

Oracle® Primavera P6™ Reporting Database

User's Guide

Version 6.2.1

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Preface

In this preface

[Using the P6 Reporting Database Users Guide](#)

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The Oracle Primavera P6 Reporting Database application enables customers to generate two types of databases that can be used to extract and transform data from the Project Management database. This data can then be used create reports via third party reporting products. The two types of databases are the Operational Data Store (ODS) and the Star Schema Database (Star).

Using the P6 Reporting Database Users Guide

This guide explains how to use ODS and Star with the Project Management module to extract data for use in creating reports through a third-party reporting tool. This guide is organized as follows:

Part 1: P6 Reporting Database Overview Provides an overview of the Enterprise Reporting system, ODS, Star, and the Extract, Transform, and Load (ETL) process.

Part 2: P6 Reporting Database Describes the ODS and Star databases that comprise the P6 Reporting Database.

P6 Reporting Database Documentation

You can access documentation supporting the P6 Reporting Database application from the Documentation directory in the physical media or download location. Double-click the applicable PDF file to view the information using Adobe Acrobat Reader. The following table describes the available documents.

Title	Description
<i>Oracle Primavera P6 Reporting Database Administrator's Guide</i>	<i>Explains how to install and configure the P6 Reporting Database application, and how to generate ODS and Star databases.</i>
<i>Oracle Primavera P6 Reporting Database User's Guide</i>	<i>Explains how to use ODS and Star with the Project Management module to extract data that can be used to create reports through a third-party reporting tool.</i>

Contacting Customer Support

If you have a question about using Oracle Primavera products that you or your network administrator cannot resolve with information in the documentation or Help, contact Customer Support.

For instructions on how to submit a service request for technical support for your products, go to <http://www.oracle.com/primavera/support.html>. This page provides the latest information for contacting support and the support renewals process.

P6 Reporting Database Overview

In this part

[Overview](#)

Read this part to learn more about the P6 Reporting Database application.

Overview provides an overview of the P6 Reporting Database application.

Overview

In this chapter

Overview of P6 Reporting Database

ETL Data Process Details

Scheduling Overview

Appending New Snapshots to the Star Database

Date Ranges

Dimensions

Calculated Fields

This section provides a general overview of the P6 Reporting Database application, including the Operational Data Store (ODS) and the Star Schema (Star), and the ETL (Extract, Transform, Load) process.

Overview of P6 Reporting Database

P6 Reporting Database application works with the Oracle Primavera Project Management module to provide a robust and powerful reporting solution. Besides the analytical tools already provided with the Project Management module, P6 Reporting Databases enable customers to use third-party reporting tools to create the following types of reports for portfolios and projects:

- Day-to-day operational reports using the Operational Data Store (ODS)
- Business intelligence analysis using the Star Schema (Star).

ODS The ODS portion of the P6 Reporting Database application is a relational database that supplies day-to-day, easy to understand operational views of the Project Management database.

Persisting and transforming all of the data found in the Project Management database enables customers to create unique reports on any project or portfolio. The ODS provides the most granular view of the Project Management database. It applies API formulas for many types of calculated data that otherwise would not be visible in the Project Management database (for example, percent complete, variances, earned value, and WBS spreads). In order to protect data access, defined users receive the same access to data in the ODS as they do in the Project Management module.

Star The Star enables an organization to perform advanced business analysis on project and portfolio data. It supplies a dimensional schema that organizes Project Management database data into hierarchical relationships. With Star, the data can be grouped according to project.

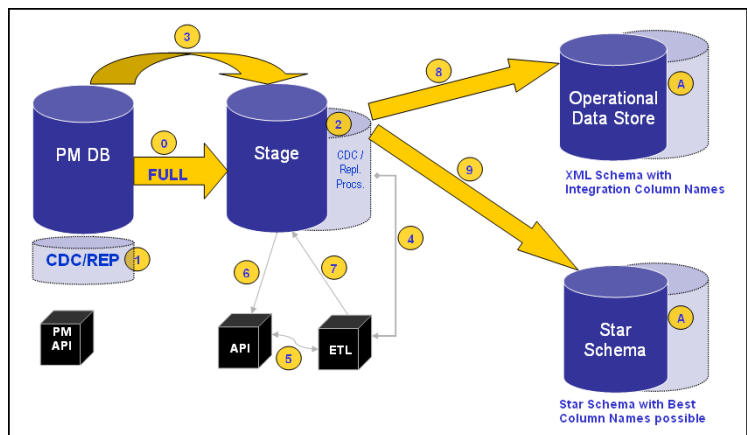
The Star Schema design enables the highest level of query efficiency and flexibility in data analysis. The Star database is designed to accumulate project data over time. These historical “snapshots” provide organizations with baselines for tracking trends and for advanced business intelligence.

Extract, Transform, Load (ETL) process An ETL process provides data movement between the Project Management database and the ODS and Star reporting databases. Project Management database data is extracted, calculations applied in a staging area, and the data is loaded into the ODS and Star databases. ETL scheduling provides cyclical refresh capabilities down to the day, and an on-demand refresh capability for real-time data freshness. The ETL process requires an intermediate staging database to perform calculations before delivering the data to the ODS and Star databases.

The ETL process:

- Ensures that data is optimized for analytical reporting
- Fulfills the schedule refresh window
- Accommodates on-demand refreshes
- Implements application security

The following figure illustrates the ETL process:



In the preceding figure, PM DB stands for Project Management database. The following table describes the process associated with each number in the preceding process diagram.

Number	Description
0	Using the database utilities, an exact copy of the data is made (Full Refresh), and the Stage schema is populated. This is a one-time copy that is run during the initial installation. A full ETL process can also be run after the system has been installed and run.
1	The Project Management database uses CDC change tables (for Oracle) or Replication Tables and Logs (for , Server) to keep track of changes made to Project Management database. This collects changes to the data without reading the application tables, and without causing locking or other database resource contention delays.
2	The Stage schema has additional columns to hold denormalized and persisted calculated Project Management database fields. During the full or incremental ETL process, a combination of direct SQL statements and the Integration API is used to populate the denormalized and persisted calculated Project Management database fields.
3	This is the incremental refresh path. It only loads the changes that have occurred since the last the ETL process ran. These processes will be the same as for the on-demand process.
4	Numbers 5 through 9 in this table outline the incremental refresh ETL process.
5	In this section of the incremental refresh, the ETL process sends requests to the API for only the virtual fields that must be initially stored or updated as a result of the Incremental ETL process.
6	The P6 Reporting Database Integration API is a modified version of the Project Management Integration API. This API interacts with the Stage schema to produce requested virtual data fields. These virtual fields must be refreshed when underlying record data has changed.
7	The ETL process connects via JDBC, and uses prepared statements and direct SQL statements to further expedite the process and update the virtual and denormalized fields in the Stage schema.

Number Description

8	The Distribution process moves the processed data from the Stage schema to the ODS schema.
9	The Distribution process moves the processed data from the Stage schema to the Star schema.
A	Both ODS and Star perform any aggregation or other data structuring to support the reporting and analytical queries. The ODS maintains the similar security as the application. The security being maintained consists of Project/Cost security, Resource security, and Super User security. See the “ODS Security” chapter of this Guide for more information.

ETL Data Process Details

Scheduled Versus On-Demand The ETL process can be scheduled to run at certain times, or can be run on-demand by an administrator.

Stage to ODS Replication The ETL process runs when scheduled. The agent runs the incremental replication to the Stage database, and then calls the ETL process to process the information into the persisted virtual and denormalized fields.

The ETL process runs when scheduled. It launches the P6 Reporting Database Integration API to drive the calculation for those records whose underlying data has changed since the prior ETL process execution. When the API's usage has completed, stored procedures are called that perform the transformation processing (for example, calendar calculation and hierarchical referencing). When the transformation processing completes, replication to the ODS database and Star database occurs.

Scheduling Overview

Once the ODS (and optionally Star) databases are fully installed, you will decide when and how often these databases should be updated from the Project Management database. These updates will be performed in an incremental fashion. This means that only the data that has changed in the Project Management database since the last ETL process will be transferred. The process for updating the ODS and Star databases can be launched in the following ways:

For information on scheduling the database update, see the P6 Reporting Database Administrator's Guide.

For information on manually launching the database update, see the P6 Reporting Database Administrator's Guide.

- Manually when required
- Scheduled to occur exactly once sometime in the future
- Scheduled to recur during regular intervals

The script that launches the ETL process is:

- incremental.bat for Microsoft SQL Server or for Oracle on a Windows platform
- incremental.sh for Oracle on a non-Windows platform

Depending on your platform, the incremental.bat or incremental.sh script resides in the following subfolder of your P6 Reporting Database installation folder:

Platform	Location
Windows	<installation folder>\Reporting Database\scripts
Non-Windows	<installation folder>\erdb\scripts

It is recommended that data refresh be done once every 24 hours during off hours.



Any recurring schedule should be tested first to ensure that there is sufficient time for the process to complete before the next scheduled run of the process. Large data sets may take several hours to refresh. Trying to schedule another run of the process (or trying to run it from the Command Line) before the first refresh completes may cause unexpected results and is not recommended.

Any mechanism can be used to launch or schedule the launch of the Incremental script. The Windows AT command, Task Scheduler, and Unix CRON are all viable options.

Appending New Snapshots to the Star Database

When the ETL process is run, both the ODS and the Star database get updated with the latest data from Project Management database. However, the Star has the ability to retain the data from any previous run of the ETL process, so that multiple sets (snapshots) of data can be accumulated within the Star database. Appending new snapshots is accomplished by running a special script.

For detailed information about appending new snapshots to the Star database, see the *P6 Reporting Database Administrator's Guide*.

Date Ranges

There are several date ranges that must be set up by the Administrator during the installation/configuration of P6 Reporting Database. These ranges affect several date tables that are generated into the ODS and Star.

Full Calendar Date Range The ODS Full Calendar table date range can be selected by start date and end date. The default calendar range starts on January 1st of the previous year and goes until Dec 31st five years from now (for example: 1/1/2007 - 12/31/2012).

Date ranges the ODS Date (REPORT_DATE) and Star Date dimension (D_DATE) can be selected by start date and end date.

Dimensions

Dimensions are a functionality of the Star schema, and describe how a business views and analyzes its data. For example, actual project cost results might be analyzed (or grouped and sorted) by the time dimension (when they were planned or when they were actually incurred), and by the project dimension. The time dimension can also provide comparison (for example, the previous year results versus the current year results). The following dimensions are part of the Star:

- Date
- Time
- Cost Account
- Cost Account Hierarchy
- Enterprise Project Structure (EPS)
- EPS Hierarchy
- Financial Period
- Organizational Breakdown Structure (OBS)
- Project
- Project Code
- Project Code Assignment
- Project Code Hierarchy

Some dimensions are comprised of hierarchies. While dimensions appear only in Star, hierarchies can appear in ODS and Star. Some hierarchies appear in both ODS and in Star, while other hierarchies appear only in ODS.

Hierarchies that appear in both ODS and in Star The following hierarchies appear in both ODS and in Star:

- Project Code
- Cost Account
- EPS

Hierarchies that appear only in ODS The following hierarchies only appear in ODS:

- Activity Code
- Resource Code

Calculated Fields

Calculated fields apply to both ODS and Star. Calculated fields are not stored as physical fields in the Project Management database. These calculations are stored as physical fields in ODS and Star.

Calculated fields are elements that are calculated. For example, the **actual hours** measure shows how many hours each resource charged to a given project or WBS. The Project Management application contains unit (for example: counts, hours, quantity), date, duration, and cost measures.

P6 Reporting Database

In this part

Sample Reports

Operational Data Store (ODS)

ODS Security

Star Schema (Star)

Read this part to learn more about the two databases that comprise the P6 Reporting Database application: Operational Data Store (ODS) and Star Schema (Star)

The *Sample Reports* section describes the sample reports that are included with the P6 Reporting Database application.

The *Operational Data Store (ODS)* section describes the data that is available in ODS. The *Physical Fields from the PM Database*, the *Calculated fields from PM Database*, and the *Denormalized Fields from the PM Database* sections describe the data that is available in the ODS in greater detail. The *ODS Security* section describes the security features of the ODS.

The *Star Schema (Star)* section describes the data that is available in Star. The *Tables in the Star Database* describes the *Star Project Fact Table* and the *Dimension Tables* that comprise the Star database.

Sample Reports

In this chapter

[Sample Reports Overview](#)

[Graphic Reports](#)

[Cross-Tab Reports](#)

This section describes the sample ODS and Star reports that are included with the P6 Reporting Database application.

Sample Reports Overview

The reports\ODS and STAR directories located in the physical media or download location contain sample reports that were created using the P6 Reporting Database application. These reports are included in a PDF format and were created by running the Crystal Reports RPT files (also included) against a Primavera Reporting ODS or Star database. Additionally, these directories contain related sample SQL queries in .txt files.

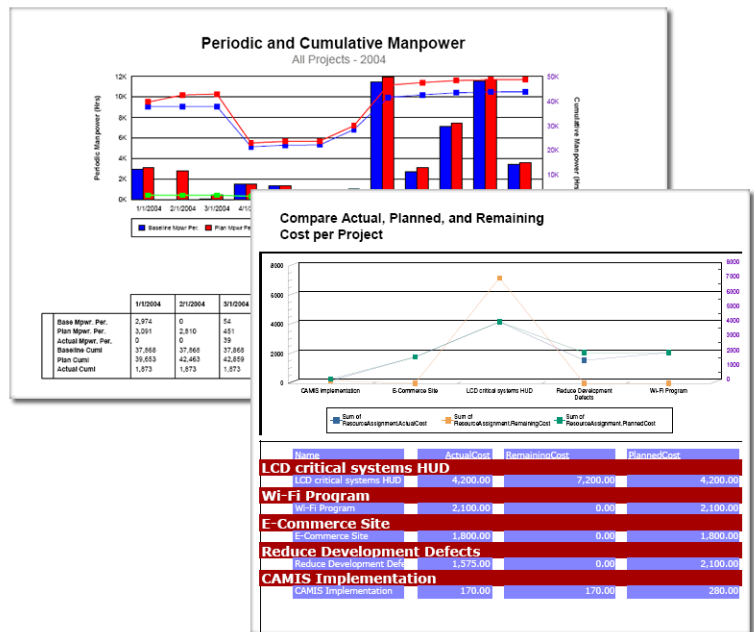
The reports subdirectories contain two types of reports:

- Graphic reports
- Cross-tab reports

Graphic Reports

The Graphic sample reports present the data in one of four ways:

- 1 Line Graph reports that present the project data in the form of intervals of data connected lines.
- 2 Histogram reports that present the project data in the form of bars in which there are no spaces between the bars.
- 3 Bar Graph reports that present the project data in the form of bars that represent discrete groups of data separated by spaces between the bars.
- 4 S-Curve reports that present actual project data plotted against planned data.



Cross-Tab Reports

The Cross-tab sample reports present groups of data in a tabular or grid format that is similar in format to a matrix or spreadsheet. The cross-tab format provides a visual comparison of values from one group against the values in another group.

Status by Priority Code						
Project Data Rollup						
	Finish	Remaining Duration (Weeks)	Remaining Labor (Units)	Activity Count	Risk Level	Current Value Labor (Units)
Must get done		44	44			0
CRM Implementation	10/1/2004 10:17:00AM	44	44	10	Very High	0
Necessary		510	602			14
Financial Systems Integration	7/26/2005 4:00:00PM	200	1147	50	High	0
Asset Inventory - C&G&T	2/1/2005 11:15:00AM	96	42	24	Very Low	0
Asset Inventory - CA	5/10/2005 12:35:00PM	102	42	25	Very Low	0
ERP Maintenance	6/23/2006 4:00:00PM	455	1023	13	High	0
CRM Selection	6/23/2006 4:00:00PM	545	1179	28	High	0
HRM System Upgrade	12/21/2004 3:15:00PM	110	469	32	Low	14
ERP Implementation	6/23/2006 4:00:00PM	455	1737	15	High	0
High Priority		15	60			0
Software License Changes Assessment	12/1/2004 2:00:00PM	15	60	45	Medium	0

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	M1010	5/11/2009 5:00:00PM	
ASSET-Q1-1	Total	5/11/2009 5:00:00PM	
	M1020		
ASSET-Q2	Total		
	M1030		
ASSET-Q3	Total		
	M1040		
ASSET-Q4	Total		8/17/2009 5:00:00PM
			8/17/2009 5:00:00PM

Operational Data Store (ODS)

In this chapter

Fields in the ODS

**Denormalized Fields from the PM
Database**

This section provides an overview of the ODS and the data that it contains.

Fields in the ODS

The Operational Data Store (ODS) portion of the P6 Reporting Database is a relational database that contains the following information from the PM database:

- Physical fields from the PM database
- Calculated fields from the PM database
- Denormalized fields from the PM database (including Hierarchies, Calendars, and Spreads)

Physical Fields from the PM Database

The ODS is a superset of the PM Database: it includes data from the PM database and presents it in a manner that facilitates report creation. Physical fields from the PM database are presented with easy to understand column names. Refer to the `OdsFieldMapTable.html` file located in the physical media or download location for detailed information relating to the fields in the ODS.

Calculated fields from PM Database

Calculated fields that are normally presented in the PM client and Web applications are calculated and stored in the ODS. See the `OdsFieldMapTable.html` file located in the physical media or download location for additional information relating to the calculated fields in the ODS.

Denormalized Fields from the PM Database

By denormalizing the fields from the PM Database, the ODS database is particularly conducive to generating reports, as extensive joins will not be necessary. The following types of fields are denormalized in the ODS:

- Name fields
- Hierarchies
- Calendars
- Spreads

The following sections describe each of these fields. Refer to the ODSFieldMap.xml file located in the physical media or download location for detailed information relating to the fields in the ODS.

Hierarchies

There are several hierarchy tables in ODS and STAR. The purpose of these hierarchy tables is to facilitate many types of roll-up queries. Instead of writing complex recursive or “tree-walking” SQL, users can take advantage of the extra rows and columns in these hierarchy tables and write much simpler queries. The ODS contains the following hierarchy Tables:

- CostAccountHierarchy
- EPSHierarchy
- ProjectCodeHierarchy
- ActivityCodeHierarchy
- ResourceCodeHierarchy

For each hierarchy table, there is a row for every parent-descendant relationship.



Note: This is more extensive than merely a row for every parent-child relationship). There is also a reflexive row for each object (where the object is both parent and child).

Each hierarchy table contains a set of columns for the parent object, and a set of columns for the child object. In addition, there are several metadata columns that contain the number of levels from the top for the parent and child, whether the child has children, etc.

Sample queries that access the ODS hierarchy tables are provided below.

ODS Hierarchy Table Sample Query 1

The following query shows the totals for each EPS node:

```
SELECT FullPathName, ChildId,  
       ChildCurrentBudget, ChildCurrentVariance,  
       ChildOriginalBudget, ChildProposedBudget  
FROM EPSHierarchy  
WHERE ChildObjectId = ParentObjectId  
ORDER BY FullPathName
```

ODS Hierarchy Table Sample Query 2

The following query shows the totals for each EPS node, rolled up to the second level of the EPS hierarchy:

```
SELECT FullPathName, ParentId,  
       sum(ChildCurrentBudget) as ChildCurrentBudget,  
       sum(ChildCurrentVariance) as ChildCurrentVariance,  
       sum(ChildOriginalBudget) as ChildOriginalBudget,  
       sum(ChildProposedBudget) as ChildProposedBudget  
FROM EPSHierarchy  
WHERE ParentLevelsBelowRoot = 2  
AND ParentObjectId = ChildObjectId  
GROUP BY FullPathName, ParentId  
ORDER BY FullPathName
```

ODS Calendar Table

The **Calendar** table in the ODS represents days for which work occurs. There are 3 types of calendars: Global, Resource, and Project.

For each calendar defined in the PM Database, the ODS Calendar table will contain a set of rows representing each distinct day within the Full Calendar Date Range (as defined in the ODS configuration screen). Each row contains the calendar **name** it represents, the calendar **type**, the actual **date** of the day it represents, and a bitmap of work hours.

Since calendars, as defined in the PM database, theoretically continue on forever, it is important that the Administrator set a reasonable range in the Full Calendar Date Range setting when installing the ODS. This defines how much into the future the ODS calendar records will be generated.

ODS Field Name	Data Type	Example Value	Description
<i>ObjectId</i>	<i>integer</i>	<i>566</i>	<i>The unique ID generated by the system.</i>
<i>IsDefault</i>	<i>string</i>	<i>N</i>	<i>The flag that identifies the default global calendar (applies to global calendars only). 'Y' or 'N'</i>
<i>Name</i>	<i>string</i>	<i>Crew4</i>	<i>The name of the calendar.</i>
<i>ProjectObjectId</i>	<i>integer</i>	<i>275</i>	<i>The unique ID of the associated project.</i>
<i>BaseCalendarObjec tId</i>	<i>integer</i>	<i>633</i>	<i>The unique ID of the global calendar to which this calendar is linked. Any changes to the global calendar are automatically propagated to this calendar.</i>
<i>lastchangedate</i>	<i>date</i>	<i>7/6/07 16:46</i>	<i>The date that the calendar was last edited</i>

ODS Field Name	Data Type	Example Value	Description
Type	string	[CA_Rsrc,CA_Base,CA_Project]	The calendar type - either Global ('CA_Base'), Resource ('CA_Rsrc'), or Project ('CA_Project'). Global calendars can be assigned to projects and resources. Resource calendars can be assigned only to resources. Project calendars are specific to projects.
daydate	date	9/20/07 0:00	The actual day that the calendar row represents
WeekdayNumber	integer	5	integer day of week (1-7), Sunday=1 if Sunday is selected as the first day of the week in the Admin Preferences of the Project Management module.
WorkDayFlag	string	Y	Y' or 'N', indicates if this day has work time
TotalWorkHours	double	8	Number of work hours for the day
WorkHoursByHalfHour	string	0000000000 0000001111 1111001111 1111000000 00000000	Bit mask (48 bits) for each half hour of the day, indicating whether the half hour is work time. 0=nonwork time, 1=work time. The first bit represents 00:00-00:30, the second bit represents 00:30-01:00, etc.
WorkDayStartTime	date	9/20/07 8:00	Time of day when work first starts
WorkDayFinishTime	date	9/20/2007 17:00:00 pm	Time of day when work stops
IsBaseline	string	N	Set to 'Y' if this is a project calendar and the project is a baseline project

Spreads

There are three tables in the ODS that contain spread bucket data:

- **EPSSpread**
- **ProjectSpread**
- **WBSSpread**

Each spread table contains 44 spread data columns. Each spread row contains the spread data for a given object (i.e. EPS, project or WBS) for a particular time period. The spread data can be summarized by either a weekly or monthly time bucket. The Spread Bucket Type setting in the ODS configuration determines the granularity of the spreads. If possible, the Spread Bucket Type (weekly or monthly) should match the timescale interval used for bucket planning in the Project Management module.



Note: In order to obtain the latest summary and spread data in ODS, the Summarizer must be run in Project Manager prior to running the incremental ETL.

ODS Security

In this chapter

[ODS Security](#)

[ODS Security Differences](#)

This section provides information about ODS security. The security assigned to an ODS database user is the same as that assigned to the PM user.

ODS Security

User-level security and username restrictions In order for the ODS to properly implement application-level security, a username must conform to the following restrictions:

- It must be 30 or less characters in length.
- It must only consist of alphabetic or numeric characters.
- It must not contain any special characters (such as @ # \$ % , ^ & * . () - + \ / : _ ; | < > , etc.).
- It may not contain any embedded spaces.
- It must start with a letter.
- It must have at least one character.

These restrictions are required because of the way security must be implemented in the ODS.

The ODS has security features that protect project-related data from being viewed and altered by unauthorized parties. The security privileges that the user has in the Project Management database will be the same privileges assigned in ODS.

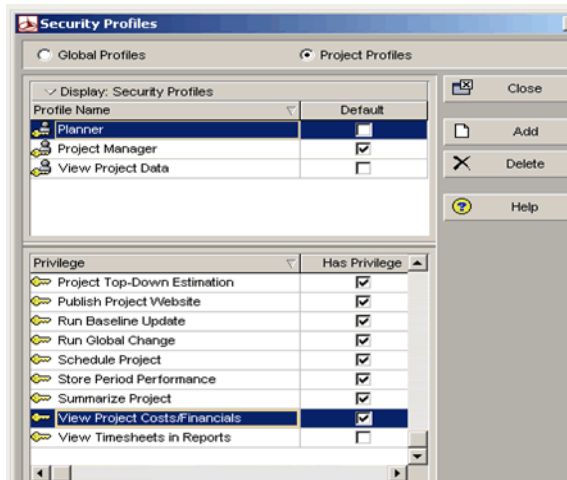
The security in ODS is not as granular as Project Management security. In Project Management, security can be down to the WBS level. In ODS, security is based on the project level. If a user has OBS access to a WBS, or to several WBS below a project, but does not have OBS access to the project, then that user will not have access to the project. For a user to have access to the project, the user must have access on the project level and wbs levels.

The user's PM database password will be ported to ODS. If the user is an application user in PM database, and set as a reporting user (report_user_flag='Y'), a database login for the user will be created in Oracle or Microsoft SQL Server for the ODS database. In contrast, the Star database does not maintain PM application level security.

Modifying user access in the ODS

Users can only see the types of project-related data and resources in ODS to which they have access in PM database. For example, a user's permission to view costs in the ODS is determined by whether their username in Project Management has the "View Project Costs/Financials" privilege. In the ODS, users who do not have this privilege will see the word *null* in place of the value in fields that contain cost information that is restricted by this privilege. Use the following steps to give a user the ability to view cost information.

- 1 In the Project Management application, access the Admin, Security Profiles dialog box.



- 2 To provide access to cost information, ensure that the "View Project Costs/Financials" privilege checkbox is marked in the users project profile.
- 3 There is a global profile privilege that will enable users to view resources costs if the user has resource access. To enable this feature, ensure that the "View Resource and Role Costs" checkbox is marked.
- 4 On the server where Stage is located, run the Incremental.bat script located in the Enterprise Reporting\Scripts directory.

Adding a new user to ODS

Use the following steps to add a new user to the ODS Database:



Note: Step 4 requires DB Administrator's access to the PM database with privileges to modify the PM Users table.

For information on adding a new Project Management user, see the *Project Management Administrator's Guide*, or the *Project Management Online Help*.

- 1 In the Project Management Client application, add a new user in Project Management.
-



The user name that you enter in Step 1 must begin with a letter. It must also conform to the username format restrictions described in "User-level security and username restrictions" on page 40.

- 2 Verify that the new user is created in the PM.
 - 3 On the server where the Project Management database is located, run a query to use the PM database.
 - 4 Run a query similar to the following query to update the Users table
Update Users set report_user_flag = 'Y' where user_name = 'username'
// Replace username with the user name you are adding.
-



Note: When setting this flag when running Oracle, the 'Y' or 'N' must be a capital letter. If the letter is not an upper case letter, the user will not be created.



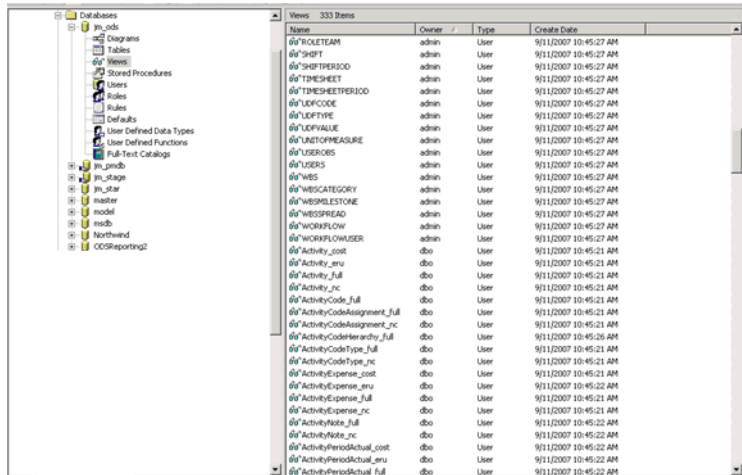
Note: DB Administrator's access to the PM database is required to run the preceding query.



*Note: Running Incremental.bat or Incremental.sh in the following step will update **both** the users and the project data in the ODS.*

- 5 On the machine where the Stage database resides, run one of the following scripts:
 - Incremental.bat (for Microsoft SQL Server or Oracle on a Windows platform)
 - Incremental.sh (for Oracle on a non-Windows platform)

This script is in the \scripts directory you created during the installation of the P6 Reporting Database application. This adds the user to the ODS database. In Microsoft SQL Server, it creates views for the user, and in Oracle it creates synonyms for the user. The user is added to Server Logins.



Name	Owner	Type	Create Date
dwTOILETEAM	admin	User	9/11/2007 10:45:27 AM
dwSHIFT	admin	User	9/11/2007 10:45:27 AM
dwSHIFTPERIOD	admin	User	9/11/2007 10:45:27 AM
dwTIMESHEET	admin	User	9/11/2007 10:45:27 AM
dwTIMESHEETPERIOD	admin	User	9/11/2007 10:45:27 AM
dwUFCODE	admin	User	9/11/2007 10:45:27 AM
dwUFCITY	admin	User	9/11/2007 10:45:27 AM
dwUFCVALUE	admin	User	9/11/2007 10:45:27 AM
dwUNITOFMEASURE	admin	User	9/11/2007 10:45:27 AM
dwUSERS	admin	User	9/11/2007 10:45:27 AM
dwUSERS	admin	User	9/11/2007 10:45:27 AM
dwWBS	admin	User	9/11/2007 10:45:27 AM
dwWBSCATEGORY	admin	User	9/11/2007 10:45:27 AM
dwWBSRESTORE	admin	User	9/11/2007 10:45:27 AM
dwWBSREAD	admin	User	9/11/2007 10:45:27 AM
dwWORKFLOW	admin	User	9/11/2007 10:45:27 AM
dwWORKFLOWUSER	admin	User	9/11/2007 10:45:27 AM
dwActivity_cost	dbo	User	9/11/2007 10:45:21 AM
dwActivity_enu	dbo	User	9/11/2007 10:45:21 AM
dwActivity_full	dbo	User	9/11/2007 10:45:21 AM
dwActivity_nc	dbo	User	9/11/2007 10:45:21 AM
dwActivityCode_full	dbo	User	9/11/2007 10:45:21 AM
dwActivityCodeAssignment_full	dbo	User	9/11/2007 10:45:21 AM
dwActivityCodeAssignment_nc	dbo	User	9/11/2007 10:45:21 AM
dwActivityCodeHierarchy_full	dbo	User	9/11/2007 10:45:21 AM
dwActivityCodeType_full	dbo	User	9/11/2007 10:45:21 AM
dwActivityCodeType_nc	dbo	User	9/11/2007 10:45:21 AM
dwActivityExpense_cost	dbo	User	9/11/2007 10:45:21 AM
dwActivityExpense_enu	dbo	User	9/11/2007 10:45:21 AM
dwActivityExpense_full	dbo	User	9/11/2007 10:45:21 AM
dwActivityExpense_nc	dbo	User	9/11/2007 10:45:21 AM
dwActivityNote_full	dbo	User	9/11/2007 10:45:22 AM
dwActivityNote_nc	dbo	User	9/11/2007 10:45:22 AM
dwActivityPeriodActual_cost	dbo	User	9/11/2007 10:45:22 AM
dwActivityPeriodActual_enu	dbo	User	9/11/2007 10:45:22 AM
dwActivityPeriodActual_full	dbo	User	9/11/2007 10:45:22 AM

Removing a user from Enterprise Reporting

Use the following steps to delete a user from the ODS Database:

- 1 In the Project Management Client application, delete the user.
- 2 Verify user has been deleted from PM database.
- 3 On the machine where the Stage database resides, run one of the following scripts:
 - Incremental.bat (for Microsoft SQL Server or Oracle on a Windows platform)
 - Incremental.sh (for Oracle on a non-Windows platform)

This script is in the Enterprise Reporting\scripts directory. This will remove the user and Views from tables.



Note: The user will still exist as a database user on the server where the ODS is located, but the user will no longer be able to view the PM Database in the ODS.

*Running Incremental.bat in the step above will update **both** the users and the project data in the ODS.*

ODS Security Differences

There is one area where security rules differ slightly from the rules applied to the Project Management databases. This difference is discussed below:

Viewing Cost values within Projects

For the ODS, the user must have the 'View Project Financials' privilege applied to the project level (or any of its parent EPS nodes) in order to see any of the project costs. Applying the 'View Project Financials' privilege to a child WBS node is not sufficient to allow costs to be seen for that WBS-- it must be applied to the project level or above. This is different from the PM client behavior in which cost access can be granted to individual WBS nodes within a project.

Star Schema (Star)

In this chapter

[Star Overview](#)

[Tables in the Star Database](#)

This section provides an overview of the data that is available in the Star Schema (Star) portion of the P6 Reporting Database application.

Star Overview

The Project STAR database is designed as a star schema.

Star Schema Basics

In a typical star schema design, there are fact tables and dimension tables. Each fact table consists of numeric business facts, and foreign keys to the dimension tables, which contain additional attributes. These dimension attributes are usually character-based, and can serve as report labels. Typical queries aggregate numeric facts from many rows of a fact table, and constrain the data in terms of the dimension attributes.

For example, a retail point-of-sale star schema could contain a fact table which tracks each line item sale. This fact table could contain these business facts:

- Number of units sold
- Unit sale price
- Unit cost
- Unit sale discount

In addition, the fact table could contain these foreign keys:

- Date key (points to a Date dimension table, which contains attributes about the day of week, day of month, financial quarter, week, etc.)
- Time of day key (points to a TimeOfDay dimension table)
- Product key (points to a Product dimension table, which contains attributes like the Product name, pack, UPC, weight, size, description, product category, etc.)
- Vendor key (points to a Vendor dimension table, which contains attributes like the vendor name, vendor address, etc.)
- Cashier key (points to an Employee dimension table, which contains attributes like the employee name, Social Security number, date of birth, manager ID, etc.)
- Store key (points to a Store dimension table, which contains attributes like the store name, address, district, manager ID, etc.)
- Promotion key (points to a Promotion dimension table, which contains attributes like the promotion name, promotion type, etc.)

Tables in the Star Database

Star Project Fact Table

The Star database contains one fact table, named F_PROJECTS, which stores data about projects. Unlike many fact tables in other star schemas, the granularity of the data in F_PROJECTS is not at a low level. In particular, there are over 100 summary columns of fact data in each row. Thus, although each row in F_PROJECTS represents one project for one snapshot period, much of the data stored in F_PROJECTS for each project has already been aggregated to some extent.

The Star database contains the following Fact Table:

FACT Table	
<i>F_PROJECTS</i>	<i>Central fact table. Each row represents one project for one snapshot period.</i>

Dimension Tables

The Star database contains the following Dimension tables:

DIMENSION Tables	
<i>D_COST_ACCOUNT</i>	<i>The assigned cost accounts of the projects.</i>
<i>D_COST_ACCOUNT_HIERARCHY</i>	<i>See "Hierarchies" on page 50 for more details.</i>
<i>D_DATE</i>	<i>Dates for project starts and finishes. Does not grow over time as snapshot periods are accumulated.</i>
<i>D_EPS</i>	<i>The EPSes that are assigned to projects.</i>
<i>D_EPS_HIERARCHY</i>	<i>See "Hierarchies" on page 50 for more details.</i>
<i>D_FINANCIAL_PERIOD</i>	<i>The financial periods of the projects.</i>
<i>D_OBS</i>	<i>The OBSes of the projects</i>
<i>D_PROJECT</i>	<i>The project names of the projects</i>

DIMENSION Tables	
<i>D_PROJECT_CODE</i>	<i>The project codes of the projects</i>
<i>D_PROJECT_CODE_ASSIGNMENT</i>	<i>Association table of projects and project codes (many-to-many relationship).</i>
<i>D_PROJECT_CODE_HIERARCHY</i>	<i>See “Hierarchies” on page 50 for more details.</i>
<i>D_TIME</i>	<i>Does not grow over time as snapshot periods are accumulated.</i>



Note: In order to obtain the latest project summary data in Star, the Summarizer must be run in Project Manager prior to running the incremental ETL.

Hierarchies

There are several hierarchy tables in ODS and STAR. The purpose of these hierarchy tables is to facilitate many types of roll-up queries. Instead of writing complex recursive or “tree-walking” SQL, users can take advantage of the extra rows and columns in these hierarchy tables and write much simpler queries. Star contains the following hierarchy Tables:

- D_COST_ACCOUNT_HIERARCHY
- D_EPS_HIERARCHY
- D_PROJECT_CODE_HIERARCHY

For each hierarchy table, there is a row for every parent-descendant relationship



Note: This is more extensive than merely a row for every parent-child relationship). There is also a reflexive row for each object (where the object is both parent and child).

Each hierarchy table contains a set of columns for the parent object, and a set of columns for the child object. In addition, there are several metadata columns that contain the number of levels from the top for the parent and child, whether the child has children, etc.

Sample queries that access the Star hierarchy tables are provided below.

Star Hierarchy Table Sample Query 1

The following query shows the totals for each EPS node, rolled up to the second level of the EPS hierarchy, for each snapshot:

```
SELECT FullPathName, ParentId, CurrentProcessCycleDate,
       sum(ChildCurrentBudget) as ChildCurrentBudget,
       sum(ChildCurrentVariance) as ChildCurrentVariance,
       sum(ChildOriginalBudget) as ChildOriginalBudget,
       sum(ChildProposedBudget) as ChildProposedBudget
FROM D_EPS_HIERARCHY
WHERE ParentLevelsBelowRoot = 2
AND ParentObjectId = ChildObjectId
GROUP BY CurrentProcessCycleDate, FullPathName, ParentId
ORDER BY CurrentProcessCycleDate, FullPathName
```

Star Hierarchy Table Sample Query 2

The following query totals a fact column from F_PROJECTS that is rolled up to the second level of the EPS hierarchy for each snapshot:

```
SELECT sum(P.SumEarnedValueByCost) as SumEarnedValueByCost,
       P.CurrentProcessCycleDate,
       EH.ParentId
FROM F_PROJECTS as P,
     D_EPS as E,
     D_EPS_HIERARCHY EH
WHERE P.EPSSKey = E.SKey
      and E.ObjectId = EH.ChildObjectId
      and EH.ParentLevelsBelowRoot = 2
      and P.CurrentProcessCycleDate = E.CurrentProcessCycleDate
      and E.CurrentProcessCycleDate = EH.CurrentProcessCycleDate
group by P.currentprocesscycledate, EH.ParentId
order by P.currentprocesscycledate
```

Snapshot Periods

The Star database has the capability to accumulate historical data. The P6 Reporting Database can be configured to append a new set of rows to each Star table (except D_DATE and D_TIME) at scheduled intervals, or on demand. See the [Scheduling Overview](#) section on page 17 for additional information regarding scheduling. When STAR is installed, and the ETL process is executed, an initial snapshot set of data is inserted into Star.

Each subsequent execution of the ETL process updates the initial snapshot set of data in Star. In order to append a new snapshot set of data to Star (rather than updating the most recent set of data), your Administrator must manually invoke or schedule the process for creating a new Star Snapshot. After the append process is run, the next execution of Incremental ETL will cause a new set of snapshot rows to be appended to STAR.

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