space requirements
- ▶ Java requirements
- ▶ P6 EPPM and Primavera Unifier requirements

Before implementing Primavera Data Warehouse and Primavera Analytics, also review technical specifications and *Appendix B: Database scripts for Validations* in the *Analytics Planning and Sizing Guide for On-Premises*.

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Java Development Kit (JDK)

The Java Development Kit (JDK) is required to install, configure, and run the STARETL process. JDK must be installed first on the server where you plan to install, configure, and run the STARETL process.

See the *Tested Configurations* document for details on specific JDK versions and supported operating system configurations.

Disk Storage Space

The physical storage space required for Primavera Data Warehouse needs careful planning and consideration. Due to the nature and potential volume of data capturing (both current data and historical), physical storage space requirements can vary greatly between each installation of Primavera Data Warehouse. Before installing Primavera Data Warehouse and Primavera Analytics, Oracle recommends that you thoroughly review the *Primavera Analytics Planning and Sizing Guide* in order to determine the appropriate size and scale for your particular implementation.

Oracle Database Instance

Primavera Data Warehouse requires an Oracle Database instance.

Before installing Primavera Data Warehouse, the instance CHARACTER SET and COLLATION for Primavera Data Warehouse must match the instance CHARACTER SET and COLLATION that is set on the P6 EPPM and/or the Primavera Unifier instances.

Set up and configure an Oracle Database instance and supporting tablespaces. If the server where Primavera Data Warehouse will be installed does not have an Oracle Database instance, install and configure an Oracle Database client on the server machine where the STARETL process will run.

Oracle recommends the following:

- ▶ Primavera Data Warehouse instance reside on a different physical machine than both the P6 EPPM instance and/or the Primavera Unifier instance. This minimizes the impact that Primavera Data Warehouse has on the performance of P6 EPPM and/or Primavera Unifier instance server. Refer to the *Primavera Analytics Planning and Sizing Guide* for more information.
- ▶ Due to the volume and potential size growth of the Oracle Database instance, dedicate this instance to Primavera Data Warehouse.
- ▶ Configure this instance with database partitioning enabled.

If you choose not to enable database partitioning, certain features of Primavera Data Warehouse will not function properly including daily level activity history and multiple data source support.

Note: Do not run the Primavera Data Warehouse instance in ARCHIVELOG mode.

Creating the Primavera Data Warehouse Tablespaces

If the tablespaces do not already exist, complete the following steps to create the Primavera Data Warehouse tablespaces:

- 1) Sign in to the Oracle Database Instance as a user with Create Tablespace privileges. For example, SYS.

Note: If you are using an Oracle 19c pluggable database, use the Service Name to connect.

- 2) Create the necessary tablespace with the following statements:

```
CREATE SMALLFILE TABLESPACE STAR_DAT1 DATAFILE '<path>\<star_dat1>.dbf' SIZE 100M
AUTOEXTEND ON NEXT 100M MAXSIZE UNLIMITED LOGGING EXTENT MANAGEMENT LOCAL UNIFORM
SIZE 1M SEGMENT SPACE MANAGEMENT AUTO;
```

where <star_dat1> is the name of the star tablespace and <path> is the path to the folder where the database instance data files reside (by default, **\\oracle\oradata\database name**).

- 3) Create the necessary history tablespace with the following statements:

```
CREATE SMALLFILE TABLESPACE STAR_HST1 DATAFILE '<path>\<star_hst1>.dbf' SIZE 100M
AUTOEXTEND ON NEXT 100M MAXSIZE UNLIMITED LOGGING EXTENT MANAGEMENT LOCAL UNIFORM
SIZE 1M SEGMENT SPACE MANAGEMENT AUTO;
```

where <star_hst1> is the name of the star history tablespace and <path> is the path to the folder where the database instance data files reside (by default, **loracle\oradata\database name**).

- 4) Ensure case sensitivity for the Primavera Analytics sample database instance is set to false for database logons with the following statement:

```
alter system set sec_case_sensitive_logon=false;
```

- 5) If you are using Oracle Data Integrator (ODI), create the ODI Target User and tablespaces with following statements:

```
CREATE TABLESPACE ODI_TGT_DAT1 DATAFILE '<path>/ODI_TGT_DAT1.dbf' SIZE 10M
AUTOEXTEND ON;
CREATE TEMPORARY TABLESPACE ODI_TGT_TEMP TEMPFILE
'<path>/ODI_TGT_TEMP_DAT1.dbf' SIZE 10M AUTOEXTEND ON;
```

```
CREATE USER ODI_TGT_USER IDENTIFIED BY oracle
DEFAULT TABLESPACE ODI_TGT_DAT1
TEMPORARY TABLESPACE ODI_TGT_TEMP
QUOTA UNLIMITED ON ODI_TGT_DAT1;
```

```
GRANT CONNECT, RESOURCE, SELECT ANY TABLE TO ODI_TGT_USER;
```

where <path> is the path to the folder where the database instance data files reside.

- 6) Log out of the database instance.

At this point, the Oracle instance should be ready for installation of the Primavera Data Warehouse software.

Configuring Global Names for the Oracle Database Instance

The STARETL process creates and uses database links that do not match the global name used in the P6 EPPM and Primavera Unifier database instances. For an Oracle database, you must set the **global_names** parameter in the P6 EPPM and / or Primavera Unifier database instance to **FALSE**.

To do this, complete the following steps:

- 1) Sign in to the P6 EPPM and/or Primavera Unifier instance as a user with DBA privileges. For example, SYSTEM.
- 2) Run the following statement:

```
show parameter global_names;
```

3) If the parameter value equals TRUE, run the following statement:

```
alter system set global_names=FALSE;
```

Note: Running this statement does not require the database instance to be restarted.

Oracle Database Partitioning

Oracle Database Enterprise Edition with Partitioning is the solution for growth over time within the history tables. While Oracle recommends that you use a partitioned environment, the Primavera Data Warehouse also supports non-partitioned environments.

Note: If you are connecting multiple P6 EPPM or Primavera Unifier data sources to Primavera Data Warehouse, you must enable partitioning.

If you do not use a partitioned environment, Oracle recommends that the P6 EPPM database and/or Primavera Unifier database be a "small-sized database" as defined in the *Primavera Analytics Planning and Sizing Guide*. Partitioning helps keep performance consistent over time for each STARETL process run. This is particularly important when enabling activity or WBS-level history. Without partitioning, you should not use activity and WBS-level history gathering.

Without partitioning, the amount of time required to run the STARETL process increases over time. As the size and row count of specific Primavera Data Warehouse tables increases (w_project_history_f, w_wbs_history_f, w_activity_history_f, as well as tables ending in _HF and _HD) the need for partitioning also increases. You can monitor the run times for each STARETL process with the logs and reports located in **<PDW Install**

Folder>\star\etl_homes\staretl<id>\log. See **Accessing Primavera Data Warehouse Log Files** (on page 60) for details.

If you deploy without partitioning, the following features are not supported:

- ▶ WBS-level or activity-level history transfer to Primavera Data Warehouse
- ▶ WBS-level or assignment-level history transfer to Primavera Data Warehouse
- ▶ Multiple data sources
- ▶ Burn Down functionality
- ▶ Work Planning functionality
- ▶ Capturing dimensional history

Note: If you implement partitioning, you must license the Oracle Database partitioning option.

Oracle Database Client

Install an Oracle database client on the server where Primavera Data Warehouse software is installed and where the STARETL process will run. Full read/write privileges are required in the server directory for the user account that will be used to install and run the Primavera Data Warehouse software. This account also needs privileges to run the Oracle client files (sqlldr, sqlplus) and Java Development Kit (JDK).

Note: The STARETL process requires the Oracle component SQLLDR. SQLLDR is automatically installed with a full Oracle Client install. If you cannot install the full Oracle Client, you must install SQLLDR manually before you begin installing Primavera Data Warehouse.

With UNIX or Linux, you must manually set the ORACLE_HOME, JAVA_HOME, and PATH on the server where the STARETL will run. The PATH should be **ORACLE_HOME/bin**.

Installing ODI

Primavera Data Warehouse accumulates data over time with each run of the STARETL process. The traditional ETL process is used to run STARETLs to extract, transform, and load (ETL) data into Primavera Data Warehouse.

Primavera Analytics gives you an alternative option to run STARETLs by using Oracle Data Integrator (ODI) to extract, transform, and load (ETL) data from the following data sources into Primavera Data Warehouse:

- ▶ P6 EPPM
- ▶ Unifier

Oracle Data Integrator (ODI) is a comprehensive data integration platform that covers all data integration requirements: from high-volume, high-performance batch loads to event-driven, trickle-feed integration processes and SOA-enabled data services. ODI allows for near real-time migration of data.

ODI allows for features not supported by the traditional ETL process such as:

- ▶ Real-time analytics
- ▶ Single project loading on-demand

Note: ODI is a separately licensed application.

See the *Tested Configurations* document for the supported version of Oracle Data Integrator (ODI).

For more details on installing ODI, see the **ODI 12c (12.2.1.4.0) Installation Guide**
<https://docs.oracle.com/en/middleware/fusion-middleware/12.2.1.4/oding/index.html>.

Creating and Configuring the ODI Java EE Agent

Create and configure a WebLogic domain for the Java EE Agent. This agent is used to run Oracle Data Integrator (ODI) scenarios and load plans.

For more details on creating and configuring the Java EE Agent, see ***Configuring the Domain for a Java EE Agent***

<https://docs.oracle.com/en/middleware/fusion-middleware/12.2.1.4/oding/configuring-domain-java-ee-agent.html#GUID-3F74BFAB-99E9-4060-86E8-F70A8352A701>.

Note: When you use the instructions in the above link to configure the Java EE agent, note the following:

- As part of step 2, ensure that you select the **Oracle Data Integrator - REST Services** template during the domain creation.
 - As part of step 13, ensure that both the **JRF-MAN_SVR** and **ODI-MGD-SVRS** options are selected.
-

Increasing the Connection Pool for odiMasterRepository and odiWorkRepository

After creating and configuring the Oracle Data Integrator (ODI) Java EE Agent, modify the connection pool settings for the odiMasterRepository and odiWorkRepository as follows:

- 1) Sign in to the ODI WebLogic Administration Console:
`http://<server>:<port>/console`
where
`<server>` is the IP address of the server.
`<port>` port is the listening port (by default, 7001).
`/console` is the default context for the WebLogic Administration Console.
- 2) In the **Domain Structure** pane, expand the **Services** node and click **Data Sources**.
- 3) To modify the connection pool settings for **odiMasterRepository**:
 - a. In the **Data Sources** table, click **odiMasterRepository**.
 - b. Click the **Connection Pool** tab.
 - c. In the **Initial Capacity** field, enter *100*.
 - d. In the **Maximum Capacity** setting, enter *150*.
 - e. Click **Save**.
- 4) To modify the connection pool settings for **odiWorkRepository**:
 - a. In the **Data Sources** table, click **odiWorkRepository**.
 - b. Click the **Connection Pool** tab.
 - c. In the **Initial Capacity** field, enter *100*.
 - d. In the **Maximum Capacity** setting, enter *150*.
 - e. Click **Save**.

Note: No restart is required.

Installing P6 EPPM and Primavera Unifier

Primavera Data Warehouse relies on data from P6 EPPM and/or Primavera Unifier. One or both of these products must be installed and operational before you install the Primavera Data Warehouse. Refer to the *Tested Configurations* document for supported versions of each product.

Before installing Primavera Data Warehouse, configure and run P6 EPPM and/or Primavera Unifier Publication Services. This ensures that the data is up-to-date and ready to be extracted, transformed, and loaded (ETL) into Primavera Data Warehouse. See **Configuring and Running P6 EPPM Publication Services** (on page 19) and **Configuring and Running Primavera Unifier Publication Services** (on page 21) for details.

Configuring and Running P6 EPPM Publication Services

If you are using P6 EPPM as a data source, Primavera Data Warehouse relies on data from the P6 EPPM Extended Schema and related publication services. Configure the P6 EPPM publication services and run them successfully prior to running a STARETL process. The publication services are responsible for moving and transforming P6 EPPM data into the P6 EPPM Extended Schema.

Note: If the publication and at least one of the global scheduled services are not run prior to installing the Primavera Data Warehouse software, the STARETL configuration process will fail. See the document, *"Running configStar Results In Blank Pop-up When Clicking Finish, Preventing Configuration Utility From Completing And Logging Following Error: java.lang.NullPointerException at java.util.Calendar.setTime(Unknown Source)"* (Doc ID 1904956.1) on My Oracle Support at <http://support.oracle.com>.

There are two types of publication services within P6 EPPM that need to be run in order to ensure that the data in the P6 EPPM Extended Schema is up-to-date prior to running the STARETL process.

- ▶ **Global Scheduled Services:** Global services are responsible for moving global/enterprise level data (Users, Security, Codes, Hierarchies, and so on) from the P6 EPPM base tables into the Extended Schema. Due to the possibility that this type of global data does not change frequently, Global Services can be configured to run at regularly scheduled intervals. Global scheduled services include the following:
 - ▶ **Publish Enterprise Data Service** calculates and publishes enterprise-level business objects containing calculated and denormalized fields, including cost accounts, currencies, calendars, codes, funding sources, resource teams, role teams, timesheet dates, UDFs and more.
 - ▶ **Publish Enterprise Summaries Service** calculates and publishes EPS-level spread data for currently published projects in a given EPS.

- ▶ **Publish Resource Management Service** calculates and publishes the resource hierarchy, resources, resource rates, resource limits, role rates, resource role assignments, and resource security.
- ▶ **Publish Security Service** publishes users, the OBS, and security profiles and calculates security for the P6 Extended Schema.
- ▶ **Project Level Service:** This service updates data in the P6 EPPM Extended Schema for each project. This service can be configured to run at specific time intervals or based on a number of changes interval. This service processes projects in a queue type fashion.

See the *P6 Help* for details on Publication Services.

To configure and run Publication Services in P6 EPPM, complete the following steps:

- 1) Sign in to P6 EPPM as an administrator user.
- 2) From the **Administration** ▼ menu, select **Application Settings**.
- 3) On the **Application Settings** pane, click **Services**.
- 4) On the **Services** page, in the **Publication** section, use the following fields to set the amount and frequency of data updates in the P6 EPPM Extended Schema. For the Primavera Data Warehouse, set the following:
 - ▶ **Start Date:** Enter the start date for all time-distributed data published.
 - ▶ **Finish date is current date plus:** Enter the rolling end date for all time-distributed data published.
 - ▶ **Time distributed interval:** Enter the spread data bucket types (day or week).
- 5) Select the **Enable Publish Projects** option and adjust the remaining options in this section as needed for your data.

The projects that qualify for publication publish to the P6 EPPM Extended Schema.

Note: To verify the status of each project publication job in P6, select **Projects, EPS, Actions, View Service Status**.

- 6) When publication is complete, run P6 EPPM Global Scheduled Services:
 - a. From the **Administration** ▼ menu, select **Global Scheduled Services**.
 - b. In the following order, set the following global services to run immediately by right-clicking the service name and selecting **Run Service**.
 - Publish Enterprise Data
 - Publish Resource Management
 - Publish Security
 - Publish Enterprise Summaries

Note: After configuring and running publication services, configure Global Scheduled Services to run at regular intervals to work in conjunction with any changes to the P6 EPPM data.

- 7) If you are using Oracle Data Integrator (ODI), complete the additional steps described in **Configuring ODI Source User and Source Schema Privileges** (on page 21).

Configuring and Running Primavera Unifier Publication Services

If you are using Primavera Unifier as a data source, Primavera Data Warehouse relies on data from the Primavera Unifier Staging Tables and related publication services. You must configure and run publication services prior to running the STARETL process. This enables users to control what data to calculate and store and how often the data is updated.

Note: For detailed instructions on publishing data in Primavera Unifier, see "Publishing Unifier Data to Analytics" in the *Primavera Unifier Administration Guide*.

To configure publication services in Primavera Unifier, complete the following steps:

- 1) Sign in to Primavera Unifier with an account that has administration privileges (ootbadmin).
- 2) Go to the **Company** workspace.
- 3) Change the mode from user mode to **admin** mode.
- 4) Open the **Analytics** module.
- 5) Click the **Schedule** icon  on the toolbar.
- 6) On the **Schedule Setup** pane, set the data update frequency.
- 7) If you have made any changes to the data definition or the data mapping fields, select the **Refresh all data** check box.

Note: If you choose to refresh all data, you may want to deselect the **Refresh all data** check box after the run is complete.

- 8) Click **OK**.
- 9) If you are using Oracle Data Integrator (ODI), complete the additional steps described in *Configuring ODI Source User and Source Schema Privileges* (on page 21).

Configuring ODI Source User and Source Schema Privileges

If you are using Oracle Data Integrator (ODI), additional steps are required in the database instances where P6 EPPM or <OP_ProdName_P6_Unifier> reside.

Note: If you are not using ODI, then skip the procedures in this section.

Creating the ODI Source User

To create the Oracle Data Integrator (ODI) Source User, complete the following steps:

- 1) Sign in to the P6 EPPM or Primavera Unifier database instance with administration privileges. For example, SYSTEM.
- 2) Use the following statements to create the ODI Source User and tablespaces:

```
CREATE TABLESPACE ODI_SRC_DAT1 DATAFILE '<path>/ODI_SRC_DAT1.dbf' SIZE
10M AUTOEXTEND ON;
CREATE TEMPORARY TABLESPACE ODI_SRC_TEMP TEMPFILE
'<path>/ODI_SRC_TEMP_DAT1.dbf' SIZE 10M AUTOEXTEND ON;
```

```
CREATE USER ODI_SRC_USER IDENTIFIED BY oracle
DEFAULT TABLESPACE ODI_SRC_DAT1
TEMPORARY TABLESPACE ODI_SRC_TEMP
QUOTA UNLIMITED ON ODI_SRC_DAT1;
```

```
GRANT CONNECT, RESOURCE, SELECT ANY TABLE TO ODI_SRC_USER;
where <path> is the path to the folder where the database instance data files reside.
```

Granting Additional Rights to the P6 EPPM Extended Schema User

To use Oracle Data Integrator (ODI) with P6 EPPM, grant the required rights to the P6 EPPM Extended Schema user. For example, PXRPTUSER.

Complete the following steps:

- 1) Sign in to the P6 EPPM database instance as SYSDBA.
- 2) Use the following statements to grant additional rights to the P6 EPPM Extended Schema user:

```
GRANT ADMINISTER DATABASE TRIGGER, CREATE ANY TRIGGER, CREATE DATABASE
LINK, SELECT ANY SEQUENCE, CREATE ANY SYNONYM, DROP ANY INDEX, ALTER ANY
INDEX, CREATE ANY INDEX, DELETE ANY TABLE, UPDATE ANY TABLE, INSERT ANY
TABLE, SELECT ANY TABLE, COMMENT ANY TABLE, DROP ANY TABLE, ALTER ANY
TABLE, CREATE ANY TABLE, UNLIMITED TABLESPACE, DROP ANY VIEW, CREATE ANY
VIEW, ANALYZE ANY, CONNECT, RESOURCE TO PXRPTUSER;
```

```
GRANT SELECT ON SYS.V_$PARAMETER TO PXRPTUSER;
GRANT SELECT ON SYS.GV_$SESSION TO PXRPTUSER;
GRANT SELECT ON SYS.GV_$TRANSACTION TO PXRPTUSER;
GRANT SELECT ON SYS.GV_$LOCK TO PXRPTUSER;
```

Granting Additional Rights to the Primavera Unifier User

To use Oracle Data Integrator (ODI) with Primavera Unifier, grant the required rights to the Primavera Unifier user (for example, UNIFIER).

Complete the following steps:

- 1) Sign in to a Primavera Unifier database instance as SYSDBA.
- 2) Use the following statements to grant additional rights to the Primavera Unifier user:

```
GRANT ADMINISTER DATABASE TRIGGER, CREATE ANY TRIGGER, CREATE DATABASE  
LINK, SELECT ANY SEQUENCE, CREATE ANY SYNONYM, DROP ANY INDEX, ALTER ANY  
INDEX, CREATE ANY INDEX, DELETE ANY TABLE, UPDATE ANY TABLE, INSERT ANY  
TABLE, SELECT ANY TABLE, COMMENT ANY TABLE, DROP ANY TABLE, ALTER ANY  
TABLE, CREATE ANY TABLE, UNLIMITED TABLESPACE, DROP ANY VIEW, CREATE ANY  
VIEW, ANALYZE ANY, CONNECT, RESOURCE TO UNIFIER;  
GRANT SELECT ON SYS.V_$PARAMETER TO UNIFIER;  
GRANT SELECT ON SYS.GV_$SESSION TO UNIFIER;  
GRANT SELECT ON SYS.GV_$TRANSACTION TO UNIFIER;  
GRANT SELECT ON SYS.GV_$LOCK TO UNIFIER;
```

Graphical Interface Display with UNIX or Linux

With UNIX or Linux, a graphical interface is required to install Primavera Data Warehouse.

If you are accessing the UNIX or Linux server directly, an X Window System should be installed to facilitate input from a mouse and keyboard and graphical object display.

If you are accessing UNIX or Linux through SSH from Windows, a graphical program must be installed on your Windows workstation with X11 Forwarding passed through the terminal session to remotely run graphical programs.

Installing Primavera Data Warehouse

This chapter describes how to install Primavera Data Warehouse software.

Ensure the following tasks have been completed:

- ▶ All of the installation prerequisites have been complete.
For more details, see **Primavera Data Warehouse Installation Prerequisites** (on page 13).
- ▶ Creation of an Oracle instance and installation of all supporting Oracle connection files are complete.
- ▶ All related P6 EPPM and/or Primavera Unifier publication services have been run successfully to completion.

Note: If you are upgrading from a previous version of Primavera Data Warehouse or P6 Reporting Database, see **Upgrading to the Latest Version** (on page 83) for more details.

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Installing Primavera Data Warehouse Software

Complete the following steps to install Primavera Data Warehouse.

To install Primavera Data Warehouse:

- 1) Download and extract the contents of `PrimaveraDataWarehouse.zip`.
- 2) In the extracted contents, navigate to the `star/config` folder.
`cd <PDW>/star/config`
- 3) Change the permissions to run the configuration scripts:
`chmod775*`
- 4) Launch the script with the path to the environments jre within the used JDK.
`./dwInstaller.sh <java_home>`
or
`dwinstaller.cmd <java_home>`
- 5) In the **Primavera Analytics** dialog box:
 - a. In the **JRE Location** field, specify the JDK path.
 - b. Click the **Install** button to complete the installation.
A success message is displayed when installation is complete.
- 6) Click **Exit** to finish the installation.
- 7) Proceed to run the configuration utility.

For more details, see ***Configuring Primavera Data Warehouse*** (on page 27).

Configuring Primavera Data Warehouse

Primavera Data Warehouse software and STARETL settings can be configured using any of the following utilities. Select any one of the following methods to run for regular system maintenance consistently.

Caution: Do not use both methods for regular system maintenance such as adding additional codes. If you switch back and forth between these methods, it can cause overall Primavera Data Warehouse configuration issues, especially in a multiple data source environment.

Primavera Data Warehouse Configuration Utility

The Primavera Data Warehouse configuration utility is included as part of the Primavera Data Warehouse installation process. You must run this utility at least once after initial installation. Use this utility to set up the database connections required for connecting P6 EPPM and/or Primavera Unifier to Primavera Data Warehouse.

You can also run this utility any time after initial installation.

Primavera Analytics Web Administration Application

The Primavera Analytics Web Administration Application is a URL that can be accessed only after you have run the Primavera Data Warehouse configuration utility at least once after installation. You can choose to use this utility at any time after initial installation. However, database connections cannot be configured using the Primavera Analytics Web Administration Application.

This chapter describes how to configure the Primavera Data Warehouse software and configure settings for the STARETL process using both utilities.

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Using the Primavera Data Warehouse Configuration Utility

The Primavera Data Warehouse configuration utility will run as part of the initial Primavera Data Warehouse installation process.

Depending on whether you choose to configure P6 EPPM and/or Primavera Unifier, the screens and options in the configuration utility will be different. For example, Primavera Unifier does not use the configuration utility to configure its codes, so the **Codes** screen will not appear when you select Primavera Unifier on the **Welcome** screen. Each topic will indicate if a screen or option is specific to P6 EPPM or Primavera Unifier. Follow the instructions appropriate for your environment.

-
- **Notes:**
 - Some fields in the Primavera Data Warehouse configuration utility may contain pre-populated data. Check this data to ensure it is correct for your environment.
 - You must use Primavera Data Warehouse configuration utility at least once to set up database connection information. After that, you can use the Primavera Data Warehouse Web Administration Application to administer Primavera Data Warehouse from any location. For more details, see **Configuring Primavera Analytics Web Administration Application** (on page 45)s.
-

At any time after initial installation, you can run the configuration utility as follows:

- 1) Go to **<PDW Install Folder>\star\config**.
- 2) Launch the configuration utility:
Windows Installations: Run **configStar.cmd**
UNIX or Linux installations: Run **configStar.sh**.
- 3) On the **Welcome** screen, click **Next**.

Configuring the Primavera Data Warehouse Connection

To configure the Primavera Data Warehouse database connection in the **STAR Database Connection** screen, complete the following steps:

- 1) In the **Oracle Database Connection** section:
 - a. In the **Host Name** field, enter the server machine name or IP address where you installed the Primavera Data Warehouse instance.
 - b. In the **Port Number** field, enter or verify the port number for this instance. The default port number is 1521.
 - c. Enter the **Service Name** or **SID** for your Primavera Data Warehouse instance.
- 2) In the **Database Administrator Account (DBA)** section:
 - a. In the **Username** field, enter or verify the user name that has DBA privileges for the Primavera Data Warehouse database. The default name is SYSTEM.
 - b. In the **Password** field, enter the password for the DBA user.
- 3) In the **Create STAR user account** section:

- a. In the **Username** field, enter or verify your Primavera Data Warehouse user name. This user will own the Primavera Data Warehouse tables. This username can be any name you choose. The recommended value is STARUSER.
 - b. In the **Password** and the **Confirm Password** fields, enter a password for the Primavera Data Warehouse user.
- 4) De-select the **TDE** option if you want to disable Transparent Data Encryption (TDE) for all database tables.

Note: Transparent Data Encryption (TDE) is enabled by default.

- 5) In the **Select Custom Tablespaces** section:
- a. If you are using non-default tablespace names, select the **Use Non-Default Tablespaces** option.
 - b. Select the tablespaces you are using from the **Data Tablespace**, **History Tablespace**, and **Temporary Tablespace** lists.
- 6) Click **Next**.

The configuration utility tests that the connection information is valid by attempting to connect to the database instance. If the test connection fails, ensure you have entered all the information correctly and try again. If the test connection succeeds, the Configuration utility proceeds to the **Primavera Data Warehouse Connection** screen. See **Configuring ETL Settings** (on page 29) to continue the configuration process.

Configuring ETL Settings

To configure the STARETL process settings for the Primavera Data Warehouse database connection, complete the following steps on the **ETL Settings** screen:

Note: You can use the default values for most or all of these settings.

- 1) In the **JRE Location** field, enter or verify the path to the Java Development Kit (JDK).
 - ▶ You must have the appropriate version of JDK installed on the machine where the STARETL process will run. For information on the supported JDK versions and operating system configurations, see the *Tested Configurations* document.
 - ▶ The path must refer to a location on the local machine where you are installing the Primavera Data Warehouse Configuration Utility.
- 2) In the **Logging Location** field, enter the folder location to store the STARETL process logs.
- 3) In the **Max Java Heap Size (MB)** field, enter a value for the Java Heap Size. This value maps to the JVM `-Xmx` setting in the Java Runtime Environment. The default value (and recommended value) is 1,024 MB.
 - ▶ The minimum value is 512 MB.
 - ▶ When changing the Maximum Java Heap Size setting, the values must be in increments of 512 MB.
- 4) In the **General Thread Count** field, choose the number of threads the STARETL process will run concurrently. The STARETL extraction and load processes are multi-threaded. Oracle recommends keeping the default (5) for this setting.

- 5) In the **Index Building Thread Count** field, choose the number of threads to run concurrently for building the Primavera Data Warehouse schema indexes.

Oracle recommends keeping the default (5) for this setting.

- 6) In the **Partitioning** section:

Database partitioning is a powerful functionality that allows tables, indexes, and index-organized tables to be subdivided into smaller pieces, enabling these database objects to be managed and accessed at a finer level of granularity.

- a. Select the **Enable Partitioning** option to use partitioning.

Notes:

- While Oracle recommends a partitioned environment, Primavera Data Warehouse also supports non-partitioned environments with Oracle Database Standard Edition or Enterprise Edition. If you choose not to enable partitioning, Oracle recommends that you NOT use activity or WBS level history gathering. Furthermore, by not enabling partitioning, you are unable to have multiple P6 EPPM and/or Primavera Unifier instances (multiple data sources) as the source of data for a single Primavera Data Warehouse instance. For more information on database requirements and partitioning, see the *Primavera Analytics Planning and Sizing Guide*.
- The use of Oracle Database partitioning requires an additional license. Please contact your Oracle account representative to ensure that proper licensing is in place prior to implementing partitioning.

- b. In the **Datasource ID** field, enter the number of data sources that you will use in the Primavera Data Warehouse environment.

Data sources refer to the database(s) (P6 EPPM and/or Primavera Unifier) that will be used as the source of data for Primavera Data Warehouse. The maximum value for this setting is 99. Set this value to your anticipated number of data sources, since once this value is set it is difficult to increase in the future. However, it is not recommended that set this value to 99, if you do not anticipate having 99 unique data sources, as this can negatively impact performance and configuration in the future. The default value is 10. This means that you can have up to 10 data sources (P6 EPPM and/or Primavera Unifier) by default.

Note: Oracle recommends changing this setting to at least 10, which is the lowest recommended value.

- c. In the **Months per Partition** field, enter the number of months for which data will be accumulated in a single partition before a new partition is used.

For example, if the Months per Partition value is 3, data will accumulate in a single Primavera Data Warehouse partition for three months before the next partition is used. Having a smaller value in this setting means you will have more partitions, but data access and STARETL performance will be faster. The default value is 1. Oracle recommends the default value for a fast growing history partition.

- 7) In the **Action Links** section:

- a. In the **P6 URL** field, enter the URL of the P6 application in the format: *http://<host name:port>/p6*
- b. In the **UNIFIER URL** field, enter the URL of the Unifier application in the format: *http://<host name:port>/unifier*
- 8) Select the **Clean ODI Workschemas** check box to cleanup any data in ODI work schemas
- 9) Click **Next**.

Configuring Admin App Settings

If you choose to set up email configuration for the Primavera Analytics application administrator, complete the following steps on the **Admin App Settings** screen. Otherwise, click **SKIP**.

- 1) Secure Socket Layer (SSL) is enabled by default during initial installation. If you want to disable SSL for all database tables, de-select the **SSL** option.
- 2) In the **E-mail Account Info** section:
 - a. In the **(SMTP) Server Host** field, enter the host name of the SMTP server.
 - b. In the **(SMTP) Server Port** field, enter the port number of the SMTP server.
 - c. Select a **Security Protocol** from the list. Choices include, **SSL/TLS**, **START/TLS**, or **None**.
 - d. In the **Mail from Address** field, enter the outgoing e-mail address.
 - e. Select the **SMTP Authentication Required** option if you choose to enable it
 - f. In the **Authorized User** field, enter the user name of the Primavera Analytics application administrator.
 - g. In the **Authorized User Password** field, enter the password of the administrator user.
 - h. In the **Mail Prefix** field, enter a prefix to identify messages sent from the SMTP server. For example, *ANALYTICS*.
- 3) Click **Next**.

If you are using Oracle Data Integrator (ODI), see **(Optional) Configuring ODI Settings** (on page 31). Otherwise, see **Configuring OAS Cache Settings** (on page 32) to continue the configuration process.

(Optional) Configuring ODI Settings

If you are using Oracle Data Integrator (ODI), complete the following steps to configure the ODI repository:

Note: If you are not using ODI, skip this procedure and see **Configuring Multiple Data Sources** (on page 33) to continue the configuration process.

- 1) In the **ODI Master Repository** section:
 - a. In the **Master Repository URL** field, enter the full JDBC connection string to the database instance containing the ODI Master Repository schema.
 - b. In the **Username** field, enter the ODI Master Repository schema name (for example, *DEV_ODI_REPO*).

- c. In the **Password** field, enter the ODI Master Repository schema password.
 - d. In the **ODI Login Username** field, enter the supervisor name for the ODI Master Repository (for example, SUPERVISOR).
 - e. In the **ODI Login Password** field, enter the supervisor password for the ODI Master Repository.
- 2) In the **ODI Target Work Schema** section:
- a. In the **Username** field, enter the name to be used for the ODI Target Work Schema.
 - b. In the **Password** field, enter the password for the ODI Target Work Schema user.
 - c. In the **Confirm Password** field, re-enter the password for the ODI Target Work Schema user.
- 3) In the **ODI Settings** section:
- a. In the **Work Repository** field, enter the name of the ODI Work Repository (for example, WORKREP).
 - b. In the **ODI Agent URL** field, enter the full URL to the ODI Java EE Agent, and click **Test** to check connectivity is established.
 - c. In the **Oracle Middleware Home** field, click **Browse**, and navigate to the Oracle Middleware Home folder.
 - d. In the **Keep Log History (days)** field, enter the number of days of history to be kept.
- 4) Click **Next**.
- See **Configuring OAS Cache Settings** (on page 32) to continue the configuration process.

Configuring OAS Cache Settings

If you choose to purge the OAS cache after every ETL run, complete the following steps in the **Purge OAS Cache Settings** screen:

- 1) Select the **Purge OAS Cache** option to enable purging the OAS cache.
- 2) In the **OAS Target Schema** field, enter the OAS schema name.
- 3) In the **OAS Target URL** field, enter the URL of the OAS environment.
- 4) In the **OAS Target Username** field, enter the OAS user name.
- 5) In the **OAS Target Password** field, enter the password of the OAS user.
- 6) Click **Next**.

See **Creating the Data Warehouse** (on page 32) to continue the configuration process.

Creating the Data Warehouse

To create the data warehouse schema and database objects, complete the following steps:

- 1) Click **Create**.
- 2) When the message "Data Warehouse creation completed." displays, click **Exit**.

The Configuration Utility proceeds to the next step. See **Configuring Multiple Data Sources** (on page 33) to continue the configuration process.

Configuring Multiple Data Sources

Primavera Data Warehouse supports data being loaded from multiple P6 EPPM databases and/or Primavera Unifier databases. Using multiple data sources enables you to do the following:

- ▶ Group matching data (for example, Resources, Codes, and other common attributes) from different data sources into the same Primavera Data Warehouse instance.
- ▶ Combine data from P6 EPPM with data from Primavera Unifier for true cross-product analysis.

Each multiple data source table in Primavera Data Warehouse has a `datasource_id` field, which is used to identify the data source.

Notes:

- See the *Primavera Analytics Planning and Sizing Guide* for information on managing multiple data sources.
- Before adding any additional data sources, ensure that all P6 EPPM and/or Primavera Unifier Publication Services have been run on each data source. See **Configuring and Running P6 EPPM Publication Services** (on page 19) and **Configuring and Running Primavera Unifier Publication Services** (on page 21) for details.
- Oracle Database partitioning must be enabled on the Primavera Data Warehouse instance. This requires additional Oracle database licensing. Contact with your Oracle Sales Representative for details on enabling Oracle Database partitioning.

Creating Additional Partitions for Additional Data Sources

If you want to create additional data sources (beyond the default number of data sources):

- 1) Download Primavera Data Warehouse from the Oracle edelivery website.
- 2) Extract the zip in the downloaded location.
- 3) Go to the `P_R2412_DW\documentation\PartitioningScripts` folder and run the following scripts:
 - ▶ `PartitionSubPartitions.sql`
 - ▶ `SubPartitionTemplates.sql`

Verifying Database Partitioning

To verify that Oracle Database partitioning is enabled on the P6 EPPM instance, complete the following steps:

- 1) Sign in to the Primavera Data Warehouse instance with administrator privileges. For example, SYSTEM.
- 2) Run the following command to validate partitioning is running for this instance:


```
select * from V$OPTION
```
- 3) In the query results, verify that the **Partitioning** parameter is set to *True*.

Configuring Multiple Data Sources

To configure one or more data sources for Primavera Data Warehouse, complete the following steps:

- 1) Go to <PDW Install Folder>\star\config.
- 2) To launch the Primavera Data Warehouse Configuration Utility:
 - ▶ Run `configStar.cmd` (with Windows) or
 - ▶ Run `configStar.sh` (with UNIX or Linux).
- 3) On the **Welcome** screen, click **Next**.
- 4) On the **DW Reporting Configuration** screen, click **ETL Management**.
- 5) Click **Add** to add and manage data sources.
- 6) Select any of the following products to use as the data source:
 - ▶ **Primavera P6 EPPM**
 - ▶ **Primavera Unifier**
- 7) In the **Custom Name** field, enter a name to distinguish this data source.
- 8) Click **Next**.

The configuration utility proceeds to the next step. See *Configuring P6 EPPM and/or Primavera Unifier Database Connection for an Oracle Database* (on page 34) to continue the configuration process.

Repeat as need for each required data source.

Configuring P6 EPPM and/or Primavera Unifier Database Connection for an Oracle Database

To configure a P6 EPPM and/or Primavera Unifier database connection for an Oracle database:

- 1) Enter the following database information for your environment:
 - a. In the **Oracle Database Connection** section:
 1. In the **Host Name** field, enter the server machine name or IP address where you installed the P6 EPPM or Primavera Unifier database.
 2. In the **Port Number** field, enter or verify the port number for this database. The default port number for Oracle is 1521.
 3. Enter the **Service Name** or **SID** for your P6 EPPM or Primavera Unifier instance. For example, **dg4msql**.
 - b. In the **Database Credentials** section:
 1. In the **Username** field, enter your P6 EPPM reporting database name (for example, PXRPTUSER) or your Primavera Unifier database name (for example, Unifier).
 2. In the **Password** field, enter the password for the user.
 - c. If you are using Oracle Data Integrator (ODI), in the **ODI Source Work Schema** section:
 1. In the **Username** field, enter the name used for the ODI Source Work Schema.
- 2) Click **Next** to test the database connection and user credentials entered above.

If the test connection fails, ensure that you have entered all the information correctly and try again. If the test connection succeeds, the Configuration utility proceeds to the next screen.

If you are configuring a data source for P6 EPPM, see **Configuring P6 EPPM Codes for Primavera Data Warehouse** (on page 35) to continue the configuration process. If you are configuring a data source for Primavera Unifier, see **Finishing the Configuration Utility** (on page 37) to continue the configuration process.

Configuring P6 EPPM Codes for Primavera Data Warehouse

Project, Activity, and Resource codes can be extracted from P6 EPPM and loaded into Primavera Data Warehouse.

To configure P6 EPPM codes for Primavera Data Warehouse:

- 1) In the **Codes** screen, select a code as follows:
 - a. In the **Available** list box, select the code you want to extract.
The list of available codes will be populated based on the P6 EPPM database connection that you set up in the previous screen for an Oracle database.
 - b. Click the > right-arrow button to move the code to the **Selected** list box on the right.
If this is the first time that you are running the configuration utility, the **Selected** list box is initially empty.
- 2) To deselect codes:
 - a. In the **Selected** list box, select the code you want to remove.
 - b. Click the < left-arrow button to move the code to the **Available** list box on the left.
- 3) Repeat the above steps for each code you want to extract or remove to finalize the list of codes.
Primavera Data Warehouse has a limit of 240 codes for each supported type (Project, Activity, and Resource).
- 4) Click **Next** after selecting all the required codes.
See **Configuring P6 EPPM User-Defined Fields for Primavera Data Warehouse** (on page 36) to continue the configuration process.

Additional Information on Codes

- ▶ The **Selected** list box contains two additional columns:
 - ▶ The **Scope** column determines the activity code to use if the same activity code name is mapped at different levels (Global, EPS, and Project). For example, if you have a global activity code called MyCode, and a project activity code called MyCode, the scope setting would determine which activity code value to use.
 - ▶ The **ID** column determines the placement of the selected code type (Project, Activity and Resource) within the Primavera Data Warehouse code table.
- ▶ Where applicable, all codes configured in the configuration utility are available as hierarchies in Primavera Data Warehouse. Full path values or specific node level values are available for each code. Code Hierarchies apply to Project, Activity (Global only), and Resource codes. Hierarchies do not apply to Activity codes in Project or EPS codes. There are no additional configuration steps required to use code hierarchies.
- ▶ Secure codes are not currently supported by Primavera Data Warehouse.
- ▶ If you need to add additional codes, you can run the configuration utility at any time.

- ▶ Primavera Analytics imposes an upper limit of 220 UDFs for type (Text, Date, Integer, Cost) and subject area (Activity, Project, Resource, Resource Assignment, WBS), with the exception of Indicator type UDFs, which have a limit of 40. Codes are limited to 240 for each subject area (Activity, Project, Resource). If you need to exceed these limits, you must configure the .rpd file accordingly. For details, see https://blogs.oracle.com/P6Analytics/entry/how_to_add_more_than.

Configuring P6 EPPM User-Defined Fields for Primavera Data Warehouse

Use the **User-Defined Fields** screen to choose the available Project, WBS, Activity, Resource, and Resource Assignment user-defined fields (UDFs) to be extracted from P6 EPPM and loaded into Primavera Data Warehouse. Primavera Data Warehouse supports the following user-defined fields data types:

- ▶ Cost
- ▶ Numeric
- ▶ Integer
- ▶ Date
- ▶ Text
- ▶ Indicator

Notes:

- Numeric and Integer data type UDFs are displayed in the 'Non-Cost' folders in the Configuration Utility.
 - Formula Driven UDF values are not brought over during the STARETL process. The calculated UDFs can be selected as columns but the values will be null in the Primavera Data Warehouse database.
 - Primavera Data Warehouse has a limit of 220 UDFs for each supported level (Project, WBS, Activity, Resource, and Resource Assignment) and data type (Cost, Non-Cost, Date, and Text). The limit for indicator-type UDFs for each level is 40. For example, you can select a total of 220 Text UDFs that includes Project Text UDFs, WBS Text UDFs, Activity Text UDFs.
-

On the **User-Defined Fields** screen, the Available list box (on the left) shows the available Project, WBS, Activity, Resource, and Resource Assignment UDFs that can be extracted from P6 EPPM and loaded into Primavera Data Warehouse. The **Selected** list box (on the right) shows the list of selected Project, WBS, Activity, Resource, and Resource Assignment UDFs that have been selected to be extracted from P6 EPPM and loaded into Primavera Data Warehouse. If this is your first time running the Configuration Utility, the **Selected** list box is empty.

To configure P6 EPPM UDFs for Primavera Data Warehouse, complete the following steps:

- 1) In the **Available** list box, select the UDFs you want to extract.
- 2) Click the > button (located between the two list boxes).
- 3) Repeat these steps for each UDF you want to extract.

- 4) Once you have selected all the required UDFs, click **Next**.

The Configuration Utility proceeds to the next step. See ***Finishing the Configuration Utility*** (on page 37) to continue the configuration process.

Addition Information on UDFs

- ▶ To deselect a UDF, select the UDF in the **Selected** list box and click the < button.
- ▶ The **Selected** list box contains an additional column. The **ID** column determines the placement of the selected UDF level (Project, WBS, Activity, Resource, and Resource Assignment) and data type (Cost, Non-Cost, Date, and Text) within the Primavera Data Warehouse UDF table.
- ▶ If you need to add additional UDFs, you can run the Configuration Utility at any time.
- ▶ Primavera Analytics imposes an upper limit of 100 UDFs for each type (Text, Date, Integer, Cost) and subject area (Activity, Project, Resource, Resource Assignment, WBS), with the exception of Indicator type UDFs, which have a limit of 20. Codes are limited to 200 for each subject area (Activity, Project, Resource). If you need to exceed these limits, you must configure the .rpd file accordingly. For details, see https://blogs.oracle.com/P6Analytics/entry/how_to_add_more_than.

Finishing the Configuration Utility

The final screen of the Primavera Data Warehouse configuration utility is the **Completed** screen.

To complete the configuration:

- 1) Run the Primavera Data Warehouse diagnostic utility.
The diagnostic utility validates your configuration and helps troubleshoot any problems that may exist prior to running the STARETL process. This task confirms Primavera Data Warehouse is ready to have data loaded into it with the STARETL process.
- 2) In the **Datasource Configuration** screen, click **Finish** to complete the Primavera Data Warehouse software installation process.
See ***Additional Settings*** (on page 65) for details on options and settings for Primavera Data Warehouse and any configured data sources are stored in the Primavera Data Warehouse schema.
- 3) In the **Primavera Datawarehouse Configuration** screen, click **Exit**.
- 4) Run the STARETL Process:
 - ▶ If you are using the traditional ETL method, see ***Running the STARETL Process for Traditional Data Warehouse Installations*** (on page 37) for details.
 - ▶ If you are using the ODI ETL method, see ***Using ODI for STARETL Runs*** (on page 38).

Running the STARETL Process for Traditional Data Warehouse Installations

The STARETL process extracts, transforms, and loads (ETL) data. If you are using the traditional installation of Data Warehouse, run the STARETL process as follows:

- 1) Go to <PDW Install Folder>\starletl_homes\staretl<id>.
- 2) Run **staretl.bat** (with Windows) or **staretl.sh** (with UNIX or Linux).

Note: The time required for the STARETL process depends on the amount of data that has changed since the previous STARETL process was run.

Using ODI for STARETL Runs

If you are using Oracle Data Integrator (ODI), you must first import the ODI project into your ODI repository. The import process starts the load plans required to support real-time analytics. If you are using multiple data sources with ODI, there is an additional script that needs to be run for each data source. This adds each source into the ODI project, as well as run the real-time load plans for that data source.

The following is a full list of load plans in the Primavera Analytics ODI project:

- ▶ **LOAD_PLAN_INITIAL_LOAD:** Initial ETL run, performs a full load of all projects, including those opted in for real-time.
- ▶ **LOAD_PLAN_DAILY:** Daily ETL run, performs an incremental update of all scheduled projects.
- ▶ **LOAD_PLAN_REALTIME_PROJECT:** Real-time update for project related tables for those projects opted in for real-time.
- ▶ **LOAD_PLAN_REALTIME_GLOBAL:** Real-time update for global tables, this scenario runs in a loop.
- ▶ **LOAD_PLAN_ON_DEMAND:** A loop that detects any project switched to ETL (either real-time or scheduled).
- ▶ **LOAD_PLAN_LOAD_SINGLE_PROJECT:** Load single project (full) from source to STAR database.
- ▶ **LOAD_PLAN_START_JOURNAL:** Starts the journal for the data source.
- ▶ **LOAD_PLAN_STOP_JOURNAL:** Stops the journal for the data source.

Importing the ODI Project

After running the configuration utility to create the data warehouse, and configuring an ETL home directory, complete the following steps to import the Data Warehouse Project into ODI

- 1) If you created an agent in ODI using the name "OracleDIAgent", delete the agent before running the initial ETL process (in Step 2) as outlined below. This will prevent the odilimport step from failing with the message, *ODI-17591: Name "OracleDIAgent" is already used*, and allow the Data Warehouse project to import successfully:
 - a. Browse to the **<ODI Home>\studio** folder.
 - b. Run **odi.exe** (with Windows) or **odi.sh** (with UNIX or Linux) to launch the ODI studio.
 - c. Select the **Topology** tab.
 - d. Select **Connect to Repository...**

- e. When prompted, enter the walled password you created to get access to your studio login credentials.
 - f. Select the Oracle Data Integrator login you created, and connect with the **SUPERVISOR** user.
 - g. Under **Physical Architecture**, expand **Agents**.
 - h. Right-click **OracleDIAgent** and select **Delete**.
 - i. Select **Save**.
 - j. Close the ODI Studio.
- 2) Now run the STARETL process as follows:
- a. Browse to the **<PDW Install Folder>\star\config\odi** folder.
 - b. To import the project and add initial data sources which were configured, run **odiSetup.cmd** (with Windows) or **odiSetup.sh** (with UNIX or Linux).
 - or
 - c. If you want to manually run the STARETL process for each data source:
 - a. Run **odiImport.cmd** (with Windows) or **odiImport.sh** (with UNIX or Linux).
 - b. Browse to the **<PDW Install Folder>\star\etl_homes\<datasource_name>** folder.
 - c. Run **odiAddDS.cmd** (with Windows) or **odiAddDS.sh** (with UNIX or Linux).

Note: The time required for the ODI Import process depends on the amount of data brought over during the initial load.

Adding Data Sources with ODI

The time required for the ODI add data source process depends on the amount of data brought over during the initial load.

To add any additional data sources into the Oracle Data Integrator (ODI) project:

- 1) Go to **<PDW Install Folder>\star\etl_homes\staretl<id>**.
- 2) Run **odiAddDS.bat** (with Windows) or **odiAddDS.sh** (with UNIX or Linux).

Removing the ODI Project

To remove the Primavera Analytics project from Oracle Data Integrator (ODI):

- 1) Browse to the **<PDW Install Folder>\star\config\odi** folder.
- 2) Run **removeOdiObjects.cmd** (with Windows) or **removeOdiObjects.sh** (with UNIX or Linux).
- 3)

Enabling P6 EPPM Projects for Real-Time Analytics

Oracle Data Integrator (ODI) provides support for real-time analytics, which enables project changes to be immediately sent over to the Primavera Data Warehouse instead of waiting for the next scheduled ETL. Once a project is selected for real-time analytics, it is no longer part of the scheduled ETL.

Note: Primavera Unifier projects cannot be enabled for real-time analytics.

To enable a P6 EPPM project for real-time analytics, complete the following steps:

- 1) Sign in to P6 EPPM.
- 2) Click the **Projects** tab.
- 3) Click the **EPS** page.
- 4) Locate the project you want to enable for real-time analytics.
- 5) Click the gear icon  to expand the menu, and select **Set Project Preferences**.
- 6) In the **Project Preferences** window, click the **Analytics & Services** tab.
- 7) In the **Analytics** section, expand the **Data Warehouse Update Frequency (ODI Only)** drop-down menu and change the setting to **Immediate**.
- 8) Click **OK** to save the project preferences.

Repeat these steps as needed to enable for real-time analytics for other P6 EPPM projects.

Initiating A Full ETL From ODI Studio

When using Oracle Data Integrator (ODI) for Data Warehouse to initiate a full ETL (initial_load) run within ODI studio, there are a few different ways data is updated for Primavera Analytics using ODI as your ETL engine:

- ▶ **Initial Load:** Run this the first time you are setup using ODI and does a 'Full' ETL similar to the traditional ETL process which did truncates and inserts. This is not an incremental process. If there are issues during your normal day to day operations where changes may have been missed during a daily ETL due to database issues or issues with source systems you can run initial load again to catch the data up and make sure all changes have been captured.

You can also trigger the initial load by clicking **Run Initial Load** on the **ETL Status** page of the Primavera Administration application.

Note: This process should be used sparingly and not a regular process as this can interfere with other Real Time Load Plans that could be running. It is recommended to stop the other Real Time Load Plans before running Initial Load and then restart them once completed if Initial Load being run during regular operational hours where changes from source system could be detected.

- ▶ **Daily ETL:** The daily ETL does an incremental processing of changes into the data warehouse. It is similar to Initial Load covering similar data areas.
- ▶ **Real Time Load Plans** (for P6 only): This includes
 - ▶ Real Time Global: Handles global P6 data such as resources, roles, users, etc. (like dictionary level data). This is generally triggered by running P6 Global services like Resource management, Enterprise data, or security.
 - ▶ Real Time Project: Handles projects in P6 tagged for 'Immediate' updates. If no projects are tagged as such this Load Plan will remain idle.
 - ▶ Real Time OnDemand: Handles when new projects are added to the system for publication or for Analytics. Triggered by enabling publication for projects in P6.

Running the Initial Load from ODI Studio

If you need to run the Initial Load it should be done so from ODI Studio:

- 1) Go to the **Designer** tab, and expand **Load Plans and Scenarios**.
- 2) Expand **Primavera Analytics <Version Number>**.
- 3) Find **LOAD_PLAN_INITIAL_LOAD**, right click on it and choose **Run**.
- 4) Choose the data source to run it with and click **OK**.
- 5) You can view the job running in the **Operator** tab.

Daily ODI ETL

Any projects not enabled for real-time analytics are handled by the daily load plan. This load plan is run when the ETL process is run via the Primavera Analytics Web Administration Application. For more details, see **Configuring Primavera Analytics Web Administration Application** (on page 45).

Installing Primavera Analytics Web Administration Application

After completing the initial configuration, you can install Primavera Analytics Web Administration Application if you plan to use the Primavera Analytics Web Administration Application regularly.

To install Primavera Analytics Web Administration Application:

- 1) Use the Primavera Data Warehouse configuration utility included in your media pack to initially set up of your environment.

For more details, see ***Using the Primavera Data Warehouse Configuration Utility*** (on page 27).

2) Install WebLogic.

See the *Tested Configurations* document for supported versions of WebLogic.

3) Deploy Primavera Analytics Administration Application in WebLogic.

For more details, see ***Deploying Primavera Analytics Administration Application in WebLogic*** (on page 43).

Note: If you are deploying the Primavera Analytics Web Administration Application, you only need to use the Primavera Data Warehouse configuration utility to initially set up your environment. Using both, the Primavera Data Warehouse configuration utility and the Primavera Analytics Administration Application is not recommended as it will cause conflicts with STARETL process jobs, options, codes, and UDFs. It is recommended that if you deploy and use the Primavera Analytics Web Administration Application, that you continue to use it exclusively.

WebLogic Embedded Security

The Primavera Analytics Administration Application leverages the existing WebLogic embedded security model. It supports all of the various security implementations that a traditional WebLogic server supports. The following are some of the common security methods and the requirements for the web-based Configuration Utility:

To allow users to access the Primavera Analytics Administration Application, create a group in the WebLogic Authenticator provider called **p6rdbusers** and assign each user that requires access to the Primavera Analytics Administration Application to this group.

For more information on configuring the WebLogic Authenticator Provider, see https://docs.oracle.com/en/middleware/standalone/weblogic-server/14.1.1.0/secmg/default_atn.html

LDAP Providers

WebLogic supports a variety of LDAP providers. See the documentation from your LDAP provider for details on adding users and groups to the store. The only requirement for the Primavera Analytics Administration Application is that you create a group in the LDAP store called **p6rdbusers** and assign each user that requires access to the Primavera Analytics Administration Application to this group. The Primavera Analytics Administration Application has been certified with Oracle Internet Directory (OID) Authentication provider.

For more information on WebLogic LDAP providers and how to configure the server, see https://docs.oracle.com/en/middleware/standalone/weblogic-server/14.1.1.0/secmg/ldap_atn.html#GUID-C1478BFB-A1FF-46F0-8931-627A00B7945A

Identity Assertion Providers (Single Sign-on)

WebLogic supports configuration of a Single Sign-On (SSO) provider. To allow users to access the Primavera Analytics Administration Application using SSO, create a group in the LDAP directory store called **p6rdbusers** and assign each user that requires access to the Primavera Analytics Administration Application to this group. For details on adding users and groups to the directory store, see SSO documentation.

Primavera Analytics has been certified using Oracle Internet Directory (OID) in coordination with Oracle Access Manager (OAM). For details on configuring OAM with WebLogic, see http://docs.oracle.com/cd/E15523_01/core.1111/e10043/osso.htm#CHDGCACF.

Deploying Primavera Analytics Administration Application in WebLogic

To add the Primavera Analytics Administration Application as a WebLogic application, complete the following steps:

- 1) Sign in to the WebLogic Administration Console:
`http://<server>:<port>/console`
 where:
 <server> is the IP address of the server.
 <port> port is the listening port. By default, 7001.
 /console is the default context for the WebLogic Administration Console.
- 2) In the **Welcome** window, log in using the user name and password that you created when you created your WebLogic domain.
- 3) In the **Change Center** pane of the Administration Console, click **Lock & Edit**.
- 4) In the **Domain Structure** pane, click **Deployments**.
- 5) In the **Summary of Deployments** pane, in the **Control** tab, click **Install**.
- 6) In the **Install Application Assistant** pane:
 - a. Go to <star_home>\starlapp. For example, **star_1\starlapp**.
 - b. Select **analytics.ear (open file directory)**.
 - c. Click **Next**.
- 7) In the **Install Application Assistant** pane:
 - a. Select **Install this deployment as an application**.
 - b. Click **Next**.
- 8) In the **Install Application Assistant** pane:
 - a. Click the server or cluster where you want to deploy the application.
 - b. Click **Next**.
- 9) In the **Install Application Assistant** pane, click **Next** to accept the default options.
- 10) Review the configuration settings you have chosen, then click **Finish** to complete the installation.
- 11) In the **Settings for Analytics** window, click **Save**.
- 12) In the **Change Center** pane, click **Activate Changes**.
- 13) In the **Domain Structure** pane, click **Deployments**.

- 14) In the **Summary of Deployments** pane, select **analytics**.
- 15) In the **Summary of Deployments** pane, in the **Control** tab:
 - a. Click the down arrow to the right of the **Start** button.
 - b. Click **Servicing all requests**.
- 16) In the **Start Application Assistant** pane, click **Yes**.
- 17) In the **Summary of Deployments** pane, view the link in the **State** column of the row that contains 'OPP.' Wait a few minutes, then click **Refresh**.
The OPP State column should show **Active**.
- 18) Verify that the **State** column for both files shows **Active**.
- 19) Sign out of the **Administration Console**.
- 20) Go to the **Login** page to ensure the deployment is Active.
Example URL:
`http://<host>:<port>/p6rdb`
where <host> is your server's host name and <port> is the listen port.

After you verify the activity of the deployment and state:

- 1) In the **Domain Structure** section, click **Security Realm**.
 - 2) Click on the realm name in the table.
 - 3) Click the **Users and Groups** tab.
 - 4) Click the **Users** sub tab.
 - 5) Click **New**.
 - 6) In the **Create a New User** form:
 - a. In the **Name** field, enter `admin`.
 - b. Enter the password and confirm password.
 - c. Click **OK**.
 - 7) Click on the user you created.
 - 8) Click the **Group** tab.
 - a. Create the group `p6rdbusers`, and add the **admin** user that you just created.
 - b. Click **Save**.
-
- **Notes:**
 - The default context root is **/p6rdb**, which is also the cookie path. If you change the context root or use a fronting web server with a different context root, you need to modify the cookie path used by the application to match. For more details on changing the cookie path, see WebLogic documentation.
 - For additional methods of deploying the Web application, such as using a managed server or clustering, see WebLogic documentation.
-

Configuring Primavera Analytics Web Administration Application

The Analytics Web Administration application supports the following data sources:

- ▶ P6 EPPM
- ▶ Primavera Unifier

Use this application to administer Primavera Data Warehouse from any location.

Note: Before you begin to use the Primavera Analytics Web Administration Application to administer Primavera Data Warehouse from any location, you must use the Primavera Data Warehouse configuration utility at least once to set up the database connection information. After that, you can access Primavera Analytics Web Administration Application URL.

This section describes how to configure the application for each data source.

Navigation Overview

To access and use the Analytics Web Administration application:

- 1) Sign in to: `http://<host>:<port>/p6rdb`
where <host> and <port> were configured when you deployed p6rdb.
- 2) In the sidebar, select the following icons to perform administrative tasks:
 - ▶  **Home:** Shows currently running STARETL processes for all data sources and enables you to stop a currently running STARETL process.
 - ▶  **Status:** Shows details on recently run STARETL processes for all data sources. You can view a Status Report and an ETL Log for each STARETL process.
 - ▶  **Codes:** Shows a master list of codes that are available and a subset of those which have been enabled for project, activity and resource data.
 - ▶  **UDFs:** Shows a list of all UDF codes that are available and a subset of those which have been enabled for project, activity, resource assignment, resource, and WBS data.
 - ▶  **Publication Status:** View the status of recent publication runs for a selected data source.
 - ▶  **Config:** Allows you to configure and setup the properties of the STARETL process for each data source, and OBIEE settings.

Configuring Settings for P6 EPPM Data Source

For a P6 EPPM data source, set up the configuration properties for STARETL runs and OBIEE settings as follows:

- 1) Sign in to the Primavera Analytics Administration Application:
`http://<host>:<port>/p6rdb`
- 2) In the sidebar, select  **Status**.

- 3) In the **Home** menu, select a **staretl<id>** or a **<Custom Name of a data source>**.
- 4) In the sidebar, select  **Config**.
- 5) For a P6 EPPM data source, set the following properties and then select **Save**:

Configuration Property	Description
In the Configurable Properties section, set up the following properties as required:	
Custom Name for Datasource	Enter a name for the data source for identification purposes. For example, <i>P6 EPPM Staging Data</i> .
Enable Activity Period Actuals	Controls the display of past period actuals for activities. Select any of the following values: ▶ <i>True</i> (default): Enables pay period actuals for activities. ▶ <i>False</i>: Disables pay period actuals for activities. Also see <i>Installing and Configuring Financial Periods</i> (on page 75).
ODI LoadPlan Auto Restart	Controls restart of all real-time ODI Load plans. Select any of the following values: ▶ <i>True</i> (default): Auto restarts ODI load plans for a maximum count of 3 if an initial run fails. ▶ <i>False</i>: Manually restart is required for all real-time ODI load plans.
Enable Resource Assignment Period Actuals	Controls the display of past period actuals for resources. Select any of the following values: ▶ <i>True</i> (default): Enables pay period actuals for resources. ▶ <i>False</i>: Disables pay period actuals for resources. Also see <i>Installing and Configuring Financial Periods</i> (on page 75).
Enable Relationship load	Controls the ETL from processing activity relationships. Select any of the following values: ▶ <i>True</i> (default): ETL runs will process relationship loads. ▶ <i>False</i>: ETL runs will not process relationship loads.

Configuration Property	Description
Turn off all History, keep Slowly Changing Dimensions	Controls history tables. Select any of the following values: ▶ <i>True</i>: Turns off history tables. Note: Slowly changing dimensions (SCDs) will continue to be captured at the project level without the history tables. ▶ <i>False</i> (default): Keeps history tables with SCDs. Note: To delete SCD data for an effective date or a specific date range, contact Oracle Support with a service request.
Disable Rebuild Index	Controls rebuilding of indexes in the cloud database. Select any of the following values: ▶ <i>True</i> (default): Does not rebuild indexes. Results in improved performance. ▶ <i>False</i>: Rebuilds indexes
Turn off Resource and Role Limits	Controls resource and role utilization scripts. Select any of the following values: ▶ <i>True</i>: Turn the scripts <i>off</i>. ▶ <i>False</i> (default): Keeps the scripts running.
Enabled Spread Snapshot History	Controls the use of spread snapshot history in the advanced analytics dashboard. Select any of the following values: ▶ <i>True</i>: Enables spread snapshot history. ▶ <i>False</i> (default): Disables spread snapshot history
Use project filter in data source 1	Selects filtered projects only. Select any of the following values: ▶ <i>True</i>: Ensures the next ETL run includes only projects filtered with the ETLFILTER code = 'Y'. ▶ <i>False</i> (default): Does not user project filters

Configuration Property	Description
Include Inactive Resources	Controls resource filtration. Select any of the following values: ▶ <i>True</i>: Ensures Primavera Data Warehouse tables will not filter out inactive resources. ▶ Note: If inactive resources are included, then spread data and other dimension tables will also be included. You may not need to process this extra resource assignment information. ▶ <i>False</i> (default): Filters out inactive resources.
Enable Slowly Changing Dimensions and Spread History	Controls the creation of slowly changing dimensions (SCDs) and spread history. Select any of the following values: ▶ <i>True (default)</i> : Capture SCDs and spread history. ▶ <i>False</i>: Turn off (SCDs) and spread history.
Load all Hierarchy Codes	Builds code hierarchies. Select any of the following values: ▶ <i>True</i>: Runs codes_hier.sql script and build code hierarchies with all codes that come from the source. ▶ <i>False</i> (default): Runs codes_hier_all.sql script and build hierarchies with codes from configStar.
ODI Log Level	Controls the level of detail included in the ODI log files. Select any of the following values: ▶ <i>Summary</i>: Displays a summarized content in the log file. ▶ <i>Detail</i> (default): Displays detailed information in the log file..
Degree of Parallelism for Rebuild Index	Select the number of threads running in parallel for the rebuilding index process.
If you plan to use ODI for projects in real-time, set the following properties to poll for changes in project data in P6 EPPM. The minimum poll interval is 5 minutes, and the maximum is 1440 minutes for all poll interval settings listed below:	
ODI Realtime Global Loadplan Poll Interval (in minutes)	Enter the frequency at which changes to global data is to be checked in P6 EPPM and captured in the data warehouse. By default the poll interval for ODI Realtime Global load plan is set to <i>10</i> minutes.

Configuration Property	Description
ODI Realtime On Demand Loadplan Poll Interval (in minutes)	The ODI Realtime On Demand Loadplan Poll Interval checks for changes to projects whose Enable Publication flag is selected in P6 EPPM. This process runs when new projects are added and published to the data warehouse by triggering the ODI On Demand load plan to run for the selected projects and include it in the data warehouse. Enter the frequency in minutes to check for changes to the Enable Publication flag for projects in P6 EPPM and send it to the data warehouse. By default the poll interval for running the On Demand ODI load plan is set to <i>60 minutes</i>. At each check, new projects with Enable Publication flag will be added to the data warehouse, and projects whose Enable Publication flag is disabled will be deleted in the data warehouse.
ODI Realtime Project Loadplan Poll Interval (in minutes)	The ODI Realtime Project Loadplan Poll Interval setting checks for changes in current projects in P6 EPPM. This configuration property checks those projects whose Data Warehouse Update Frequency (ODI Only) field is set as <i>Immediate</i> in the Project Preferences dialog box in P6 EPPM. Enter the frequency in minutes to send changes directly to the data warehouse. By default the poll interval value is set to <i>1440 minutes (24 hours)</i>.
In the OAS Settings section, setup the following properties:	
Mail Prefix	Customize the text that will be displayed in the subject line of email notifications that are sent regarding the status of ETL runs. For example, enter Analytics for status updates on ETL runs in Primavera Analytics.
P6 Base URL	Enter the URL in the following format: <code>http://<host>:<port>/p6</code>
OAS Cache Purge	Controls the clearance of OAS cache entries. Select any of the following values: ▶ <i>True</i>: Clears the OAS cache ▶ <i>False</i>: Retains the cache entries.

Configuration Property	Description
Send Email Notification	Enter the e-mail IDs of the personnel to be notified regarding the status or issues with the STARETL runs. Also select the events for which you wish to be notified: ▶ <i>Failure</i>: Email notifications sent only for failed ETL runs. ▶ <i>Success</i>: Email notifications sent only for successful ETL runs. ▶ <i>Both</i>: Email notifications sent for successful and failed ETL runs.

Loading P6 EPPM Codes to Data Warehouse

To extract and load a subset of P6 EPPM Codes to Primavera Data Warehouse:

- 1) Sign in to the Primavera Analytics Web Administration Application.
- 2) In the side bar:
 - a. Click **staretl<id>** for a specific data source.
 - b. Click **</> Codes**.
- 3) Select any of the following tabs to extract and load the following P6 EPPM codes to Primavera Data Warehouse:
 - ▶ **Project**
 - ▶ **Activity**
 - ▶ **Resource**

Note: Primavera Data Warehouse has a limit of 240 codes for each supported type (Project, Activity, and Resource). By default, Primavera Analytics exposes only the codes that have been enabled through the Primavera Data Warehouse Configuration Utility or the Primavera Analytics Administration Web Application.

- 4) To select a code to be loaded to Primavera Data Warehouse:
 - a. In the **Available Codes** list, select a code.
 - b. Click the right-arrow button to move the selected code to the **Enabled Codes** list.
 - c. Use the up and down arrow buttons to change the order of the codes in the **ID** column.
 - d. Select **Save Changes**.
- 5) To deselect a code:
 - a. In the **Enabled Codes** list, select a code.
 - b. Click the left-arrow button to move the selected code to the **Available Codes** list.
 - c. Select **Save Changes**.

Note: The Primavera Analytics Web Administration Application cannot configure codes for a Primavera Unifier data source. Primavera Unifier code configuration is done within Primavera Unifier. See the Primavera Unifier documentation for details.

Additional Information on Codes

- ▶ On the **Activity** tab, the scope each Activity code in the **Enabled Codes** list can further be configured at the following levels: **Global**, **EPS**, and **Project** in Primavera Data Warehouse.

Note: In the event that the same code name is mapped at different levels (Global, EPS, and Project) the **Scope** column is used to determine at which level an activity code exists. For example, if you have a global activity code called *MyCode*, and a project activity code called *MyCode*, the scope setting would determine which activity code value to use.

- ▶ All codes configured in the configuration utility are available as hierarchies in Primavera Data Warehouse.
 - ▶ Full path values or specific node level values are available for each code.
 - ▶ Code Hierarchies apply to only Project, Activity (Global only), and Resource codes.
 - ▶ Hierarchies do not apply to Activity codes in Project or EPS codes.
 - ▶ There are no additional configuration steps required to use code hierarchies.

Loading UDFs to Primavera Data Warehouse

Project, Activity, Resource, Resource Assignment, and WBS level User-Defined Fields (UDFs) can be migrated from P6 EPPM.

To migrate UDFs from P6 EPPM to Primavera Data Warehouse for a data source:

- 1) Sign in to the Primavera Analytics Web Administration Application.
- 2) In the side bar:
 - a. Click **staretl<id>** for a specific data source.
 - b. Click  **UDFs**.
- 3) Select any of the following tabs to extract and load the following P6 EPPM codes to Primavera Data Warehouse:
 - ▶ **Activity**
 - ▶ **Project**
 - ▶ **Resource Assignment**
 - ▶ **Resource**
 - ▶ **WBS**
- 4) Select any of the following sub-tabs for the UDF being loaded:
 - ▶ **Cost**
 - ▶ **Date**
 - ▶ **Non-Cost**

Number and Integer UDF types are displayed in the **Non-Cost** folders.

- ▶ **Text**
- ▶ **Indicator**

For additional information on configuring Indicator UDFs in OBI, see http://blogs.oracle.com/P6Analytics/entry/indicator_type_udfs_part_2.

- 5) To select a UDF to be migrated to Primavera Data Warehouse, complete the following steps:
 - a. In the **Available UDFs** list, select the UDF.
 - b. Click the right arrow-button.
 - c. Select **Save Changes**.
- 6) To deselect a UDF, complete the following steps:
 - a. Click the appropriate sub-tab.
 - b. In the **Enabled UDFs** list, select the UDF.
 - c. Click the left-arrow button.
- 7) Select **Save Changes**.

-
- **Notes:**
 - Primavera Data Warehouse has a limit of approximately 220 UDFs for each supported level (Project, WBS, Activity, Resource, and Resource Assignment) and data type (Cost limit is 220, Non-Cost limit is 220, and a combination comprising Date, Text, and Integer of 220). The limit for Indicator type UDFs for each level is 40. For example, you can select a total of 220 UDFs that includes Project Cost UDFs, WBS Cost UDFs, Activity Cost UDFs.
 - Formula Driven UDF values are not brought over during the STARETL process. The calculated UDFs can be selected as columns but the values will be null in the Primavera Data Warehouse database.
 - By default, Primavera Analytics exposes only the UDFs that have been enabled through the Primavera Data Warehouse Configuration Utility or Primavera Analytics Administration Web Application.
-

Configuration Settings for Unifier Data Source

For a Unifier data source, set up the configuration properties for STARETL runs and OAS settings as follows:

- 1) Sign in to the Primavera Analytics Administration Application:
http://<host>:<port>/p6rdb
- 2) In the sidebar, select  **Status**.
- 3) In the **Home** menu, select a **staretl<id>** or a **<Custom Name of a data source>**.
- 4) In the sidebar, select  **Config**.
- 5) For a Unifier data source, set the following properties and then select **Save**:

Configuration Property	Description
In the Configurable Settings section, setup the following properties:	
Custom Name for Datasource	Enter a name for the data source for identification purposes. For example, Unifier Production Data.
Disable Rebuild Index	Controls rebuilding of indexes in the cloud database. Select any of the following values: ▶ <i>True</i>: Does not rebuild indexes. Results in improved performance. ▶ <i>False</i> (default): Rebuilds indexes.
Degree of Parallelism for Rebuild Index	Select the number of threads running in parallel for the rebuilding index process.
ODI Log Level	Controls the level of detail included in the ODI log files. Select any of the following values: ▶ <i>Summary</i>: Displays a summarized content in the log file. ▶ <i>Detail</i> (default): Displays detailed information in the log file..
Enable Unifier EVM	Controls the usage of Unifier Earned Value Management data. Select any of the following values: ▶ <i>True</i>: Populates the cloud database with EVM data. ▶ <i>False</i> (default): Does not populate the cloud database with EVM data. Results in improved performance.
Store Unifier History	Controls Unifier history tables. Select any of the following values: ▶ <i>True</i> (default): Keeps the history tables running. ▶ <i>False</i>: Disables all history tables.
If Store Unifier History is set to <i>True</i> , you can set the history levels for the following:	

Configuration Property	Description
Use P6 project Name for Unifier Project	Controls the source that will be used for naming a Unifier project. Select any of the following values: ▶ <i>True</i>: if the Unifierproject ID is identical in P6 and Unifier, then the project name from P6 will be used for the Unifier project. ▶ <i>False</i>: Uses the project name from Unifier.
Unifier BP Data History Level	Controls BP history level. Select the frequency of BP history tables as <i>Week</i> or <i>Month</i> to capture the history of BP dimensions. Note: History Level is applicable only for history fact tables like W_BP_HIST_F and W_BP_LINE_HIST_F.
Unifier Level Data History Level	Controls level history (FMRE). Select the frequency of BP history tables as <i>Week</i> or <i>Month</i>.
Unifier Cash Flow and Cost Sheet Data History Level	Controls the cash flow history and cost sheet history tables. Select the frequency of history tables as <i>Week</i> or <i>Month</i>.
Unifier Space Data History Level	Controls space history tables. Set this value to <i>Month</i>.
Enable Unifier Slowly Changing Dimensions	Controls the capability to see how business process has changed over time. A business process history can then be generated weekly or monthly. When you select Refresh All, it overwrites all previous history and only the latest history data is made available. Use this setting for Project / Shell, BP and BP Line Items and BP UDFs to generate reports based on historical data. Select any of the following values: ▶ <i>True</i>: Captures history for all projects and business processes. This includes non-dynamic Business process related dimensional data, and dynamic dimensional data for Business process (UDFs) metadata. ▶ <i>False</i>: Disables business process history

Configuration Property	Description
Unifier Project Shell History Level	Controls project shell history levels. Select the frequency of BP history tables as <i>Week</i> or <i>Month</i> .
In the OAS Settings section, setup the following properties:	
Mail Prefix	Customize the text that will be displayed in the subject line of email notifications that are sent regarding the status of ETL runs. For example, enter Analytics for status updates on ETL runs in Primavera Analytics.
Unifier Base URL	Enter the URL in the following format: <i>http://<host>:<port>/bluedoor</i>
OAS Cache Purge	Controls the clearance of OAS cache entries. Select any of the following values: ▶ <i>True</i>: Clears OAS cache entries. ▶ <i>False</i>: Retains the cache entries.
Send Email Notification On	Enter the e-mail IDs of the personnel to be notified regarding the status or issues with the STARETL runs.. Also select the type of events for which they are to be notified: ▶ <i>Failure</i>: Email notifications sent only for failed ETL runs. ▶ <i>Success</i>: Email notifications sent only for successful ETL runs. ▶ <i>Both</i>: Email notifications sent for successful and failed ETL runs.

Using Primavera Analytics Web Administration Application

Use the Primavera Analytics Web Administration Application to configure, run, and view details of currently running and recently run STARETL processes associated with the following data sources:

- ▶ P6 EPPM
- ▶ Primavera Unifier

You can also use this application to configure P6 EPPM codes and UDFs for Primavera Data Warehouse.

For initial installation, see ***Installing Primavera Analytics Web Administration Application*** (on page 41).

Note: Before you begin to use the Primavera Analytics Administration Application to administer Primavera Data Warehouse from any location, you must use the Primavera Data Warehouse configuration utility at least once to set up the database connection information. After that, you can access Primavera Analytics Cloud Administration Application URL.

Running the STARETL Process

The Primavera Analytics Web Administration Application contains a **staretl** section for each data source.

To run the STARETL process for a data source:

- 1) Sign in to the Primavera Analytics Web Administration Application.
http://<host>:<port>/p6rdb
- 2) In the sidebar, select  **Status**.
- 3) From the  **Home** ▾ menu, select a **staretl<id>** or a **<Custom Name for DataSource>**.

Note: <id> is the identifier of the data source.

- 4) From the **Actions** menu, select **Run ETL** to run a STARETL process immediately.

Stopping the STARETL Process

To stop the STARETL process run for a data source:

- 1) Sign in to Primavera Analytics Web Administration Application.
http://<host>:<port>/p6rdb
- 2) In the sidebar, select  **Status**.
- 3) Select **Stop** for a currently running STARETL process.
- 4) View the log file, **YYYYMMDDProcessID_failed.log** created in the folder, **<PDW Install Folder>\star\etl_homes\STARETL<id>\log**.

Scheduling STARETL Process Runs

To schedule a STARETL process run for a data source:

- 1) Sign in to the Primavera Analytics Web Administration Application.
http://<host>:<port>/p6rdb
- 2) In the sidebar, select  **Status**.
- 3) From the  **Home** ▾ menu, select a **staretl<id>** or a **<Custom Name for DataSource>**.

Note: <id> is the identifier of the data source.

- 4) From the **Actions** menu, select **Schedule Etl**.
- 5) In the **Schedule Frequency** field, select the frequency for the STARETL process run.
 - ▶ If you select *None*, no STARETL runs will be scheduled for a data source.
 - ▶ If you select *Daily*:
 - a. In the **Run ETL at** field, enter the time for the daily process run.
 - b. Select **Save**.
 - c. To set up multiple ETL schedules daily, select **Add** and enter date and time for the ETL run.

Note: Schedule multiple ETLs daily at least 2 hours apart.

- ▶ If you select *Weekly*:
 - a. In the **Run ETL at** field, enter the time for the process run.
 - b. Select the days for the STARETL process run.
 - c. Select **Save**.
- 6) (For non-ODI on-premises installations only) In the **Log Level** field, select the level of detail to be included in the ETL log of the scheduled STARETL process run:
 - ▶ **Extra Debug Information:** For more fine grained information on each step and script that is run. It also includes general information, errors, and warnings.
 - ▶ **Debug and Trace Information:** For detailed output of each script, query, and connection. It also includes general information, errors, and warnings.
 - ▶ **General Information** (default): For errors, warnings, and informational messages on the progress of each step.
 - ▶ **Errors and Warnings:** For errors and warnings only.
 - ▶ **Errors Only:** For errors only.
 - 7) Select **Save**.

Note: You can also use Task Scheduler (with Windows) or a cron job (with UNIX or Linux) to schedule STARETL process runs. See the *Primavera Analytics On-Premises Administration Guide* for details.

Reviewing the Global Status of STARETL Runs

The Global Status page displays the ETL status of STARETL runs for all data sources, across multiple products.

To access the Global Status page and view details of all STARETL runs:

- 1) Sign in to Primavera Analytics Administration Web Application.
<http://<host>:<port>/p6rdb>
- 2) In the sidebar, select  **Status**.

- 3) The following information is displayed for each STARETL process:
- ▶ **Custom Name:** The custom name given to a data source.
 - ▶ **ETL Name:** The identifier for the data source for the STARETL process.
 - ▶ **ETL ID:** The unique identifier for the STARETL process run.
 - ▶ **ETL Start Date:** The start date and time for the STARETL process run based on the server time.
 - ▶ **ETL End Date:** The end date and time for the STARETL process run based on the server time.
 - ▶ **Status:** The status of the STARETL process run. These include:
 - **OK:** The STARETL process completed successfully.
 - **Running:** The STARETL process is currently running.
 - **Failed:** The STARETL process has failed. View the log for more information about the failure.
 - ▶ **Log:** The link to the ETL log of the selected STARETL run.

Reviewing the Status of Publication Service Runs

Publication services are responsible for ensuring that the data is up-to-date prior to running the STARETL process. Publication services are available for:

- ▶ P6
- ▶ Unifier

To view the status of recent publication runs for the relevant product:

- 1) Sign in to the Primavera Analytics Web Administration Application.
http://<host>:<port>/p6rdb
- 2) From the  **Home** ▾ menu, select a **staretl<id>** or a **<Custom Name for DataSource>**.

Note: <id> is the identifier of the data source.

- 3) In the sidebar, select  **Status**.
- 4) From the **Status** page, select  **Publication Status** in the sidebar.
- 5) On the **Publication Status** page, the following information for each publication service run:
For P6 Publication Services:
 - ▶ **Job ID:** A unique identifier for the publication service.
 - ▶ **Job Type:** The category of the publication service to which it belongs.
 - ▶ **Job Name:** The name of the publication service.
 - ▶ **Recur Type:** The recurrence of the publication service. The following values may display:
 - *RT_WebEnabled:* Indicates that the job is a recurring job and is scheduled
 - *RT_RecurDisabled:* Indicates that the job is a scheduled recurring job, but is currently disabled

- *RT_WebASAP*: Indicates that the job is a one-time job, and must be run at the earliest
- ▶ **Status Code**: The status of the publication service. The following values may display:
 - *Cancelled*: The publication service has been canceled.
 - *CompError*: The publication service has been completed with errors.
 - *Completed*: The publication service has been completed.
 - *Delegated*: The publication service is waiting to complete child jobs.
 - *Failed*: The publication service has failed to complete.
 - *Pending*: The publication service is in the queue waiting to be run.
 - *Running*: The publication service is currently in process.
- ▶ **Last Run Date**: The most recent date on which the publication service was run.

For Unifier Publication Services:

- ▶ **Job ID**: A unique identifier for the publication service.
- ▶ **Start Date**: The date on which the publication service was run.
- ▶ **Status**: The status of the publication service. The following values display:
 - ▶ *Canceled*: The publication service has been canceled.
 - ▶ *Failed*: The publication service has failed to complete.
 - ▶ *Finished*: The publication service has been completed.
 - ▶ *Not Started*: The publication service is in the queue.
 - ▶ *Running*: The publication service is currently in process.
- ▶ **End Date**: The date on which the publication service ended.
- ▶ **Refresh All Data**: Indicator that displays if all data was refreshed before running the publication service. The following values can display: *True*, *False*.
- ▶ **Type**: The type of publication service. The following values can display:
 - *On Demand*: Indicates the job was set up manually.
 - *Scheduled*: Indicates the job was automatically started based on a scheduled date and time.
- ▶ **Submit Date**: The date on which the publication service was submitted for a run.

6) Select **Refresh** to update the publication services run list as needed.

Starting and Restarting ODI Load Plans

To manage and run ODI load plans:

- 1) Sign in to the Primavera Analytics Administration Web Application.
http://<host>:<port>/p6rdb
- 2) From the  **Home** ▾ menu, select a **staretl<id>** or a **<Custom Name of a data source>**.
- 3) In the **Load Plan Status** section of the **Status** page, select any of the following buttons:
 - ▶ Select **Start** to run a specific ODI load plan.
 - ▶ Select **Restart** for a currently ongoing run.

Note: In the sidebar, select  **Config** and set the **ODI LoadPlan Auto Restart** property to *True* to auto-restart for a maximum count of 3 if an initial run fails.

Accessing Primavera Data Warehouse Log Files

Every time you run the STARETL process, Primavera Data Warehouse creates extensive log files that provide information about the installation and daily operations details of each step of the process. Inspect the log files after each run of the STARETL process to determine if any issues exist.

The following log files are created after each STARETL run:

- ▶ **<yyyymmdd>ProcessId.log**: Contains the details of the SQL commands run to perform the database refresh updates.
- ▶ **<yyyymmdd>ProcessId.html**: Contains results of the processes run to create the users, tables, and transfer of data. This log file provides the time it took for each step to run. It is derived from the ETL_PROCESSMASTER, ETL_PROCESSINFO, and ETL_PROCESSEXCEPTION tables.

Note: **<yyyymmdd>** represents the date the STARETL process run.

Using Primavera Analytics Web Administration Application

To access the log files from the Primavera Analytics Web Administration Application:

- 1) Sign in to Primavera Analytics Web Administration Application.
- 2) In left pane, select  **Status**.
- 3) Select the **Log** tab.

Using the STARETL Process Server

To access the log files on the STARETL process server, go to **<PDW Install Folder>\staretl_homes\staretl<id>\log**

If a problem occurs with Primavera Data Warehouse and the log files do not provide sufficient information, see **Primavera Data Warehouse Troubleshooting** (on page 91).

Accessing Recent STARETL and Load Plan Logs

To access the log of a specific STARETL run of a data source:

- 1) Sign in to Primavera Analytics Administration Web Application.
http://<host>:<port>/p6rdb
- 2) In the sidebar, select  **Status**.
- 3) From the **Global Status** menu select **staretl<id>** or **<Custom Name for data source>**.

- 4) In the **Load Plan Status** section, review the following information for recent load plans:
 - ▶ **Name:** Name of the load plan associated with the data source
 - ▶ **Status:** Current status of the load plan.
 - ▶ **Last Successful Time:** Date and time that the load plan completed successfully.
 - ▶ **Last Failed Time:** Date and time that the load plan failed..
 - ▶ **Number of Retries:** Number of attempts made to rerun the load plan.
 - ▶ **View Log:** Link to the log file of the load plan.
- 5) In the **Recently Running ETLs** section, review the following information for recent STARETL runs:
 - ▶ **ETL Name:** Identifier for the data source associated with the STARETL run.
 - ▶ **ETL ID:** Unique identifier for the STARETL run.
 - ▶ **ETL Start Date:** Start date and time for the STARETL run based on the server time.
 - ▶ **ETL End Date:** End date and time for the STARETL run based on the server time.
 - ▶ **Status:** Status of the STARETL run. These include:
 - **OK:** The STARETL run completed successfully.
 - **Running:** The STARETL run is currently running.
 - **Failed:** The STARETL run failed. View the log for more information about the failure.
 - ▶ **Log:** Links to the log file of the STARETL run.
- 6) Select any of the following buttons to complete the relevant task:
 - ▶ Select **Refresh** to view an updated list of STARETL runs and ODI load plans
 - ▶ Select **Restart** if you want to restart a load plan.
 - ▶ Select **Load Security** if you want to add new P6 users without running an ETL.

Customizing STARETL Process Runs for a Data Source

To customize the STARETL process runs for a specific data source:

- 1) Sign in to the Primavera Analytics Administration Application:
http://<host>:<port>/p6rdb
- 2) In the sidebar, select  **Status**.
- 3) In the **Home** menu, select a **staretl<id>** or a **<Custom Name of a data source>**.
In the sidebar, select  **Config**.
- 4) Set the following ETL properties to perform different functions depending on their selected value:
 - ▶ **Load all Hierarchy Codes** builds code hierarchies.
Select *True* to run **codes_hier.sql** script and build code hierarchies with all the codes that come from the source.
Select *False* to run **codes_hier_all.sql** script and build hierarchies with codes from **configStar**. This is the default value.

- ▶ **ODI LoadPlan Auto Restart** controls restart of ODI Load plans.
Select *True* to auto restart all real-time ODI load plans. This is the default value.
Select *False* to manually restart all real-time ODI load plans.
- ▶ **Include Inactive Resources** controls resource filtration.
Select *True* to ensure Primavera Data Warehouse tables will not filter out inactive resources.
Select *False* to filter out inactive resources. This is the default value.
If you include inactive resources, the spread data and other dimension tables will also include them. You may not need to process this extra resource assignment information.
- ▶ **Turn off all History, keep Slowly Changing Dimensions** controls history tables.
Select *True* to turn off history tables. Slowly changing dimensions (SCDs) will continue to be captured on the project level without the history tables.
Select *False* to keep history tables on with SCDs. This is the default value.
- ▶ **Use project filter in data source 1** selects filtered projects only.
Select *True* to ensure the next ETL run includes only projects filtered with the `ETLFILTER code = ''Y'`.
The default value is *False*.
- ▶ **Enable Slowly Changing Dimensions and Spread History** controls the creation of SCDs and spread history.
Select *True* to capture slowly changing dimensions (SCDs) and spread history. This is the default value.
Select *False* to turn off (SCDs) and spread history.
- ▶ **Turn off Resource and Role Limits** controls resource and role utilization scripts.
Select *True* to turn the scripts *off*.
Select *False* to keep the scripts running. This is the default value.

Unifier Configuration Settings

Set the following properties to configure STARETL runs for a Unifier data source.

- ▶ **Store Unifier History** controls Unifier history tables.
Select *True* to keep the history tables running. This is the default value.
Select *False* to disable all history tables.
- ▶ If **Store Unifier History** is set to *True*, you can set the history levels for the following:
 - ▶ **Unifier Space Data History Level** controls space history tables. Set this value to *Month*.
 - ▶ **Use P6 project Name for Unifier Project** controls the source that will be used for naming a Unifier project.
When set to *True*, if the Unifierproject ID is identical in P6 and Unifier, then the project name from P6 is used for the Unifier project.
Select *False* to use the project name from Unifier.
 - ▶ **ODI LoadPlan Auto Restart** controls restart of ODI Load plans.
Select *True* to auto restart all real-time ODI load plans. This is the default value.
Select *False* to manually restart all real-time ODI load plans.

- ▶ **Unifier Project Shell History Level** controls project shell history levels. Select the frequency of BP history tables as *Week* or *Month*.
- ▶ **Unifier Level Data History Level** controls level history (FMRE). Select the frequency of BP history tables as *Week* or *Month*.
- ▶ **Unifier BP Data History Level** controls BP history level. Select the frequency of BP history tables as *Week* or *Month*.
- ▶ **Unifier Cash Flow and Cost Sheet Data History Level** controls the cash flow history and cost sheet history tables. Select the frequency of history tables as *Week* or *Month*.

Additional Settings

This chapter describes additional settings for Primavera Data Warehouse.

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Data Warehouse Settings

In earlier versions of Primavera Analytics, settings were stored in property files as well as tables within the data warehouse. Those settings are now stored only in the data warehouse tables. ETL_GLOBAL_PARAMETER stores global settings that affect the entire data warehouse. ETL_PARAMETER stores data source-specific settings for each P6 EPPM or Primavera Unifier source. The settings are stored as simple key = value pairs, where **p_feature** represents the key and **p_1** represents the value. For example:

```
select p_feature, p_1 from etl_global_parameter
where p_feature = 'db.star.version';
```

This would return the following:

P_FEATURE	P_1
1 db.star.version	21.12.0.0

For source-specific parameters, you also need to filter based data source. For example:

```
select p_feature, p_1 from etl_parameter
where p_feature = 'db.pmdb.application.username' and datasource_id = 1;
```

This would return the following:

P_FEATURE	P_1
1 db.pmdb.application.username	PXRPTUSER

Adding Data Sources Beyond the Maximum Amount of Partitions Created

When you created the Primavera Data Warehouse schema and enabled partitioning, the Configuration Utility created table objects using a list partition based on the number of data source IDs identified on the Partitioning ETL Settings page. If you require additional data sources in the Primavera Data Warehouse schema beyond the total amount of partitioning data source IDs that you originally allocated, complete the following steps:

Note: To confirm the amount of list partition counts in your Primavera Data Warehouse schema, connect to the database instance using the Data Warehouse schema owner (by default, STARUSER) and run the following statement:

```
select unique partition_count from user_part_tables
where partitioning_type = 'LIST';
```

- 1) Back up your existing Primavera Data Warehouse schema.
- 2) Do the following to use the Primavera Data Warehouse Configuration Utility to increase the number of list partitions:
 - a. Go to **<PDW Install Folder>\starlconfig**.
 - b. Run **configStar.cmd** (with Windows) or **configStar.sh** (with UNIX or Linux).
 - c. In the Configuration Utility, go to the **ETL Settings** page.
 - d. In the **Datasource ID** field, enter the number of list partitions you need.

Note: You can set up to 99 list partitions. The set value can exceed the amount actual data sources you need.

- 3) Do the following to recreate your Primavera Data Warehouse schema to include the increased number of list partitions and repopulate your original data source data:
 - a. Run **setup.bat "-r" "-u"** (with Windows) or **setup.sh -r -u** (with UNIX or Linux) from **<PDW Install Folder>\starletl_homes\staretl1/scripts** folder to recreate the Primavera Data Warehouse tables with the new number of partitions. Note that, at this point, the history tables have been moved to backup tables and your schema has been recreated with data from your first data source only.
 - b. Go to **<PDW Install Folder>\starletl_homes\staretl<id>** where **<id>** is the identifier for your next data source.
 - c. Run **staretl.bat** (with Windows) or **staretl.sh** (with UNIX or Linux) to repopulate Primavera Data Warehouse.
 - d. Repeat steps b and c for each data source.
 - e. After all of the original data source have been recreated, locate the **W_PROJECT_D** table and verify that there is a **datasource_id =<data source ID>** for each data source.

Running User-Defined ETL Scripts

Primavera Data Warehouse supports adding user-defined steps to the ETL process, which can be used to extract, transform, and load additional data into the Primavera Data Warehouse schema. When using this option, user-defined scripts are automatically run as part of the standard ETL process.

To run user-defined scripts during the STARETL process, complete the following steps:

- 1) Create scripts and keep a copy in a safe place.

Note: Each script should have an "EXIT" at the end.

- 2) Make sure each script runs successfully with good performance in sqlplus.
- 3) Copy the scripts to the **<install_folder>/scripts/user_scripts**. Scripts will be picked up by the STARETL process.
- 4) If you want some of the scripts to run in certain order, add the script name to the file **<install_folder>/res/priority/user_scripts.txt**, one line for each script file name (no path information is needed). The scripts will run in the order they are listed. Scripts not in **user_scripts.txt** are will run in no specific order after the listed scripts.
- 5) Run **staretl.bat** (with Windows) or **staretl.sh** (with UNIX or Linux). The user-defined scripts are the last step of the STARETL process.

Note: Running **configStar.cmd** or **configStar.sh** will not override these scripts.

Filtering Data for Primavera Data Warehouse

You can apply a filter during the STARETL process that can limit the data loaded into Primavera Data Warehouse based on a specific criteria. By creating a filtered view, you can limit the projects you include in Primavera Data Warehouse to a portfolio, an EPS, or any other specified criteria. In this way, you can customize Primavera Data Warehouse with only the projects that are needed.

If you want to create a filtered source of data for loading into Primavera Data Warehouse, the filter must be created with the user account that was created for the publication tables/views (for example, PXRPTUSER) with the P6 EPPM database instance.

Before creating a new filtered view, Oracle recommends that a new data source be added to Primavera Data Warehouse. Doing this ensures that the existing STARETL process and associated data is unaffected by any filtering that is occurring. To create a new data source, see the *Primavera Data Warehouse Installation and Configuration Guide* for details on how to create and set up a new data source for details.

Filtering P6 EPPM Data

The following example demonstrates how to create a new filtered view (called **My Top 10 Projects**), name the filter (**it_portfolio_view**) and how to tell the STARETL process to use this new filtered view when extracting, transforming, and loading data into Primavera Data Warehouse.

- 1) Log in to the P6 EPPM instance (with SQL Plus, SQL Developer, and so on) with the user account for Publication Tables/views (for example, PXRPTUSER).
- 2) Use the following statement to create the **it_portfolio_view** filter:

```
create or replace view it_portfolio_view as select PROJECTOBJECTID objected from
projectportfolio pp, projectprojectportfolio ppp where pp.objectid =
ppp.PROJECTPORTFOLIIOBJECTID and pp.name = 'My Top 10 Projects'
```

- 3) Upon successful completion of the sample filter, log out of the instance.
- 4) Log in to the Primavera Data Warehouse database instance as the schema owner (for example, the STARUSER account).
- 5) Use the following statement to add a setting into the ETL_PARAMETER table with the name of the view you created:

```
insert into etl_parameter(p_feature, p_1, datasource_id)
values ('star.project.filter.ds1', 'it_portfolio_view', 1);
commit;
```

- 6) Go to **<PDW Install Folder>\starletl_homes\staretl<id>**.
- 7) Run **staretl.bat** (with Windows) or **staretl.sh** (with UNIX or Linux).

Filtering Primavera Unifier Data

The following example demonstrates how to create a view for only active projects and a filter called **active_projects**.

- 1) Log in to the Primavera Unifier instance (with SQL Plus, SQL Developer, and so on), with the schema owner account (for example, unifier).
- 2) Use the following statement to create the **active_projects** filter:

```
create or replace view active_projects as select project_object_id objected from
sys_stg_project where project_status = 'Active'
```

- 3) Upon successful completion of the sample filter, log out of the instance.
- 4) Log in to the Primavera Data Warehouse database instance as the schema owner (for example, the STARUSER account).
- 5) Use the following statement to add a setting into the ETL_PARAMETER table with the name of the view you created:

```
insert into etl_parameter(p_feature, p_1, datasource_id)
values ('star.project.filter.ds1', 'active_projects', 1);
commit;
```

- 6) Go to **<PDW Install Folder>\star\etl_homes\staretl<id>**.
- 7) Run **staretl.bat** (with Windows) or **staretl.sh** (with UNIX or Linux).

Built-In Filtering for P6 Projects

Setup project-level filtering for the ETL process from the P6 application, and enable it from the Primavera Analytics Administration as follows:

- 1) Sign in to P6 application.
- 2) Create a new project code. For example, ETLFilter.
- 3) Assign a code value. For example, 'Y'.
- 4) Assign all projects that are to be included in this filter.

In the extended schema, a new default view, ETLFILTER, has a WHERE clause criteria to gather the project object ID for all projects with this code assignment.

To configure for the Data Warehouse:

- 1) Sign in to Primavera Analytics Administration application.
- 2) Select the data source. For example, staretl1.
- 3) Select the Config section and view the configuration options.
- 4) Locate *star.project.filter.ds1*.
- 5) To use this default filtering mechanism set this to *True* and save.

The next ETL run will include projects only in this filter.

User-Defined ETL Script Samples (P6 EPPM Only)

Oracle provides sample scripts to demonstrate how to extract, transform, and load (ETL) additional user-defined fields from P6 EPPM to the Project, WBS, and Activity dimensions in the Primavera Data Warehouse schema.

The sample scripts are available in **<install folder>\<operating_system>\sample\user_scripts** on your release media or download.

To run the sample scripts:

- 1) Copy the .sql files to **<install_folder>\scripts\user_scripts**.
- 2) Copy **user_scripts.txt** to **<install_folder>\res\priority**. The listing of the scripts in this file specifies the order in which the scripts will run.
- 3) Run **staretl.bat** (with Windows) or **staretl.sh** (with UNIX or Linux).

Note: The samples add UDF field values to Project, WBS, and Activity

dimensions.

Backing Up Primavera Data Warehouse

Oracle recommends standard backup routines occur on the Primavera Data Warehouse instance. As a general rule, at a minimum, Oracle recommends that you schedule backups of the Primavera Data Warehouse instance to occur at least at the same frequency as the lowest level of History interval (daily, weekly, monthly) for all the projects in your P6 EPPM database. For example, if one project in P6 EPPM is set to capture history daily, set up daily backups of your Primavera Data Warehouse database. Establishing this rule with the Primavera Data Warehouse instance ensures the integrity of Primavera Data Warehouse historical data.

Note: For Primavera Unifier, the lowest level of History interval is weekly.

Primavera Data Warehouse Security Configurations

Use the following procedures to configure additional security options for Primavera Data Warehouse. The steps include adding a new Primavera Data Warehouse user, setting up security, and filtering out inactive resources. See the *Primavera Analytics Security Guide* for more details on security.

P6 EPPM and Primavera Unifier Privileges

Primavera Data Warehouse adheres to the same user privileges and access rights as P6 EPPM and Primavera Unifier. Additional privileges may need to be granted to specific P6 EPPM and Primavera Unifier users. These privileges include Organizational Breakdown Structure (OBS), Cost access, and Resource access. Refer to the *P6 EPPM Application Administration Guide* for details about user privileges.

The following table briefly describes the Primavera Data Warehouse and P6 EPPM privileges:

Type	Description
OBS Access	Users who have OBS access in P6 EPPM will have OBS access in Oracle Analytics Server.
Edit EPS Costs/Financials	Users who have access to projects in the P6 EPPM database and who have this privilege set will have the same privilege in the Primavera Data Warehouse database.

Type	Description
Resource Access	Resource access can be set to one of the following: All resource access: The user will have unrestricted access to resources. None: The user cannot access any resources. Specific resource access: The user can only access a specific resource.

Note: After modifying any P6 EPPM security privilege that affects Primavera Data Warehouse, it is required that the "Publish Security" Global Scheduled Service be run prior to running the STARETL process. This ensures that the correct privileges have been applied to the user account. For more information on running Global Scheduled Services, see ***Configuring and Running P6 EPPM Publication Services*** (on page 19) for more details.

Primavera Unifier user privileges are controlled both at the Company and the Project levels. For more details, see Primavera Unifier documentation.

Adding P6 EPPM Users for Primavera Data Warehouse

If you are using only Primavera Unifier, you can skip this topic. See ***Adding Primavera Unifier Users for Primavera Data Warehouse*** (on page 72) instead.

In order for a P6 EPPM user to access data in Primavera Data Warehouse, you must set up the correct user security in P6 EPPM prior to running the STARETL process.

To configure a new P6 EPPM user to access the data within Primavera Data Warehouse, complete the following steps:

- 1) Log in to P6 EPPM with a user account that has Administrator privileges.
- 2) In P6 EPPM, go to the **Administer** menu link and select **User Access**.
- 3) From the **User Access** window, create or modify the user accounts that will need access to data within Primavera Data Warehouse.

Note: When accessing data in Primavera Data Warehouse from external applications (for example, Oracle Analytics Server), the username must match exactly between P6 EPPM and any external application. Therefore, username must adhere to the requirements of all applications (for example, P6 EPPM, Oracle Analytics Server, and so on) in order to function correctly. For example, P6 EPPM may allow characters for the username that Oracle Analytics Server does not allow. You must ensure the username will work in all applications.

- 4) Select the user account, and in the lower section of the screen, click the **Module Access** tab.
- 5) In the **module access** panel, place a check mark (double click in the checkbox so it becomes selected) in the access column next to the **P6 Analytics** module to grant this users access to data in Primavera Data Warehouse.
- 6) Click the **Save** icon on the toolbar to save the module access settings for this user.
- 7) Repeat these steps for each user account that will need to access data from Primavera Data Warehouse.
- 8) Once all the user privileges and access in P6 EPPM are set up and complete, the "Publish Security" Global Schedule Service needs to be run. See **Configuring and Running P6 EPPM Publication Services** (on page 19) for details about publication services and how to configure them to run at regularly scheduled intervals.

Note: You can schedule this service to run immediately or later, but it must run to successful completion prior to running the STARETL process.

Adding Primavera Unifier Users for Primavera Data Warehouse

For a user to access data in the Primavera Unifier through OBI, you must set up security in both P6 EPPM and OBI.

To add a new user:

- 1) In Primavera Unifier, go to the **Company Workspace** tab and switch to Admin mode.
- 2) In the left Navigator, click **Access Control**.
- 3) In the right pane, select **Administration Mode Access > Analytics**.
- 4) In the **Permission Settings** window, click **Add** to add, modify, or remove permission settings.
- 5) In the **Permission Settings** window, click **Add Users/Groups**.
- 6) In the **Users/Groups** window, select users and groups you want to add and click **Add**.
- 7) Click **OK** to return to the **Permission Settings** window.
 - a. Select the users and groups in **Select Users/Groups** (in the upper portion of the window).

- b. Select the appropriate level of access in **Permissions Settings** (in the lower portion of the window):
 - **View**: Allows users and groups to open and view the contents in the **Analytics** node. Users with View permission cannot make any changes.
 - **Modify**: Allows users and groups to configure and modify the data required for Analytics. This setting also includes View permission. Users are also able to set schedule for publishing data for various areas in Unifier to Oracle Analytics Server. The View option must be selected for the users with Modify permissions.
 - c. Click **OK**.
- 8) Click **Apply** to save changes and keep the window open or click **OK** to save changes and close the window.

Note: The **Permissions** tab enables access to permission templates. You can copy a permission template to quickly set up the permissions for a new user or group. You can also save an existing user or group's permission settings as a new template for later use.

Additional Configurations

This chapter describes additional configurations that may be needed as part of the installation, configuration, and execution of Primavera Data Warehouse.

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Configuring Secure Sockets Layers (SSL)

The following topics describe how to connect the Primavera Data Warehouse software to the Primavera Data Warehouse schema using Secure Sockets Layers (SSL). SSL ensures a secure connection between servers over the network.

Installing and Configuring Financial Periods

Primavera Data Warehouse can use two additional financial periods.

Note: You must have previously run the STARETL process.

To add the additional financial periods to your Primavera Data Warehouse:

- 1) Sign in to the Primavera Data Warehouse database instance as the schema owner. For example, the STARUSER account.
- 2) Run a query to set the values for fin_period_2 and fin_period_3.
For example:

```
update w_day_d set fin_period_2 = CHR(64 + cal_month)||'-'||cal_year;  
update w_day_d set fin_period_3 = CHR(64 + cal_month)||'-'||cal_year;
```


Enter these queries as one line.
- 3) Commit these changes.
- 4) Run the STARETL process.

Including Inactive Resources from P6 EPPM in the Primavera Data Warehouse Tables

By default, the Primavera Data Warehouse tables filter out inactive resources. If you include inactive resources, the spread data and other dimension tables will also include them. You may not need to process this extra resource assignment information.

If you want to include inactive resources in the Primavera Data Warehouse tables and have deployed Primavera Analytics Administration Application, see ***Customizing STARETL Process Runs for a Data Source*** (on page 61).

If you are not using Primavera Analytics Administration Application:

- 1) Log in to the Primavera Data Warehouse database instance as the schema owner. For example, the STARUSER account.
- 2) Use the following statement to change the setting for inactive resources in the ETL_PARAMETER table:

```
update etl_parameter
set p_1 = 'true'
where p_feature = 'star.utilization.include.active.rsrc'
and datasource_id = 1;
commit;
```

Configuring Advanced Security Features

This chapter describes how to set up advanced security in Primavera Data Warehouse.

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Transparent Data Encryption (TDE)

Transparent Data Encryption (TDE) is an Oracle Advanced Security feature that is used for Oracle Database encryption. TDE provides strong protection from malicious access to database files by encrypting data before it is written to storage, decrypting data when being read from storage, and offering built-in key management.

For TDE implementation instructions, refer to the **readme.txt** file in the P6 EPPM physical media or download at `database\scripts\common\tde`.

For more information about TDE, refer to the **Oracle Advanced Security Guide**.

<https://docs.oracle.com/en/database/oracle/oracle-database/19/asoag/index.html>

To start using TDE, you must create a wallet and set a master key. The wallet can be the default database wallet shared with other Oracle Database components or a separate wallet specifically used by TDE. In an effort to exercise these security practices, Oracle strongly recommends using a separate wallet to store the master encryption key.

Specifying a Wallet Location

If you choose to use a wallet specifically for TDE, specify a wallet location in the `sqlnet.ora` file by using the `ENCRYPTION_WALLET_LOCATION` parameter. The wallet location specified by this file and parameter is used to create the master encryption key. If the `ENCRYPTION_WALLET_LOCATION` parameter is not present in the `sqlnet.ora` file, then the `WALLET_LOCATION` value is used. A new wallet is created if one does not exist already.

If no wallet location is specified in the `sqlnet.ora` file, then the default database wallet location, `ORACLE_BASE/admin/DB_UNIQUE_NAME/wallet` or `ORACLE_HOME/admin/DB_UNIQUE_NAME/wallet`, is used. Here, `DB_UNIQUE_NAME` is the unique name of the database specified in the initialization parameter file.

If an existing auto-login wallet is present at the expected wallet location, then a new wallet is not created.

Setting the Master Encryption Key

Before you can encrypt or decrypt database columns or tablespaces, you must generate a master encryption key.

Opening the Encrypted Wallet

The database must load the master encryption key into memory before it can encrypt or decrypt columns/tablespaces. Opening the wallet allows the database to access the master encryption key. Once the wallet has been opened, it remains open until you shut down the database instance or close it explicitly.

Encrypting Tablespaces

TDE tablespace encryption encrypts and decrypts data during read/write operations.

To create an encrypted tablespace, run the following:

CREATE

```
[ BIGFILE | SMALLFILE ]
{ permanent_tablespace_clause
| temporary_tablespace_clause
| undo_tablespace_clause
} ;
```

where

permanent_tablespace_clause=

TABLESPACE tablespace

.....

ENCRYPTION [USING algorithm]

.....

storage_clause

.....

where

storage_clause=

.....

[ENCRYPT]

.....

For example:

```
CREATE TABLESPACE securespace
```

```
DATAFILE '/home/user/oradata/secure01.dbf'
```

```
SIZE 150M
```

```
ENCRYPTION USING 'AES128'
```

```
DEFAULT STORAGE(ENCRYPT);
```

Note: An existing tablespace cannot be encrypted; however, you can import data into an encrypted tablespace using the Oracle Data Pump utility.

The keystore is container-level and keys can be separate for pdbs. To configuring a keystore, complete the following steps:

- 1) Set the location of the wallet in sqlnet.ora.
- 2) After logging into the database with SYSDBA or at least SYSKM role, create a password protected wallet:

```
SQL> administer key management create keystore
'/PATH/TO/ORACLE/WALLET/DIR' identified by tdecdb;
```
- 3) Open the keystore.

```
SQL> administer key management set keystore open identified by tdecdb
container=all;
```
- 4) With the wallet open, a TDE key can be created. For multitenant environments, a TDE key can be used by all PDBs or each PDB can have a dedicated TDE key.

```
SQL> administer key management set key using tag 'cdb_shared' identified
by tdecdb with backup using '/tmp/wallet.bak' container=all;
```
- 5) Create encrypted tablespaces:

```
CREATE SMALLFILE TABLESPACE STAR_DAT1 DATAFILE 'star_dat1.dbf' SIZE 100M
AUTOEXTEND ON NEXT 10M MAXSIZE UNLIMITED LOGGING EXTENT MANAGEMENT LOCAL
UNIFORM SIZE 1M SEGMENT SPACE MANAGEMENT AUTO
      ENCRYPTION USING 'AES128'
      DEFAULT STORAGE(ENCRYPT);

CREATE SMALLFILE TABLESPACE STAR_HST1 DATAFILE
      'star_hst1.dbf' SIZE 10M AUTOEXTEND ON NEXT 100M MAXSIZE
UNLIMITED LOGGING EXTENT MANAGEMENT LOCAL UNIFORM SIZE 1M SEGMENT SPACE
MANAGEMENT AUTO
      ENCRYPTION USING 'AES128'
      DEFAULT STORAGE(ENCRYPT);
```

Applying TDE to an Existing Star Schema

An existing tablespace cannot be encrypted. To apply TDE to an existing Star schema:

- 1) Create tablespaces that are encrypted. For more information, see ***Encrypting Tablespaces*** (on page 78).
- 2) Move data from existing tablespaces to the new ones using table redefinition. The files that are used are preferences.txt, grants_before_tde.sql, migrate.sql, and grants_after_tde.sql.
 - a. Edit the preferences.txt file so that it matches your environment and security requirements:

```
alg varchar2(7 char) NOT NULL := 'AES128';
owner varchar2(30 char) NOT NULL := 'STARUSER';
source_dir varchar2(128 char) NOT NULL := '/u01/opt/oradata/orcl/';
```

```
target_dir varchar2(128 char) NOT NULL := '/u02/opt/oradata/orcl/';
```

- 3) Replace 'STARUSER' with the user name applicable to your environment.

Note:

- source_dir is the folder that contains the current clear text application tablespaces.
 - Target_dir can point to the same or another folder or partition which allows you to relocate the encrypted tablespaces.
 - grants_before_tde.sql grant the required privileges to STARUSER (change STARUSER to your schema user in case it is different). Run the script as sys user.
 - migrate.sql migrates all objects in the given clear text tablespace into its encrypted counterpart. Run this script from command prompt for both Star_Dat1 and Star_Hst1 tablespaces as staruser.
 - migrate_tables_part.sql migrates the remaining tables that have row level security enabled. Run this script as staruser and post migrate.sql finishes.
 - grants_after_tde.sql will revoke all the privileges that were provided to staruser for creating and migrating data to encrypted tablespaces. Run the script as sys user.
-

Post-Migration Steps

Once the migration of all tablespaces is complete, manually complete the following steps:

- 1) Rename all tablespaces and take the clear text tablespaces offline (as 'STARUSER'):

```
alter tablespace STAR_DAT1 rename to STAR_DAT1_backup;  
alter tablespace STAR_DAT1_ENC rename to STAR_DAT1;  
alter tablespace STAR_DAT1_backup offline normal;  
alter tablespace STAR_HST1 rename to STAR_HST1_backup;  
alter tablespace STAR_HST1_ENC rename to STAR_HST1;  
alter tablespace STAR_HST1_backup offline normal;
```

- 2) After confirming that the ETL process and Oracle Analytics Server reports runs seamlessly off encrypted tablespaces, the original clear-text tablespaces can now be deleted:

```
drop tablespace STAR_DAT1_backup including contents and datafiles;  
drop tablespace STAR_HST1_backup including contents and datafiles;
```

- 3) Log in as sysdba and run grants_after_tde.sql.

Troubleshooting Common Errors

Primavera Data Warehouse writes detailed process information to the log files. The Logs contain information about the installation, as well as about each run of the STARETL process. If an error occurs, the log files may include diagnostic information. Analyzing these files can help lead you to the resolution or to the file or process that caused the error.

Cannot auto-create wallet (ORA-28368)

If you encounter the above error while running the following line:

```
ALTER SYSTEM SET ENCRYPTION KEY IDENTIFIED BY "admin";
```

- ▶ Make sure the folder where you want your encryption keys to be placed exists.
- ▶ If it is not already created, create one and re-run the above line.

Encryption wallet, auto login wallet, or HSM is already open (ORA-28354)

If you encounter the above error, run:

```
alter system set encryption wallet close identified by "<password>";
```

then

```
alter system set encryption wallet open identified by "<password>";
```

TNS: wallet open failed (ORA-12578)

- ▶ Check the `sqlnet.ora` file for any extra spaces before the `WALLET_LOCATION` line.
- ▶ Make sure you have not missed any parenthesis.
- ▶ If the above 2 do not work, edit your `sqlnet.ora` file and modify `SQLNET.WALLET_OVERRIDE` parameter value from `TRUE` to `FALSE`.

Auto login wallet not open but encryption wallet may be open (ORA-28390)

If you encounter the above error while trying to close the wallet with `alter system set encryption wallet close`, correct the statement to:

```
alter system set encryption wallet close identified by "<password>";
```

AES Customer-Supplied Encryption

Advanced Encryption Standard (AES) is an encryption tool used to encrypt and decrypt text using an AES encryption algorithm. With this customer-supplied encryption, passwords for all schema required to move data from Primavera databases into the Primavera Data Warehouse will be encrypted.

Configuring AES and Primavera Data Warehouse

Before running configStar, complete the following steps to create the keystores and configure them for use with Primavera Data Warehouse:

Note: If there is no need of keystores, ignore this procedure and the passwords will be encrypted as AE04.

- 1) Open a command prompt/terminal window and navigate to **<PDW Install Folder>\star\config folder**.

- 2) Run the following command:

```
java -classpath lib/prm-common.jar com.primavera.common.KeyStoreInstaller  
-createnew.
```

- 3) When prompted, enter a password for the keystore.
- 4) Open a command prompt/terminal window and navigate to **<PDW Install Folder>\star\config folder**.
- 5) Run the configStar.cmd (with Windows) or configStar.sh (with UNIX or Linux) to create a new staretl source.
- 6) After configuring the new staretl source, perform the following steps to access the keystore:
 - a. Copy the created keystore files (p6keystore.jks and p6kspass.pwf) located in **/star/config folder to etl_homes/staretlX/** where x is the number of the ETL source.
 - b. Change the keystore:
 1. Open **p6kspass.pwd** and delete its content.
 2. Enter the password that has been used to generate the keystore in this file in clear text.

Note: Be careful not to introduce new spaces or lines.

3. Save and exit.
4. After the first ETL run, the process will encrypt the password.
- c. Regenerate the password
 1. Go to the **staretl** folder.
 2. Regenerate the password (use the password as used to create the keystore)

```
java -classpath lib/prm-common.jar com.primavera.common.KeyStoreInstaller  
-genpassfile
```

- 7) In the WebApp section:
 - a. Change bin/startWeblogic.sh to specify the location of primavera.bootstrap.home (line 99)

```
JAVA_OPTIONS="${SAVE_JAVA_OPTIONS}  
-Dprimavera.bootstrap.home=/home/g/staretl-cloud/config"
```

Upgrading to the Latest Version

This section describes how to upgrade to Primavera Data Warehouse Version 24.

To upgrade to Version 24, use the following table to determine your upgrade path:

Current Version	Upgrade to
Primavera Data Warehouse 23.12	Primavera Data Warehouse 24.12
Primavera Data Warehouse 22.12	Primavera Data Warehouse 24.12
Primavera Data Warehouse 21.12	Primavera Data Warehouse 23.12 and then upgrade to Primavera Data Warehouse 24.12

Upgrade Procedure

The basic upgrading process is as follows:

- 1) Back up all files that will be impacted by the upgrade, including the following:
 - ▶ Database schema for Primavera Data Warehouse
 - ▶ Installation folder for Primavera Data Warehouse or P6 Reporting Database.
- 2) Review the *Tested Configurations* document to confirm that the versions of all related components (including Oracle Database, Java, and so on) are supported. If needed, upgrade components to supported versions before proceeding.
- 3) Install the Primavera Data Warehouse database in a new folder. For details, see ***Installing Primavera Data Warehouse Software*** (on page 25).

Note: Do not install Primavera Data Warehouse Version 24 in the same folder where you installed a previous version of Primavera Data Warehouse or the P6 Reporting Database.

- 4) Configure the Primavera Data Warehouse database. For details, see ***Configuring Primavera Data Warehouse*** (on page 27).

-
- **Notes:**
 - Refer to your existing schema when you use the configuration utility.
 - During configuration, ensure to reselect all required codes and UDFs.
-

- 5) Upgrade the Primavera Data Warehouse schema. For details, see ***Upgrading the Primavera Data Warehouse Schema Only*** (on page 84).

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Upgrading the Primavera Data Warehouse Schema Only

After installing and configuring Primavera Data Warehouse Version 24, you must update the Primavera Data Warehouse schema to the latest version before running the SETUP process or the STARETL process.

To upgrade the schema from Primavera Data Warehouse 22.12 or higher to the current version:

- 1) Go to the Oracle Software Delivery Cloud.
- 2) Download PrimaveraDataWarehouse.zip and extract the contents.
A star directory is created with three folders:
 - ▶ Config
 - ▶ app
 - ▶ etl_homes
- 3) Change the permissions to run the configuration scripts.
`cd <PDW>/star/config`
`chmod 775 *`
- 4) Launch the script with the path to the environments jre within the used JDK.
`./dwInstaller.sh <java_home>`
- 5) Go to the **<PDW Install Folder>\star\config\silent** folder.
- 6) Copy and edit the following template property files to conform to your environment:
 - ▶ odi.global.properties.templates
 - ▶ odi.p6.local.properties.templates
 - ▶ odi.unifier.local.properties.templates
 - ▶ odi.textura.local.properties.templates
- 7) Save the properties files.
- 8) Run the silent installation command with a “-u” parameter as follows:
`./globalSilent.sh odi.global.properties -u`
or
Use the configuration utility to upgrade the star schema as follows:
 - a. Go to the **<PDW Install Folder>/star/config** folder.
 - b. Launch the configuration utility:
Windows Installations: Run **configStar.cmd**
UNIX or Linux installations: Run **configStar.sh**
 - c. Review the current connections and settings in each step of the upgrade sequence.

- d. In the final **Data Warehouse Creation** step, click on the **Upgrade** button.
- e. In the ETL Management screen, click the **Add** button.
- f. Navigate through all screens of adding a P6 / Unifier data source and then click the **Finish** button.

Depending on the existing data sources in the lower version of Primavera Data Warehouse, also run:

- ▶ `./etlSilent.sh odi.global.properties odi.p6.local.properties`
- ▶ `./etlSilent.sh odi.global.properties odi.unifier.local.properties`

-
- **Notes:**
 - You must run the schemaUpgrade process from **<PDW Install Folder>\star\etl_homes\staretl1\scripts**. If you run it from any other folder, an error occurs.
 - If an existing ODI environment is already started, then for the Oracle DI Agent and Server run:
 - StopNodeManager
 - StopWeblogic
 - If using Primavera Analytics Web Administration Application, run:
 - StopWeblogic. Now the source schema upgrade can be completed.
 - After source schema upgrade is completed then run the Data Warehouse and Analytics upgrades.
 - After Primavera Data Warehouse and Analytics upgrades, for the Oracle DI Agent and Server, run:
 - StartNodeManager
 - StartWeblogic
 - For Primavera Analytics Web Administration Application:
 - StartWeblogic
-

At this point, with Primavera Data Warehouse Version 24 installed and the Primavera Data Warehouse schema upgraded to the current version, you can now either run the STARETL process manually or let your normally scheduled STARETL process occur. For details on running the STARETL process manually, see ***Running the STARETL Process for Traditional Data Warehouse Installations*** (on page 37).

Configuring the SSL Connection

If you are configuring the SSL connection, Oracle assumes that you understand the concept of wallets and the (SSL) functionality.

Use My Oracle Support's Knowledge article: *762286.1: End to End Examples of using SSL with Oracle's JDBC THIN Driver*. This article provides examples of the following:

- ▶ Creating a self-signed Oracle wallet for the server and client.
- ▶ Configuring the database to use TCPS with the server key.
- ▶ Configuring a SQL client to connect through the TCPS protocol.

- ▶ Creating simple java clients that show how to connect through TCPS in several different examples.

Use the example in the article to guide you in creating your SSL connection.

Configuring Primavera Data Warehouse to Use SSL to run the STARETL Process

The configuration utility does not allow the STARETL properties files to be directly configured for TCPS. After it is initially configured for TCP and after the SSL connection is configured, you must manually configure each data source in Primavera Data Warehouse so that SSL is used to run the STARETL process.

For each data source, complete the following steps:

- 1) Sign in to Primavera Data Warehouse database instance as the schema owner. For example, the STARUSER account.
- 2) Update the ETL_PARAMETER table setting for the source tns connection information:

```
update etl_parameter
set p_1 =
'(DESCRIPTION=(ADDRESS=(PROTOCOL=TCPS)(HOST=<HOST>)(PORT=<SSL_PORT>))
(CONNECT_DATA=(SERVICE_NAME=<SERVICE_NAME>)))'
where p_feature = 'db.pmdb.tns'
and datasource_id = 1;
commit;
where,
```
- 3) <HOST>: P6 EPPM or Primavera Unifier source database server
<SSL_PORT>: Default SSL port
<SERVICE_NAME>: Service name for the P6 EPPM or Primavera Unifier source database instance
- 4) Update the ETL_PARAMETER table setting for the data warehouse tns connection information:

```
update etl_parameter
set p_1 =
'(DESCRIPTION=(ADDRESS=(PROTOCOL=TCPS)(HOST=<HOST>)(PORT=<SSL_PORT>))
(CONNECT_DATA=(SERVICE_NAME=<SERVICE_NAME>)))'
where p_feature = 'db.star.tns'
and datasource_id = 1;
commit;
where,
```

<HOST>: Primavera Data Warehouse database server
<SSL_PORT>: Default SSL port
<SERVICE_NAME>: Service name for the Primavera Data Warehouse database instance
- 5) If you are not using Oracle Data Integrator (ODI), complete the following steps:
 - a. Go to **<PDW Install Folder>\starletl_homes\staretl<id>**.

- b. Edit **staretl.bat** (with Windows) or **staretl.sh** (with UNIX or Linux).
- c. Add the following variable to the first line of the file:

With Windows:

```
SET PRM_SSL_CONNECTION=Y
```

With UNIX or Linux:

```
EXPORT PRM_SSL_CONNECTION=Y
```

Note: If you are using WebLogic and Primavera Analytics Web Administration Application, you can set this as a system variable in WebLogic instead. Oracle recommends this option if using WebLogic. For more details, see WebLogic documentation.

Upgrading ODI

Depending on your current version (22.12 or later), complete the following steps to upgrade ODI:

Note: Ensure you use an existing star user to configure the 24.12 version.

- 1) Go to **<PDW Install Folder>\star\config\odi** folder.
- 2) Run the following scripts:
(Windows): `odiUpgrade.cmd`
(Linux or Unix): `odiUpgrade.sh`
- 3) Sign in to Primavera Analytics Web Administration application.
- 4) Run the ETL for the star user configured for the upgraded ODI.

Uninstalling Primavera Data Warehouse

To uninstall Primavera Data Warehouse delete Primavera Data Warehouse installation folder and all of its subfolders from the physical location.

Primavera Data Warehouse Troubleshooting

Primavera Data Warehouse writes detailed process information to the log files. The logs contain information about installation and each run of the STARETL process. If an error occurs, the log files may include diagnostic information. Analyzing these files can help lead you to the resolution or to the file or process that caused the error.

Workaround to Drop the ODI Master/Work Repo and Create a Master/Work Repo

To drop the odi master/work repo and create a master/work repo:

- 1) Stop the ODI javaee agent server to close database connection to ODI repo.
- 2) Go to **<ORACLE_HOME>/oracle_common/bin** folder.
- 3) Run the rcu.
 - ▶ Select **Drop Repository**, and drop **Oracle Data Integrator / Master and Work Repository** only.
 - ▶ Uncheck all other schemas under **AS Common Schemas**.
- 4) Run the rcu again.
- 5) Select **"Create Repository / System Load and Product Load"**.
- 6) In the Schemas page, select **Select existing prefix** and then check **"Oracle Data Integrator / Master and Work Repository"**.
- 7) After completing the rcu, run **removeOdiObjects** and **odilImport**.
- 8) Use ODI studio to provide the password for each data server.
- 9) Restart the ODI javaee agent server.
- 10) Sign in to the web app to start the real time load plans.
Scheduled daily runs should run as scheduled.

Workarounds for Solaris Installations

For Solaris installations, use the following workarounds:

- 1) To resolve the error when running the script from **\config\odi** folder as part of the configuration process:
 - a. Open `/config/setenv.sh` in a text editor
 - b. Find the line `export CONFIG_HOME="$( cd "$( dirname "${BASH_SOURCE[0]}" )" && pwd )"`
 - c. Replace that with below code

```
export CONFIG_HOME="$( cd "$( dirname "${BASH_SOURCE[0]}" )" && pwd )"
if echo "$CONFIG_HOME" | grep -q "/config/odi" ; then
    export CONFIG_HOME=$CONFIG_HOME/..
fi
```
- 2) If you are unable to launch ODI studio in Solaris:
 - a. Open the `odi.sh` in a text editor

- b. Find the line `sh ./odi`
- c. Change that to `bash ./odi` and save.
- d. Launch and run the `./odi.sh` from bash.

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ETL and Primavera Data Warehouse Query Performance

Primavera Data Warehouse has default schema hints that are added based on sample data. The hints aim to improve performance across all data sets. To further improve performance, you can add non-default schema hints to Primavera Data Warehouse. You should investigate adding non-default hints if you see bottlenecks in query performance or when you run the STARETL process on your data set.