



Oracle Product Lifecycle Analytics

Security Guide

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Preface

The Agile PLM documentation set includes Adobe® Acrobat PDF files. The [Oracle Technology Network \(OTN\) Web site](http://www.oracle.com/technetwork/documentation/agile-085940.html) <http://www.oracle.com/technetwork/documentation/agile-085940.html> contains the latest versions of the Agile PLM PDF files. You can view or download these manuals from the Web site, or you can ask your Agile administrator if there is an Agile PLM Documentation folder available on your network from which you can access the Agile PLM documentation (PDF) files.

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The [Oracle Technology Network \(OTN\) Web site](http://www.oracle.com/technetwork/documentation/agile-085940.html) <http://www.oracle.com/technetwork/documentation/agile-085940.html> can be accessed through **Help > Manuals** in both Agile Web Client and Agile Java Client. If you need additional assistance or information, please contact My Oracle Support (<https://support.oracle.com>) for assistance.

Note Before calling Oracle Support about a problem with an Agile PLM manual, please have the full part number, which is located on the title page.

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Readme

Any last-minute information about Agile PLM can be found in the Readme file on the [Oracle Technology Network \(OTN\) Web site](http://www.oracle.com/technetwork/documentation/agile-085940.html) <http://www.oracle.com/technetwork/documentation/agile-085940.html>

Agile Training Aids

Go to the [Oracle University Web page](http://www.oracle.com/education/chooser/selectcountry_new.html) http://www.oracle.com/education/chooser/selectcountry_new.html for more information on Agile Training offerings.

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Overview

Oracle Product Lifecycle Analytics (Oracle PLA) is a comprehensive, prebuilt Business Intelligence solution that delivers pervasive intelligence and provides key insights into your Product Lifecycle Management (PLM) data. The Oracle PLA application provides an integrated view enabling greater alignment of information across product organizations. Oracle PLA is built on the Oracle Data Integrator (ODI) ETL and Oracle Business Intelligence Enterprise Edition (OBIEE) platforms.

Oracle PLA addresses business use cases specific to these Agile PLM solutions:

- Product Quality Management (PQM)
- Product Collaboration (PC)
- Product Portfolio Management (PPM)
- Agile PLM for Process: New Product Development (NPD)
- Global Specification Management (GSM)

Oracle PLA allows you to use different source systems. Data is transferred from the source systems to the Oracle PLA target analytical data store. In Oracle PLA Release 3.3.1.1.0, the transactional data sources are either Agile PLM 9.x or Agile PLM for Process.

Oracle PLA Architecture Overview

This chapter includes the following:

▪ Database Layer	3
▪ Application Layer	4

You can deploy Oracle Product Lifecycle Analytics (Oracle PLA) various database and application components with different hardware and machine configurations. Depending on the performance criteria set and based on the source (Agile PLM or Agile PLM for Process) database size, volume of data changes in the source database, IT network, infrastructure constraints, and business requirements.

Oracle PLA components are installed under two main layers:

- Database Layer
- Application Layer

Database Layer

The Database layer is distributed across different servers and consists of the following components:

- Source Database
 - Agile PLM Database on Oracle
 - Agile PLM for Process Database on Oracle or SQL Server
- Target Data Mart Database (Oracle Enterprise Database Server only)
 - Staging Schema
 - MDS Schema
- ODI ETL Repositories (Oracle Enterprise Database Server only)
 - ODI Master Repository
 - ODI Work Repository

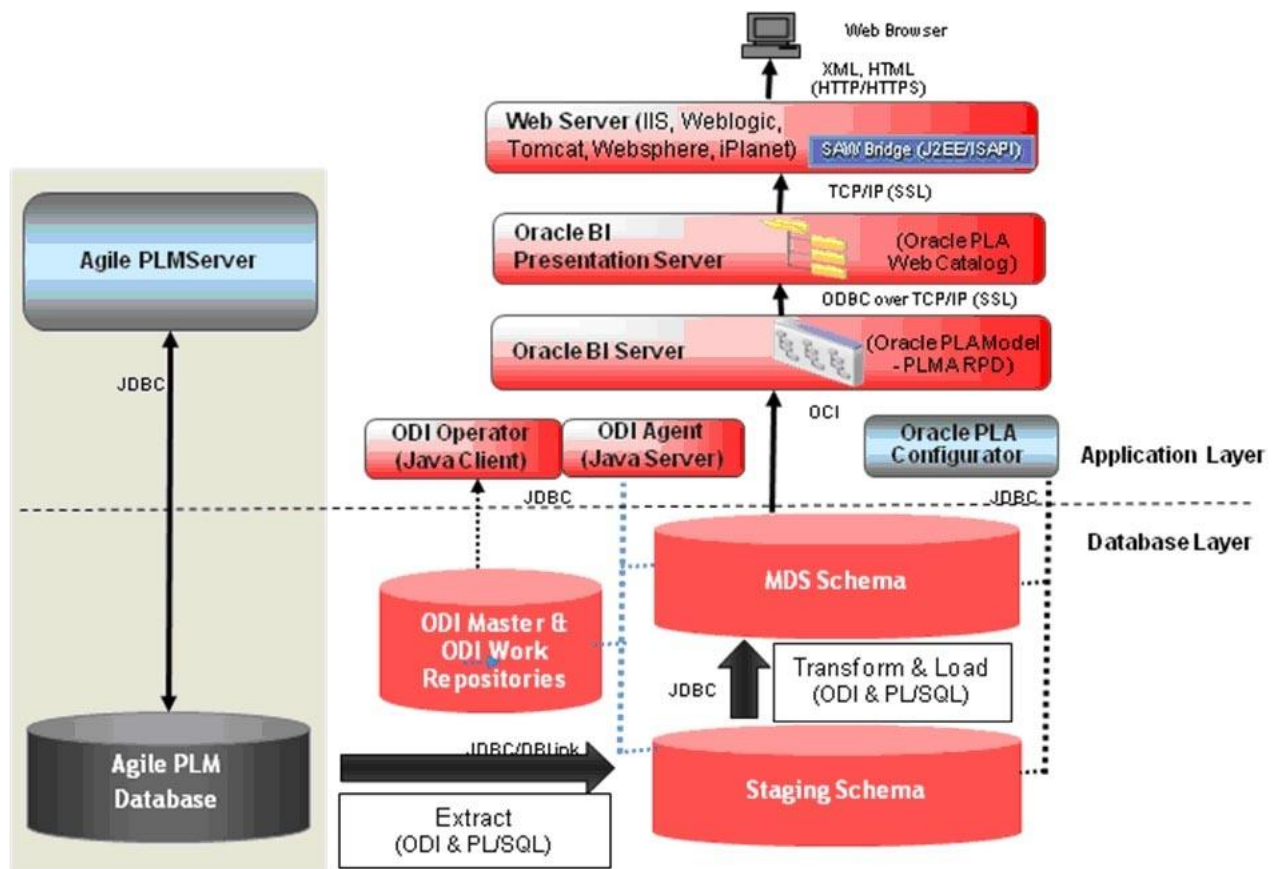
Application Layer

The Application layer is distributed across one or more servers and consists of the following components:

- Oracle Data Integrator Components
 - ODI Agent
 - ODI Studio
- Oracle PLA Configurator (for Agile PLM only)
- JDK or JRE
- Oracle Business Intelligence Enterprise Edition components
 - Oracle BI Server
 - Oracle BI Presentation Server
 - Web Server: IIS, OC4J, WebLogic, WebSphere, or Apache Tomcat
- Browser Clients: Internet Explorer or Firefox
- Oracle PLA components installed on OBIEE
 - Oracle PLA RPD on Oracle BI Server
 - Oracle PLA Web Catalog on Oracle BI Presentation Server

The figures below show the basic product architecture for Oracle PLA with Agile PLM and for Oracle PLA with Agile PLM for Process, respectively.

Oracle PLA with Agile PLM



Oracle PLA with Agile PLM for Process

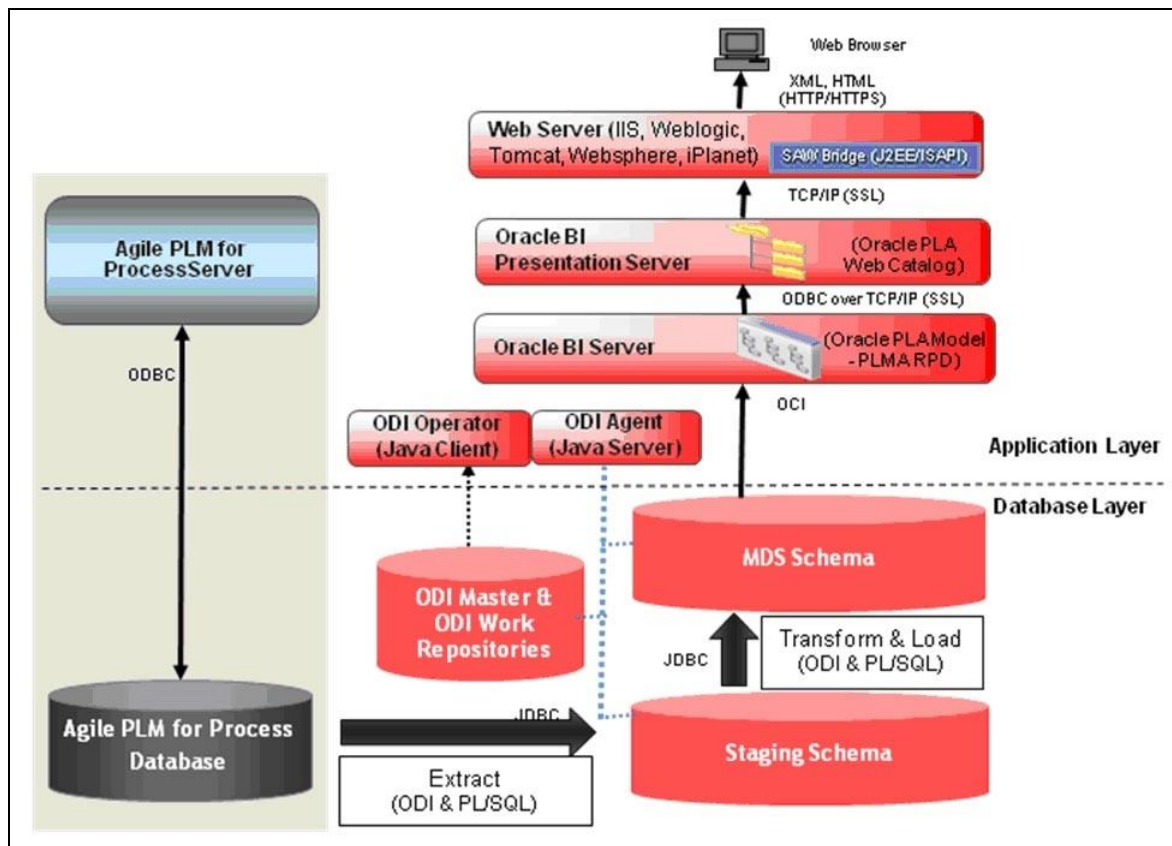


Table 2.1 lists the major components in the Database Layer and their descriptions.

Database Layer Component	Description
Staging Schema	A schema with staging tables that temporarily extracts data from the Agile PLM OLTP database, and transforms and loads data to the target MDS Schema. The temporary entities are not published, and change from one release to another.
ODI Master Repository	A schema that maintains all ODI topology and connectivity information.
ODI Work Repository	A schema that maintains information related to the definition and execution of ETL processes.

Database Layer Component	Description
MDS Schema	A star schema that contains fact and dimension tables enabling you to create analytical reports using any reporting application.

Table 2.2 lists the major components of the Application Layer and their descriptions.

Application Layer	Description
ODI Agent	A Java service allowing execution of scheduled ETL scenarios, or on demand ETL jobs, to extract data from one or more physical sources, transform it, and eventually load the data to a target schema.
ODI Console	A web-based interface used mainly by business users (administrators and operators) to manage scenarios, monitor sessions, and manage the content of the error tables generated by Oracle Data Integrator. ODI Console interface seamlessly integrates with Oracle Fusion Middleware Control Console.
ODI Studio	A design time component consisting of Designer, Operator, Topology, and Security Navigator. This is developer tool. Mainly used by developers and administrators - to develop and manage ODI. ODI Studio is NOT required at run time.
Oracle PLA Configurator [in Agile PLM]	A Java client that enables you to associate configurable PLM data to the MDS this association depends on various individual user PLM configurations. This application gets installed with the Oracle PLA installation.
Oracle PLA Model (PLMA RPD)	A metadata repository containing MDS tables metadata, business rules (such as measures, formulae, hierarchical dimensions), and user-specific roles and privileges required to create analytics reports. This application gets installed and configured with the Oracle BI Server.

Application Layer	Description
Oracle PLA Web Catalog	Presents organized information in report form on Oracle PLA Interactive Dashboards. This application gets installed and configured with the Oracle BI Presentation Server.

General Security Principles

This chapter includes the following:

▪ Keep Software Up-To-Date	9
▪ Restrict Network Access to Critical Services	9
▪ Follow the Principle of Least Privilege	10
▪ Monitor System Activity	10
▪ Keep Up-To-Date on Latest Security Information	11

The following principles are fundamental to using any application securely.

Keep Software Up-To-Date

One principle for good security practice is to keep all software versions and patches up-to-date. To ensure that you have the most current and updated Oracle PLA software for the latest version, regularly check the Oracle Critical Patch updates page.

<p>Important Unless otherwise noted, this guide assumes you have installed Oracle Product Lifecycle Analytics (Oracle PLA) Release 3.3.1.1.0 or later.</p>

Restrict Network Access to Critical Services

Keep both the Oracle Product Lifecycle Analytics (Oracle PLA) application and the database behind a firewall. In addition, place a firewall between the middle-tier and the database. The firewall provides assurance that access to these systems is restricted to a known network route, which can be monitored and restricted, if necessary. As an alternative, a firewall router substitutes for multiple, independent firewalls.

If you cannot use firewalls, then configure the TNS Listener Valid Node Checking feature (it restricts access based upon IP address). Restricting database access by IP address often causes application client/server programs to fail for DHCP clients.

To solve this problem, use any of the following:

- static IP addresses
- software VPN
- hardware VPN
- software VPN and hardware VPN
- Windows Terminal Services or its equivalent.

Follow the Principle of Least Privilege

The principle of least privilege states that users should be given the least amount of privilege to perform their jobs.

Over-ambitious granting of responsibilities, roles, grants, and so on, especially early in an organization's life cycle when people are few and work needs to be done quickly, often leaves a system wide open for abuse.

User privileges should be reviewed periodically to determine relevance to current job responsibilities.

Monitor System Activity

System security stands on three legs:

- good security protocols
- proper system configuration
- system monitoring

Auditing and reviewing audit records address this third requirement. Each component within a system has some degree of monitoring capability. Follow audit advice in this document and regularly monitor audit records.

Keep Up-To-Date on Latest Security Information

Note Oracle continually improves its software and documentation. Check this note yearly for revisions.

The Oracle PLA application's foundation is Oracle Business Intelligence Enterprise Edition (OBIEE). OBIEE is a comprehensive suite of enterprise business intelligence products containing the programs, servers, and tools to support broad self-service access across the organization.

Oracle PLA uses ODI (a comprehensive data integration platform) to build its out-of-the-box Multi-Dimensional Schema (MDS).

Note For more information, go to the Oracle Technology Network website (<http://www.oracle.com/technetwork/middleware/data-integrator/downloads/index.html> <http://www.oracle.com/technetwork/middleware/data-integrator/downloads/index.html>).

Secure Installation and Configuration

This chapter includes the following:

▪ Installation Overview.....	13
▪ Installation – Prerequisites.....	14
▪ Installing Oracle Product Lifecycle Analytics	15
▪ Installing Product Components.....	16
▪ Post-Installation Configuration.....	16

This chapter describes recommended deployment topologies and also provides recommendations for installing and configuring a secure setup for your Oracle Product Lifecycle Analytics (Oracle PLA) application.

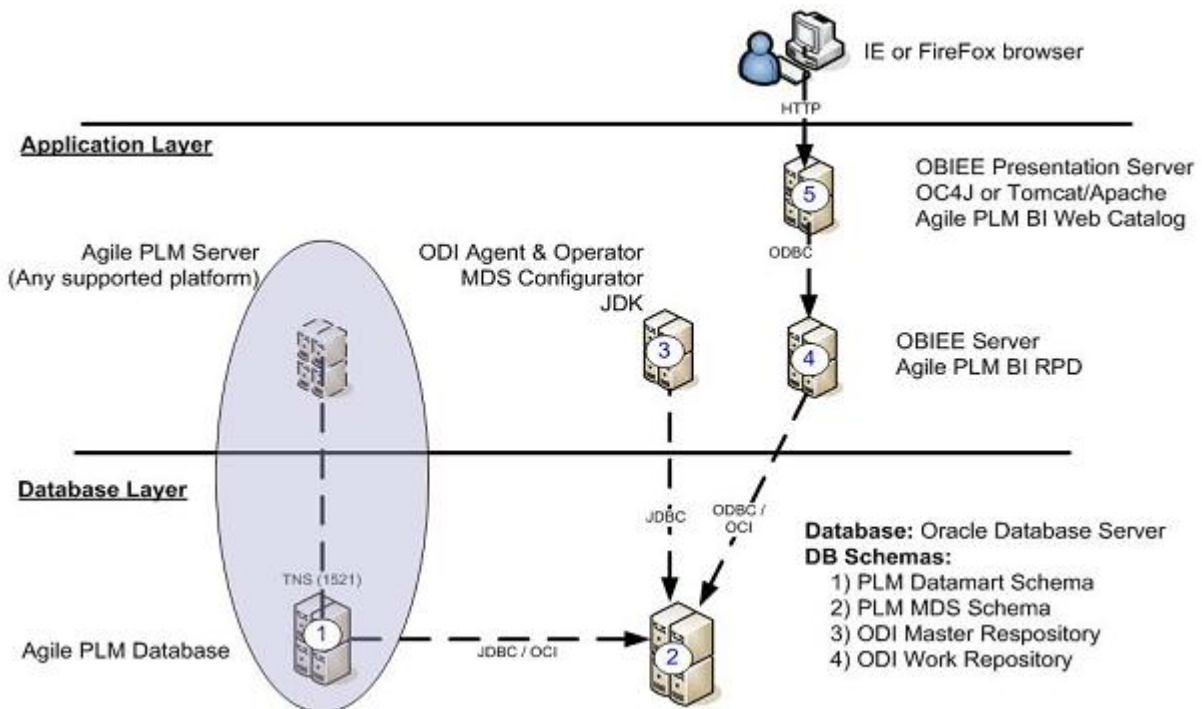
Installation Overview

Various database and application components for Oracle Product Lifecycle Analytics (Oracle PLA) can be deployed in different hardware and machine configurations.

The complexity of your deployment configuration depends on the performance criteria set, which in turn, is based on the following:

- Business requirements
- Source - that is the Agile PLM database size or the Agile PLM for Process database size
- Volume of data changes in the source database
- IT network constraints
- Infrastructure constraints

Oracle PLA Agile PLM Deployment Configuration for a Large Customer Base



To successfully install or upgrade to Oracle PLA 3.3.1.1.0, you must be familiar with, or have working knowledge of the following:

- ODI
- OBIEE
- Agile PLM
- Agile PLM for Process
- the Oracle Database Server

For more information on the privileges needed for different deployment methods, see the Appendix on [Oracle PLA Database Schema Privileges](#) on page 41.

Installation – Prerequisites

The Oracle Product Lifecycle Analytics (Oracle PLA) application comes bundled with a number of third party software. Oracle PLA is tested and certified with latest security patches for the following third party software:

- [Bouncy Castle](http://www.bouncycastle.org) <http://www.bouncycastle.org>
- [Apache Xerces Project](http://xerces.apache.org) <http://xerces.apache.org>
- [InstallAnywhere](http://www.flexerasoftware.com/products/installanywhere.htm) <http://www.flexerasoftware.com/products/installanywhere.htm>
- [Apache Ant](http://ant.apache.org) <http://ant.apache.org>
- [LOG4J](http://log4j.apache.org) <http://log4j.apache.org>

Before installing Oracle PLA you must install and configure the following Oracle products:

- Oracle Enterprise Database, see *Oracle® Database 11g Release 2 Documentation Library*.
- Oracle Data Integrator, see *Oracle® Fusion Middleware Installation Guide for Oracle Data Integrator 11g Release 1 (11.1.1)*.
- Oracle Business Intelligence Enterprise Edition, see *Oracle Business Intelligence Suite Enterprise Edition Documentation Library*.
- Oracle Data Integrator 11.1.1.6.

Important You should also consult the following Security Guides:

Oracle Business Intelligence Suite Enterprise Edition Documentation Library

Oracle Database Security Guides

Installing Oracle Product Lifecycle Analytics

The following steps outline how to install Oracle PLA.

To install Oracle Product Lifecycle Analytics:

1. Verify hardware and software requirements. For more information, see the "System Requirements" chapter in the *Oracle PLA Installation and Setup Guide*.
2. Download Oracle PLA. For more information, see the "Obtaining Software" section in the *Oracle PLA Installation and Setup Guide*.

3. If you are upgrading to the latest version of Oracle PLA, see the "Upgrade Considerations" chapter in the *Oracle PLA Installation and Setup Guide*.
4. Install the Oracle PLA application: This includes how to use the Oracle PLA Installer, installing the Staging Schema and ETL Components, and installing the BI Components. For more information, see the "Oracle PLA Installation" chapter in the *Oracle PLA Installation and Setup Guide*.
5. Post Installation Tasks: This includes how to add Database Services to the Listener (if applicable), verify ODI Repositories, start Services, configure the Connection Pool Settings in OBIEE, administer user names and passwords in OBIEE Administrator, and enable PLM Reference Attributes in the Configurator. For more information, see the "Post-Installation Tasks" section in the *Oracle PLA Installation and Setup Guide*.
6. Executing the ETL: This includes how to optimize the ETL performance (by configuring the DB session and process parameters, modifying the Heap Size in ODI, and set the `ODITimeOutParameter` in ODI), create user names and passwords for ODI users, and run the ETL. For more information, see the "Executing ETL" section in the *Oracle PLA Installation and Setup Guide*.

Installing Product Components

Installing Oracle PLA product components occurs when you install the Oracle PLA application (see Step 4 in "[Installing Oracle PLA](#) on page 15").

The following components are installed:

- Data Mart Schema and ETL components
- BI components

For more information, see the "Oracle PLA Installation" chapter in the *Oracle PLA Installation and Setup Guide*.

Post-Installation Configuration

General post-installation tasks are as follows:

1. How to add Database Services to the Listener (if applicable, and using Oracle Net Manager).

2. Verify ODI Repositories using ODI Studio.
3. Start services or processes (in this order - OC4J or IIS, Oracle BI Java Host, Oracle BI Server, Oracle BI Presentation Server).
4. Configure the Connection Pool Settings in OBIEE using OBIEE Administrator.
5. Create user names and passwords in OBIEE Administrator (for more information on administering users and passwords, see the *Oracle® Fusion Middleware System Administrator's Guide for Oracle Business Intelligence Enterprise Edition 11g Release 1 (11.1.1)* http://docs.oracle.com/cd/E14571_01/bi.1111/e10541/toc.htm).
6. Enable PLM Reference Attributes in the Oracle PLA Configurator (if applicable).
7. Secure all Oracle PLA log files, log files, configurator files, product line security files (rpd), see the section titled "Access Control at the Folder and File Level".

For more information, see the "Post-Installation Tasks" section in the *Oracle PLA Installation and Setup Guide*.

Another important post-installation concern is creating user names and passwords in ODI. This step occurs right before you start the ETL (see Step 6 in the section titled "[Installing Oracle Product Lifecycle Analytics](#) on page 15"). For more information, see the "Post-Installation Tasks" section in the *Oracle PLA Installation and Setup Guide* and the *Oracle® Data Integrator Release 11.1.1.6 Installation Guide*.

Security Features

This chapter includes the following:

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▪ Security Model	22
▪ Configuring and Using Authentication in Oracle PLA	23
▪ Configuring and Using Access Control	28
▪ Configuring and Using Security Audit	34

Oracle Product Lifecycle Analytics (Oracle PLA) includes security features to provide data protection.

These features include:

- **Authentication** - allows only permitted individuals to get access to the system and data.
- **Access Control (Authorization)** - provides authorized individuals access control to system privileges and data.
- **Audit** - allows Administrators to detect attempted breaches of authorization and attempted (or successful) breaches of access control.

Table 6.1 provides a high level overview of the various Oracle PLA security features.

Security Features/ Technology Stack		Authentication	Access Control (Authorization)	Audit
Web Browser (Desktop tier)		Default Security Feature	Default Security Feature	Default Security Feature
Application Layer	OBIEE	Default OBIEE authentication	<p>No out of box access control provided.</p> <p>Object level security Model:</p> <p>Refer to Security model: Object level security.</p> <p>Data level security is provided – Refer to Security model: Data Level security.</p>	<p>Default OBIEE audit feature.</p> <p>Refer to section Configuring and Using Security Audit</p>
	ODI	Default ODI authentication	Default ODI Access control	Default ODI feature
	Configurator	Default DB authentication based on DataMartConfig.properties of Configurator.	Default access control provided at DB level.	<p>Audit details are captured at Oracle PLA Install Home/logs/Configurator.log</p> <p>Detailed logging is enabled in ETL level for ODI and PLSQL Code.</p>

Security Features/ Technology Stack	Authentication	Access Control (Authorization)	Audit
Data Layer	<p>Default Oracle DB authentication</p> <p>Default file based authentication for external csv files.</p>	<p>Access to source is based on DB Link.</p> <p>And to Staging objects is based on Synonyms.</p> <p>Specific privileges are provided to Staging and Target users. Refer to Appendix B for details.</p> <p>Access to file external csv files are controlled by access privileges to folder at which Oracle PLA is deployed.</p>	<p>Default Oracle DB audit feature.</p> <p>Default OS audit feature at file level for external csv files.</p>

Password Policy

A password policy is a set of rules dictating how to use passwords. Some of the rules a password policy sets are:

- The maximum length of time a password is valid
- The minimum number of characters in a password
- The mandatory number of numeric characters in a password

Password policies play an important role when attempting to access a directory. The directory server ensures that the password entered adheres to the password policy.

Oracle Product Lifecycle Analytics (Oracle PLA) is dependent on Oracle Business Intelligence Enterprise Edition (OBIEE) password policy.

If you are using the OBIEE 11.x.x.x version, you automatically adhere to the Oracle password policy. Use the Oracle Internet Directory to set passwords. For more information, see the *Oracle® Fusion Middleware Administrator's Guide for Oracle Internet Directory 11g Release 1*.

Note You must secure Oracle Fusion Middleware components using SSL version 3 or TLS version 1. For more information, see *Oracle® Fusion Middleware System Administrator's Guide for Oracle Business Intelligence Enterprise Edition 11g*.

Security Model

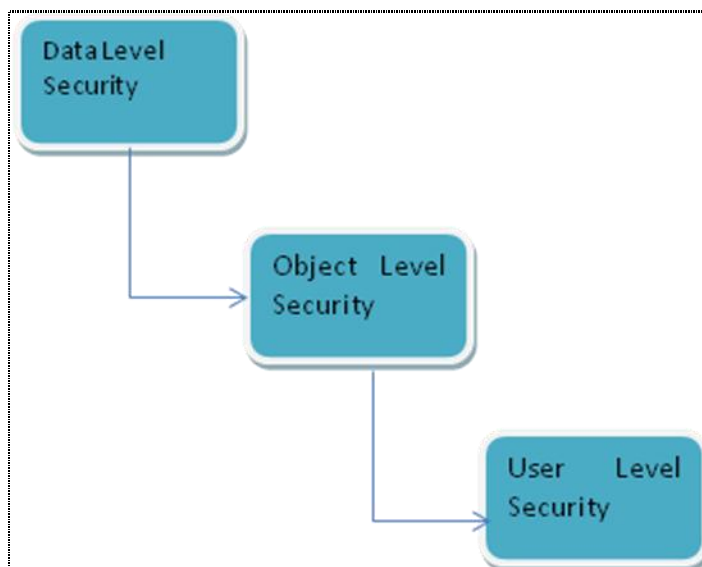
In today's environment it is critical to have a properly secured computing infrastructure.

A secured infrastructure strikes a balance between:

- Exposure risk
- Security costs
- Value of the information to protect (monetary or other)

Oracle Product Lifecycle Analytics (Oracle PLA) achieves this balance and protects information by using a three-level hierarchy model. See the Oracle PLA Security Hierarchy figure for a better understanding.

Oracle PLA Security Hierarchy



Data-Level Security

Data-level security is a restricted security status. Restriction, or access, is based on access control permissions given by an Administrator.

The security level determines (through the Administrator) who gets to see particular data, *and* if they can access it.

For example, you can restrict a user's access to project analysis to only their product lines.

Object Level Security

Object-level security controls and restricts the visibility to business logic objects by user role.

For example, object-level security for dashboards can be set up based on subject areas and roles.

User-Level Security (User Authentication)

User-level security is the authentication and confirmation of a user's identity based on the credentials provided.

This is your basic login and password at the lowest level. At higher levels, it can consist of a number of authentications and confirmations (at various degrees of encryption).

Configuring and Using Authentication in Oracle PLA

Oracle Product Lifecycle Analytics (Oracle PLA) supports both of the following high-level authentication configurations:

1. Oracle PLA authentication at ETL layer
2. Oracle PLA authentication at OBIEE layer

Authentication at ETL Layer

You can change or modify your password *after* installing Oracle Product Lifecycle Analytics (Oracle PLA).

At the ETL layer different methods are used for changing different passwords.

You change the password for the Staging Schema connection details in the Physical Repository of ODI Topology Manager. For more information, see the *Oracle Data Integrator Installation and Configuration Guide*.

You can change the Oracle PLA Configurator password using Oracle PLA encryption methods.

You can change the password for the ODI repositories using the ODI Agent.

Authentication at the ETL Layer using Oracle PLA Encryption Methods

You can change the passwords for the Oracle PLA Configurator using Oracle PLA encryption methods.

To change passwords:

1. From the command prompt navigate to `<Oracle_PLA_Home>\bin\`.
2. For Windows: Type, `DMEncoder.bat <new password>`
For Linux: Type, `DMEncoder.sh <new password>`
3. The system generates an encoded password. Copy the encoded password, and exit the command prompt.
4. Navigate to `<Oracle_PLA_Home>\bin\DataMartConfig.properties` and open the `DataMartConfig.properties` file.
5. In the `DataMartConfig.properties` file navigate to the parameter whose password you want changed, and manually replace the old password with the new encoded password. Refer to the table below to locate the parameter you need to change.
6. Save and close the `DataMartConfig.properties` file

To Change the Password for:	Parameter to Navigate to in the <code>DataMartConfig.properties</code> file
Agile PLM Source schema password	PLM_DB_PWD
Agile PLM for Process Source schema password	PLM4P_DB_USER_PWD
Data Mart Database sys schema password	SYS_USER_PASSWORD

To Change the Password for:	Parameter to Navigate to in the <code>DataMartConfig.properties</code> file
Data Mart Database system schema password	DB_SYSTEM_PWD
Data Mart schema password	MDS_USER_PASSWORD
Source schema Password, if installed as a separate schema	ODM_USER_PASSWORD
Master Repository schema password	MASTER_PWD
Work Repository schema password	WORK_PWD
Work Repository password	WORK_REP_PWD

Authentication at the ETL Layer using the ODI Agent

You can also change passwords at the ETL layer employing the ODI Agent or the ODI Studio for the following:

- Master Repository Database password
- Work Repository Database password
- ODI Work Repository password

To change passwords in ODI 10g:

1. From the command prompt navigate to `<ODI Install>\bin\`.
2. For Windows: Type, `encode.bat <new password>`
For Linux: Type, `encode.sh <new password>`

To change passwords in ODI 11g:

1. From the command prompt navigate to `<ODI_HOME>\Oracle_ODI_1\oracledi\agent\bin.`
2. For Windows: Type, `encode.bat <new password>`

For Linux: Type, `encode.sh <new password>`

Authentication at the Oracle Business Intelligence Enterprise Edition Layer

The Oracle Product Lifecycle Analytics (Oracle PLA) application utilizes the Oracle Business Intelligence Enterprise Edition Layer (OBIEE) layer's platform authentication features.

You change the password for the `PLMAXX_11G.rpd` repository file (where XX represents either Agile PLM or Agile PLM for Process) using the OBIEE Admin Tool. For more information, see the *OBIEE Installation and Configuration Guide*.

Oracle PLA uses OBIEE authentication features. We recommend you use the authentication features in the order shown below:

- LDAP authentication - We recommend that you configure the Oracle PLA application to use LDAP authentication, only if your Agile PLM application is configured to LDAP authentication.
- External table authentication - We recommend that you configure the Oracle PLA application to use external table authentication, only if your Agile PLM application is configured to external table authentication.
- Database authentication - We recommend that you configure the Oracle PLA application to use database authentication, only if your Agile PLM application is configured to database authentication.
- Oracle BI Server user authentication maintenance - We do not recommend using the Oracle BI Server authentication mechanism.

LDAP Authentication

LDAP authentication is used as an alternative to storing user IDs and passwords in an Oracle BI repository.

You can set up the Oracle BI Server to take the user ID and password, and have it then pass the user ID and password to an LDAP server for authentication.

For LDAP authentication the server uses clear text passwords.

You can configure OBIEE to secure communications between different points in the network. OBIEE 11g supports SSL version 3, and TLS version 1.

Important You must configure your LDAP servers to allow this.
--

External Table Authentication

You can maintain lists of users and their passwords in an external database table, instead of storing user IDs and passwords in an Oracle BI repository. You can then use this table for authentication purposes. The external database table contains the following information:

- User IDs
- Passwords
- Group membership
- Display names (used for Oracle BI Presentation Services users)
- Specific database catalog names
- Schemas to use for individual users(when querying data)

You can also configure user level security with the user authentication information (stored in the external source system). For example, in Agile PLM the **AgileUser** table (stores encrypted user IDs and passwords).

Database Authentication

The Oracle BI Server authenticates users through database logons.

If a user has Read permission on a specified database, the Oracle BI Server trusts that user. This authentication method can also be applied for Oracle BI Presentation Services users.

Maintaining Oracle BI Server User Authentication

Using the Administration Tool, you can maintain lists of users and their passwords in the Oracle BI repository. The Oracle BI Server authenticates users against this list when a user logs on (unless another authentication method has already been used, or a database authentication is specified in the `NQSConfig.INI` file).

The Oracle BI Server user IDs are case insensitive and stored in a non-encrypted form in the Oracle BI repository. Whereas, Oracle BI Server passwords are case sensitive and stored in an encrypted form.

If the user has the required access privileges, the Oracle BI Server user IDs can access any business model in a repository.

Important User IDs are valid only for the repository in which they are set up. They do not span multiple repositories.

For more information on password policy settings in OBIEE, see the [Oracle® Fusion Middleware System Administrator's Guide for Oracle Business Intelligence Enterprise Edition 11g Release 1 \(11.1.1\)](http://download.oracle.com/docs/cd/e14571_01/bi.1111/e10541/toc.htm) http://download.oracle.com/docs/cd/e14571_01/bi.1111/e10541/toc.htm.

Configuring and Using Access Control

Authorization primarily includes two processes:

1. Permitting only certain users to access, process, or alter data
2. Applying varying limitations on user access or actions.

Oracle Product Lifecycle Analytics (Oracle PLA) supports access control at the folder and file level, as well as at the following configurations:

1. Access control at the data-level
2. Access control at the object-level security
3. Access control at the user-level security

Access Control at the Folder and File Level

Oracle Product Lifecycle Analytics (Oracle PLA) uses host Operating System file permission features to control authentication of directories, executables, server software, data files, logs, external csv files.

When Oracle PLA is deployed appropriate access privileges are provided to the directories and folders. Files often contain sensitive and critical information, and must be protected from prying eyes, modification, or deletion.

Caution You must secure all Oracle PLA log files, external files, configurator files, product line security files (rpd) listed below. Not doing so can result in files being corrupted, destroyed, or rewritten.

1. Only Administrators should have Read, Write and Execute privileges for the DataMartConfig.properties file, located at
<Oracle_PLA_Home>\bin\DataMartConfig.properties.

For *both* Oracle PLA with Agile PLM and Oracle PLA with Agile PLM for Process.

2. Make sure that the external (csv) files listed in the table below are secured. The files location is
<Oracle_PLA_Home>\install\et\srcfiles.

	Administrator	User
Post-Installation File	Value	Value
PPM_PRD_DEMAND.CSV	Read & Write	Read
PPM_PRD_INV_QTY.CSV	Read & Write	Read
PPM_PRD_INV_VALUE.CSV	Read & Write	Read
PPM_PRD_INV_VALUE.CSV	Read & Write	Read
PPM_PRD_UNIT_REC.CSV	Read & Write	Read
PPM_PRD_UNIT_SHIP.CSV	Read & Write	Read
PRJ_COST.CSV	Read & Write	Read
PRJ_FORECAST.CSV	Read & Write	Read

3. Make sure that the log files listed in the table below are secured.

Note Log files are located at <Oracle_PLA_Home>\logs.

	Administrator	User
Post-Installation File	Value	Value
BI_DATA_DICT_PC_SD.log	Read, Write, Execute	Read
BI_DATA_DICT_PPM_SD.log	Read, Write, Execute	Read

	Administrator	User
Post-Installation File	Value	Value
BRIDGE_SD.log	Read, Write, Execute	Read
ControlTables.log	Read, Write, Execute	Read
install_logger4odm.log	Read, Write, Execute	Read
LIST_DM_SD.log	Read, Write, Execute	Read
MDS_COMMENT.log	Read, Write, Execute	Read
MDS_DDL.log	Read, Write, Execute	Read
MDS_IND.log	Read, Write, Execute	Read
MDS_PROCS.log	Read, Write, Execute	Read
MDS_SD.log	Read, Write, Execute	Read
MDS_TEMP_DDL.log	Read, Write, Execute	Read
MDS_VIEWS.log	Read, Write, Execute	Read
ODM_DDL.log	Read, Write, Execute	Read
ODM_PROC.log	Read, Write, Execute	Read
PC_DDL.log	Read, Write, Execute	Read
PPM_DDL.log	Read, Write, Execute	Read
SEED_DATA_GLOBAL.log	Read, Write, Execute	Read
SingleSchemaCreation.log	Read, Write, Execute	Read
USERDEF_OBJ.log	Read, Write, Execute	Read

4. Make sure that the following rpd file is secure.

Note Location for RPD file: <Oracle_PLA_Home>\olap\rpd

Note RPD File name: PLMA_11G.rpd

Access Control at the Data-Level

Data-level security controls the visibility of data (content in subject areas, dashboards, Oracle BI Answers, and so on) based on the user's association to data in the transactional system.

For example, restricting authorized users access to Project Analysis for their assigned Product Lines is provided in Oracle Product Lifecycle Analytics (Oracle PLA) 3.3.

To extend data-level security for repository objects:

1. Extend the physical table by adding the attribute by which the dimension, or fact, needs to be secured.

Important This step *may* result in a change to the data model.

- a. For enabling existing out-of-the-box defined dimensions and measures *without* changing ETL Mapping you can map attributes in the Oracle PLA Configurator.
- b. For enabling new user-defined dimensions and measures by changing ETL mapping and BI repository, new user defined attributes can be added using Schema Enhancer that comes with Oracle PLA Configurator

Important This step results in a change to the data model.

Populate the relevant attribute value for each row in the fact or dimension table.

Important This step results in a change to the ETL mapping.

2. Use the Oracle BI Administration Tool to create an initialization block. When a user logs into Oracle PLA, the initialization block fetches the attribute values and populates them into a session variable. You can then create a target session variable for the initialization block. For detailed instructions, see Oracle Fusion Middleware Metadata Repository Builder's Guide for Oracle Business Intelligence Enterprise Edition.

Important You can only create a target session variable if the initialization block is *not* a row-wise initialization block.

This step results in a change to the Oracle BI repository.

3. Use the Oracle BI Administration Tool (in online mode) to set up data filters based on the new role for each of the fact and dimension tables that need to be secured by the attribute you added in Step 1.

Important This step results in a change to the Oracle BI Repository.

4. Use Presentation Services administration to set up the Presentation Services catalog privileges - based on the application role you created in step 4. For detailed instructions, see Oracle Fusion Middleware Security Guide for Oracle Business Intelligence Enterprise Edition 11g.

Note You can also leverage the existing Oracle PLA security objects (when extending data-level security). To do this, copy existing security objects for secured dimensions, such as initialization blocks, and then modify them to apply to the additional dimensions.

Access Control at the Object-Level

You can enable object-level security using the Oracle Business Intelligence Enterprise Edition Layer (OBIEE) platform features.

Oracle Product Lifecycle Analytics (Oracle PLA) tightly integrates with OBIEE, as well as the security model of the operational source system, to allow the right content to be shown to the right user.

Important You should be thoroughly familiar with the security features of OBIEE before you begin working with Oracle PLA.

Security settings for OBIEE are made in the following Oracle Business Intelligence (Oracle BI) components:

1. **Oracle BI Administration Tool**

You can use the Oracle BI Administration Tool to perform tasks such as:

- Setting permissions for business models, tables, columns, and subject areas
- Specifying filters to limit data accessibility
- Setting authentication options

For more detailed information, see *Oracle Fusion Middleware Metadata Repository Builder's Guide*

for *Oracle Business Intelligence Enterprise Edition 11g*.

2. Oracle BI Presentation Services Administration

You can use Oracle BI Presentation Services Administration to perform tasks such as setting permissions to Presentation Catalog objects (including dashboards and dashboard pages).

For more detailed information, see *Oracle Fusion Middleware Security Guide for Oracle Business Intelligence Enterprise Edition 11g*.

3. Oracle Enterprise Manager Fusion Middleware Control

You can use Fusion Middleware Control to manage the policy store, application roles, and permissions for determining functional access.

For detailed information, see *Oracle Fusion Middleware Security Guide for Oracle Business Intelligence Enterprise Edition 11g*.

4. Oracle WebLogic Server Administration Console

You can use the Administration Console to manage users and groups in the embedded Oracle WebLogic Server LDAP. You can also use the Administration Console to manage security realms, and to configure alternative authentication providers.

For detailed information, see *Oracle Fusion Middleware Security Guide for Oracle Business Intelligence Enterprise Edition 11g*.

Access Control at the User-Level

User-level security involves the authentication and confirmation of the user's identity - based on the credentials provided, such as username and password.

By default, user-level security is set up in the embedded Oracle WebLogic Server, the LDAP server, and the policy store.

See also *Oracle Fusion Middleware Security Guide for Oracle Business Intelligence Enterprise Edition 11g*.

Configuring and Using Security Audit

This section explains how to enable the security audit feature in Oracle Product Lifecycle Analytics (Oracle PLA).

Oracle Business Intelligence Enterprise Edition (OBIEE) supports extensive audit features including, but not limited to, error events, informational events, and warning events. Some examples are, server starting and server shutdown, failed login attempts, and failed access control authorizations.

In OBIEE 11g, security auditing is integrated into the Oracle Fusion Middleware Audit Framework in Oracle Fusion Middleware Application Security, and it provides a range of out-of-the-box reports that are accessible through Oracle Business Intelligence Publisher.

The reports are grouped according to the type of audit data they contain:

- Common Audit Reports
 - Account Management
 - User Activities
 - Errors and Exceptions
- Component-Specific Audit Reports
 - Oracle Fusion Middleware Audit Framework
 - Oracle HTTP Server
 - Oracle Internet Directory
 - Oracle Virtual Directory
 - Reports Server
 - Oracle Directory Integration Platform
 - Oracle Identity Federation
 - Oracle Platform Security Services
 - Oracle Web Services Manager
 - Oracle Web Cache

For more information, see the Oracle® Fusion Middleware Application Security Guide http://docs.oracle.com/cd/E21764_01/core.1111/e10043/toc.htm

Configuring and Using Oracle PLA Configurator

Oracle Product Lifecycle Analytics (Oracle PLA) comes with the Oracle PLA Configurator tool. The Oracle PLA Configurator provides the ability to map source columns to target columns (based on customer choice) in the data layer.

It is a standalone feature and uses independent encryption algorithms to connect with source and target Data Schema for Agile PLM 9 Schema

The following security features are implemented with Oracle PLA release 3.3.1.1.0.

- Uses Blowfish based encryption for DB level authentication stored in `DataMartConfig.properties` file.
- Uses 3rd party software components XML Parser. This component is upgraded to latest patch. (From Xerces 2.9.0 to Xerces2 2.11.0).

Note Oracle PLA also provides ability to map extended attributes with MDS Layer for Agile PLM for Process source. Manual SQL scripts are supplied for updating MDS Schema.

- Uses default DB level authentication.

Security Considerations for Developers

Oracle Product Lifecycle Analytics (Oracle PLA) supports the extension of the standard product functionality *only* in the following two scenarios:

1. You can enable existing defined dimensions and measures without changing ETL Mapping. This requires changes *only* to the BI repository.
2. You can enable new user-defined dimensions and measures. This requires changes to *both* the ETL Mapping and the BI repository.

In both scenarios you must ensure that the preconfigured Oracle PLA security model is updated to match your operational source system.

When you extend Oracle PLA, you must ensure that your customizations and any new objects are valid and functional.

Oracle PLA Secure Deployment Checklist

The following security checklist includes guidelines that help secure your database:

1. Install only what is required.
2. Lock and expire default user accounts.
3. Enforce password management.
4. Enable data dictionary protection.
5. Practice the principle of least privilege.
 - a. Grant necessary privileges only.
 - b. Revoke unnecessary privileges from the PUBLIC user group.
 - c. Restrict permissions on run-time facilities.
6. Enforce access controls effectively and authenticate clients stringently.
7. Restrict network access.
 - a. Use a firewall.
 - b. Never poke a hole through a firewall.
 - c. Protect the Oracle listener.
 - d. Monitor listener activity.
 - e. Monitor who accesses your systems.
 - f. Check network IP addresses.
 - g. Encrypt network traffic.
 - h. Harden the operating system.
8. Apply all security patches and workarounds.
9. Contact Oracle Security Products if you come across any vulnerability in the Oracle Database.

Database Schema Privileges

This Appendix includes the following:

- Single Database Schema Privileges..... 41
- Oracle PLA Multiple Schema Privileges 42

In Oracle Product Lifecycle Analytics (Oracle PLA), database privileges vary for single schema and multiple schema installations.

Single Database Schema Privileges

This table lists and explains the privileges required to use a single schema to host the DataMart, ODI Master, and the ODI Work Repository objects in Oracle Product Lifecycle Analytics (Oracle PLA).

Privilege	Purpose
CONNECT,RESOURCE	Basic privilege for the Schema User
CREATE DATABASE LINK	Create DBLink to Agile PLM source system for every ETL run
CREATE TABLE	Create table privilege for the schema
CREATE SYNONYM*	Create a synonym for the source table
CREATE MATERIALIZED VIEW*	Create materialized view on the schema
DROP PUBLIC DATABASE LINK	Drop database link on schema
ANALYZE ANY*	Analyze the table for performance
SELECT ON V_\$DATABASE	Read Platform information
ALL ON SYS.DBMS_PIPE	PL/SQL logger privileges
EXECUTE ON, SYS.DBMS_SYSTEM	

Privilege	Purpose
CREATEVIEW	Create a View on the Schema
CREATEPUBLICSYNONYM	Create a synonym on the Schema
DROPPUBLICSYNONYM	Drop a synonym on the Schema
* Agile PLM databases only	

Oracle PLA Multiple Schema Privileges

This table lists and explains the privileges required when you install the ODM and MDS on one schema, and the ODI Master and ODI Work repositories on a separate schema.

Privilege	Purpose
CONNECT, RESOURCE	Required for MDS and ODI Repository schemas
CREATE DATABASE LINK	Create DBLink to Agile PLM source database for every ETL run.
CREATE ANY TABLE	Create i\$,
CREATE ANY SYNONYM	Create a synonym for the source table in the ODI Work Repository schema.
CREATE VIEW	Create a view privilege for the schema.
INSERT ANY TABLE	Insert a table, like i\$, e\$, c\$, in the ODI Work Repository schema.
DELETE ANY TABLE	Delete records from i\$ tables in the ODI Work Repository schema. This is used during an Incremental ETL run.

Privilege	Purpose
SELECT ANY TABLE	Select a table like i\$_listname in the ODI Work Repository schema.
DROP ANY SYNONYM	Drop a synonym in the ODI Work Repository schema.
DROP ANY TABLE	Drop i\$ tables in the ODI Work Repository schema. This is used during Full/Incremental ETL runs.
DROP PUBLIC DATABASE LINK	Drop database link on schema.
SELECT ON V_\$DATABASE	Reads Platform information.
CREATE PUBLIC SYNONYM	PL/SQL Logger privileges.
DROP PUBLIC SYNONYM	
ALL ON SYS.DBMS_PIPE	
EXECUTE ON SYS.DMBS_SYSTEM	

This table lists and explains the privileges required when you install ODM and MDS in different schemas.

Privilege	Purpose
CONNECT, RESOURCE	Basic privilege for schema user
CREATE ANY TABLE	Create i\$, e\$, c\$ tables in the ODI Work Repository schema.
CREATE ANY SYNONYM	Create a synonym for the ODM table in the ODI Work Repository schema.

Privilege	Purpose
CREATE ANY VIEW	Create a view in the schema and JV\$ view on the ODI Work Repository schema.
CREATE ANY INDEX	Create an index in the ODI Work Repository schema for the i\$ tables.
CREATE ANY TRIGGER	Create a trigger on the ODM schema.
CREATE MATERIALIZED VIEW	Create a materialized view on the schema.
INSERT ANY TABLE	Insert a table, like i\$, e\$, c\$, in the ODI Work Repository schema.
DELETE ANY TABLE	Delete records from the i\$ tables in the ODI Work Repository schema. This is used during an Incremental ETL
SELECT ANY TABLE	Select a table, like i\$_listname, in the ODI Work Repository schema.
DROP ANY SYNONYM	Drop a synonym in the ODI Work Repository schema.
DROP ANY TABLE	Drop i\$ tables in the ODI Work Repository schema. This is used during Full and Incremental ETL runs.
DROP ANY INDEX	Drop an index on the schema.
DROP ANY TRIGGER	Drop a trigger on the schema.
DROP ANY VIEW	Drop a view on the schema.
ANALYZE ANY TABLE	Analyze the table for performance
UPDATE ANY TABLE	Update records in the i\$ tables in the ODI Work Repository schema. This is used during an Incremental ETL run.
ALTER ANY TABLE	Alters the schema tables.

SSL Configuration in Oracle Business Intelligence

Secure Socket Layer (SSL) is a cryptographic protocol that enables secure communication between applications across a network. Enabling SSL communication provides several benefits, including message encryption, data integrity, and authentication. An encrypted message ensures confidentiality in that only authorized users have access to it. Data integrity ensures that a message is received intact without any tampering. Authentication guarantees that the person sending the message is who they claim to be.

The SSL Everywhere feature of Oracle Business Intelligence enables secure communications between the components. You can configure SSL communication between the Oracle Business Intelligence components and between Oracle WebLogic Server for secure HTTP communication across your deployment.

The table below contains common SSL configuration tasks. For more information on these tasks, see the "SSL Configuration in Oracle Business Intelligence" chapter in *Security Guide for Oracle Business Intelligence Enterprise Edition 11g Release 1 (11.1.1)*.

Task Map: Configuring SSL Communication for Oracle Business Intelligence

Task	Description
Understand SSL communication in Oracle Business Intelligence.	Understand how SSL communication between components and the application server works.
Configure SSL communication between the Oracle WebLogic Server Managed servers.	<p>The Web server must be configured to use HTTPS before enabling SSL communication for Oracle Business Intelligence.</p> <p>Note Also see the "SSL Configuration in Oracle Fusion Middleware" chapter in the Oracle Fusion Middleware Administrator's Guide.</p>
Configure SSL communication between components.	Configure SSL communication between Oracle Business Intelligence components.

Additional references:

- For more information about SSL concepts and public key cryptography, see "How SSL Works" in Oracle Fusion Middleware Administrator's Guide.

- For information about how to configure SSL for Oracle WebLogic Server, see "SSL Configuration in Oracle Fusion Middleware" in *Oracle Fusion Middleware Administrator's Guide*.

References

- *Oracle® Database Security Guide 11g Release 2 (11.2) Part Number E16543-11*
- *Oracle® Fusion Middleware Securing a Production Environment for Oracle WebLogic Server 11g Release 1 (10.3.1) Part Number E13705-01*
- *Oracle® Fusion Middleware Security Guide for Oracle Business Intelligence Enterprise Edition*
- *Oracle® Data Integrator Release 10.1.3.6 Installation Guide*
- *Oracle® Data Integrator Release 11.1.1.6.2 Installation Guide*
- *Oracle® Product Life Cycle Analytics Documentation*
- *Oracle® Agile PLM 9 Documentation*
- *Oracle® Product Lifecycle Analytics Documentation*
- *Oracle Data Integrator - Security Features, see the "Managing the Security in Oracle Data Integrator" chapter in Oracle® Fusion Middleware Developer's Guide for Oracle Data Integrator 11g Release 1 (11.1.1).*

