Oracle® Application Server TopLink

Getting Started Guide

10*g* Release 2 (10.1.2)

Part No. B15902-01

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Oracle Application Server TopLink Getting Started Guide, 10*g* Release 2 (10.1.2)

Part No. B15902-01

Primary Author: Jacques-Antoine Dubé

Contributing Authors: Rick Sapir, Arun Kuzhimattathil, Janelle Simmons, Madhubala Mahabaleshwar, Preeti Shukla

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Preface

This document provides installation procedures to install and configure Oracle Application Server TopLink (OracleAS TopLink). It also introduces the concepts of OracleAS TopLink.

This preface contains the following topics:

Intended Audience

Oracle Application Server TopLink Getting Started Guide is intended for new users who need to install and configure OracleAS TopLink.

This document assumes that you are familiar with the concepts of object-oriented programming, the Enterprise JavaBeans (EJB) specification, and with your own particular Java development environment.

The document also assumes that you are familiar with your operating system (such as Microsoft Windows, UNIX, or other). The general operation of any operating system is described in the user documentation for that system, and is not repeated in this manual.

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Organization

This document includes the following chapters:

Chapter 1, "Prerequisites for Installing OracleAS TopLink"
This chapter contains information that you should review before you install OracleAS TopLink.

Chapter 2, "Installing and Configuring OracleAS TopLink"
This chapter contains instructions for installing and configuring OracleAS TopLink.

Chapter 3, "Migrating to 10g Release 2 (10.1.2)"
This chapter contains instructions on how to migrate existing OracleAS TopLink 2.x, 3.x and 4.x projects to OracleAS TopLink 10*g* Release 2 (10.1.2).

Glossary
This glossary provides definitions for words and phrases commonly used in OracleAS TopLink.

Related Documentation

For more information, refer to these Oracle resources:

- *Oracle Application Server TopLink Release Notes*
- *Oracle Application Server Release Notes*
- *Oracle Application Server TopLink API Reference*
- *Oracle Application Server TopLink Application Developer's Guide*
- *Oracle Application Server TopLink Mapping Workbench User's Guide*

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If you already have a user name and password for OTN, then you can go directly to the documentation section of the OTN Web site at

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Conventions

This section describes the conventions used in the text and code examples of this documentation set. It describes:

- Conventions in Text
- Conventions in Code Examples

Conventions in Text

We use various conventions in text to help you more quickly identify special terms. The following table describes those conventions and provides examples of their use.

Convention	Meaning	Example
Italics	Italic typeface indicates book titles or emphasis.	*Oracle9i Database Concepts* Ensure that the recovery catalog and target database do *not* reside on the same disk.
UPPERCASE monospace (fixed-width) font	Uppercase monospace typeface indicates elements supplied by the system. Such elements include parameters, privileges, datatypes, Release Manager (RMAN) keywords, SQL keywords, SQL*Plus or utility commands, packages and methods, as well as system-supplied column names, database objects and structures, user names, and roles.	You can specify this clause only for a `NUMBER` column. You can back up the database by using the `BACKUP` command. Query the `TABLE_NAME` column in the `USER_TABLES` data dictionary view. Use the `DBMS_STATS.GENERATE_STATS` procedure.
lowercase monospace (fixed-width) font	Lowercase monospace typeface indicates executables, filenames, directory names, and sample user-supplied elements. Such elements include computer and database names, net service names, and connect identifiers, as well as user-supplied database objects and structures, column names, packages and classes, user names and roles, program units, and parameter values. **Note:** Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.	Enter `sqlplus` to open SQL*Plus. The password is specified in the `orapwd` file. Back up the datafiles and control files in the `/disk1/oracle/dbs` directory. The `department_id`, `department_name`, and `location_id` columns are in the `hr.departments` table. Set the `QUERY_REWRITE_ENABLED` initialization parameter to `true`. Connect as `oe` user. The `JRepUtil` class implements these methods.
lowercase italic monospace (fixed-width) font	Lowercase italic monospace font represents placeholders or variables.	You can specify the *`parallel_clause`*. Run `U`*`old_release`*`.SQL` where *`old_release`* refers to the release you installed prior to upgrading.

Conventions in Code Examples

Code examples illustrate SQL, PL/SQL, SQL*Plus, or other command-line statements. They are displayed in a monospace (fixed-width) font and separated from normal text as shown in this example:

```
SELECT username FROM dba_users WHERE username = 'MIGRATE';
```

The following table describes typographic conventions used in code examples and provides examples of their use.

Convention	Meaning	Example
[ ]	Brackets enclose one or more optional items. Do not enter the brackets.	`DECIMAL (digits [ , precision ])`
{ }	Braces enclose two or more items, one of which is required. Do not enter the braces.	`{ENABLE | DISABLE}`
|	A vertical bar represents a choice of two or more options within brackets or braces. Enter one of the options. Do not enter the vertical bar.	`{ENABLE | DISABLE}` `[COMPRESS | NOCOMPRESS]`
. . .	Horizontal ellipsis points indicate either: ■ That we have omitted parts of the code that are not directly related to the example ■ That you can repeat a portion of the code	`CREATE TABLE ... AS subquery;` `SELECT col1, col2, ... , coln FROM employees;`
. . .	Vertical ellipsis points indicate that we have omitted several lines of code not directly related to the example.	
Other notation	You must enter symbols other than brackets, braces, vertical bars, and ellipsis points as shown.	`acctbal NUMBER(11,2);` `acct CONSTANT NUMBER(4) := 3;`
Italics	Italicized text indicates placeholders or variables for which you must supply particular values.	`CONNECT SYSTEM/system_password` `DB_NAME = database_name`

UPPERCASE	Uppercase typeface indicates elements supplied by the system. We show these terms in uppercase in order to distinguish them from terms you define. Unless terms appear in brackets, enter them in the order and with the spelling shown. However, because these terms are not case sensitive, you can enter them in lowercase.	`SELECT last_name, employee_id FROM employees;`
		`SELECT * FROM USER_TABLES;`
		`DROP TABLE hr.employees;`

lowercase	Lowercase typeface indicates programmatic elements that you supply. For example, lowercase indicates names of tables, columns, or files.
	Note: Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.
		`SELECT last_name, employee_id FROM employees;`
		`sqlplus hr/hr`
		`CREATE USER mjones IDENTIFIED BY ty3MU9;`

1

Prerequisites for Installing OracleAS TopLink

This chapter provides information that you should review before installing Oracle Application Server TopLink (OracleAS TopLink). It contains the following topics:

1.1 System and Product Requirements

Your computer must meet the following minimum system requirements:

Operating System

OracleAS TopLink will run on any of the following operating systems:

- Microsoft Windows 2000 an XP
- Microsoft Windows NT 4.0 (Service Pack 6) or newer
- Microsoft Windows Server 2003 Datacenter Edition for 64-bit Itanium 2 Systems
- Microsoft Windows Server 2003 Enterprise Edition for 64-bit Itanium 2 Systems
- Any fully Java-compatible UNIX operating system (Solaris)

Hardware Requirements

Although OracleAS TopLink hardware requirements are generally less than the requirements for Java or common database applications, your computer should meet the following minimum guidelines:

- Itanium 2 or higher for each installation type
- Pentium class processor running at a minimum of 300 MHz
- 192 MB of Random Access Memory (RAM)
- 128 MB free on the hard drive

Product Requirements

OracleAS TopLink requires a Java Virtual Machine (JVM) compatible with Java Development Kit (JDK) 1.4.2. OracleAS TopLink is certified with Sun JDK 1.4.2._06.

OracleAS TopLink Examples

The complete installation of OracleAS TopLink includes examples that require a Java 2 SDK to compile and run.

1.2 Supported Databases

OracleAS TopLink is an infrastructure-based solution that simplifies the integration of Java objects to any Java Database Connectivity (JDBC) compliant database. OracleAS TopLink supports JDBC 2.0 drivers that comply with JDBC 2.0 object-relational extensions. Contact your database and JDBC vendor to determine which object-relational extensions they support.

To enable Oracle Application Server TopLink Mapping Workbench to retrieve table information from the database, the database driver must support the following JDBC methods:

- `getTables()`
- `getTablesTypes()`
- `getImportedKeys()`
- `getCatalogs()`
- `getPrimaryKeys()`

1.3 License Information

OracleAS TopLink does not require a license file for the Oracle Application Server TopLink or the OracleAS TopLink Mapping Workbench. However, you are not allowed to ship the OracleAS TopLink Mapping Workbench or expose any of the OracleAS TopLink Application Programming Interface (API) as part of an end-user application. Refer to the software license agreement for information about the limitations on including the OracleAS TopLink Foundation Library JAR files, as a part of a packaged end-user application.

Licensing information is available at the following link:

`http://oraclestore.oracle.com`

1.3.1 Third-Party License Information

OracleAS TopLink uses the following software:

- Apache Ant version 1.5.1
- Antlr version 2.7.0
- DOM
- JRE version 1.4.2

1.3.1.1 Apache Ant version 1.5.1

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 * University of Illinois, Urbana-Champaign.
 */
```

1.3.1.2 Antlr version 2.7.0

OracleAS TopLink uses Another Tool for Language Recognition (Antlr) version 2.7.0 for EJB QL parsing. Antlr is a language tool that provides a framework for constructing recognizers, compilers, and translators from grammatical descriptions containing C++ or Java actions. The Antlr parser and translator generator are fully in the public domain.

The license information about Antlr version 2.7.0 is available at

http://www.antlr.org/rights.html

1.3.1.3 DOM

Document Object Model (DOM) is a specification that defines some programming language-neutral interfaces that can be used to manipulate XML and HTML documents. World Wide Web Consortium (W3C) maintains this specification. It also provides a Java binding for these interfaces. OracleAS TopLink uses this binding to parse and manipulate XML documents.

This program contains third-party code from the W3C. Under the terms of the W3C license, Oracle is required to provide the following notices.

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The license information about DOM is available at

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```

1.3.1.4 JRE version 1.4.2

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1.4 JAWS Screen Reader

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Due to limitations in JAWS 4.5.1, input field labels in the OracleAS TopLink Mapping Workbench are not read properly. Oracle recommends using JAWS 3.7 and version 103 Access Bridge for maximum accessibility.

1.5 Certification Information

The latest certification information for 10*g* Release 2 (10.1.2) is available at

http://metalink.oracle.com

2

Installing and Configuring OracleAS TopLink

This chapter contains information about installing OracleAS TopLink. It contains the following topics:

2.1 OracleAS TopLink Installation Types

The Oracle Universal Installer (OUI) for OracleAS TopLink provides four different installation types. Each installation type is a predefined component set within the OUI that automatically selects the components to install. The installation types that appear on the OUI screen depend on the list that the installation developer specifies for the product.

The four installation types are as follows:

- Complete: This option installs the entire product, including OracleAS TopLink Foundation Library, OracleAS TopLink Mapping Workbench, OracleAS TopLink Sessions Editor, and OracleAS TopLink Examples.
- Mapping and Code Development: This option installs the OracleAS TopLink Foundation Library, OracleAS TopLink Mapping Workbench, and OracleAS TopLink Sessions Editor.
- Code Development: This option installs the OracleAS TopLink Foundation Library for development without the OracleAS TopLink Mapping Workbench and OracleAS TopLink Sessions Editor.
- Runtime: This option installs only the packaged run-time classes.

2.2 Installing OracleAS TopLink

This section describes the procedures to install OracleAS TopLink including the OracleAS TopLink Foundation Library and OracleAS TopLink Mapping Workbench.

This section contains the following topics:

- Installing OracleAS TopLink on Microsoft Windows Operating System
- Performing Silent Installation on Microsoft Windows Operating System
- Installing OracleAS TopLink on UNIX or Other Non-Windows Operating System
- Silent Installation on UNIX or Other Non-Windows Operating System

---

Note: Before installing OracleAS TopLink, back up the existing project data.

2.2.1 Installing OracleAS TopLink on Microsoft Windows Operating System

To start the OUI and install OracleAS TopLink:

1. Ensure that you are logged in to the computer as a member of the Microsoft Windows Administrators group.

   Note: When you configure OracleAS TopLink for use with (Java 2 Platform, Enterprise Edition) J2EE containers, you need to modify the system variables, not the User Variables.

   Java package names are case-sensitive. When you install them on Microsoft Windows, ensure that case sensitivity is turned on.

   For more information, refer to the Microsoft Windows documentation.

   ---

2. Insert the OracleAS TopLink installation disk into the CD-ROM drive to launch OUI.
   - If your computer supports the auto-run feature, then the installer will automatically launch on your computer.
   - If your computer does not support the auto-run feature, then perform the following steps to launch the installer:

   a. Locate the following file:

      `G:\setup.exe`, where `G` is the letter for your CD-ROM drive

   b. Launch the `setup.exe` program to start the installer.

      The Oracle Universal Installer Welcome screen appears. It provides information about the OUI.

3. Click **Next**. The Specify File Locations screen appears.
4. Enter the following information in the fields provided:
   a. Source Path: The default value appears. Do not change this value.
   b. Destination Name: Enter the required Oracle home name.
   c. Destination Path: Browse or enter the path to the directory where you want to install the Oracle Application Server Middle Tier.
5. Click **Next**. The Select Installation Type screen appears.
6. Select **Complete** to install the entire package. The other options available on the screen allow you to perform a partial install. The products that can be installed are mentioned with the options.

7. Click **Next**. The Summary screen appears.
8. After reviewing the Summary screen, click **Install**. This completes the installation and the End of Installation screen appears.
9. Click **Exit** and then click **Yes**. This completes the installation.
10. When the installation is complete, verify and if necessary, edit the `JDBC_CLASSPATH` variable in the *`ORACLE_HOME`*`\toplink\bin\setenv.cmd` file. The `JDBC_CLASSPATH` variable must specify the path to the preferred JDBC drivers.

    If the path to your JDBC driver(s) contains spaces, then the path must be enclosed in double-quotes in the `setenv.cmd` file. For example:

    ```
    set JDBC_CLASSPATH="C:\Program Files\some directory\driver.jar\"
    ```

Note: The `JDBC_CLASSPATH` variable must not include any Java classes for your persistent business objects that are specified in an OracleAS TopLink Mapping Workbench project. Paths for persistent business objects are set within an OracleAS TopLink Mapping Workbench project.

For more information on how to set up a path for a project, refer to *Oracle Application Server TopLink Mapping Workbench User's Guide*.

See Also: Refer to *`ORACLE_HOME`*`\toplink\doc\index.htm` for the latest *OracleAS TopLink Release Notes*

2.2.2 Performing Silent Installation on Microsoft Windows Operating System

The silent installation mode is available for all installation types. You can make use of the silent installation when you wish to make multiple installations simultaneously or when you perform installations from a remote location. Silent installation eliminates the need to monitor the installation because there is no graphical output and no input by the user.

To perform a silent installation:

1. Insert the OracleAS TopLink installation disk into the CD-ROM drive.
2. Open the `\Stage\Response` directory and select the `oracle.toplink.`*`Installation_Type`*`.rsp` response file. For example, if you select the Complete installation type, then the response file would be `complete.rsp`.
3. Copy the `oracle.toplink.`*`Installation_Type`*`.rsp` file to a `temp` folder.
4. Edit the following parameters in the `oracle.toplink.`*`Installation_Type`*`.rsp` file:
   - `ORACLE_HOME`
   - `ORACLE_HOME_NAME`
5. Open a command prompt window and run the following commands:

   `setup.exe -responseFile C:\temp\oracle.toplink.`*`complete`*`.rsp -silent` and press **Enter**.

6. If your installation is successful, then the log file for the silent installation will contain the following line:

   The installation of OracleAS TopLink was successful.

2.2.3 Installing OracleAS TopLink on UNIX or Other Non-Windows Operating System

To start OUI and install OracleAS TopLink on UNIX or other non-Windows operating system, proceed as follows:

1. Insert the OracleAS TopLink installation disk into the CD-ROM.
2. Run OUI from the CD-ROM and follow the OUI instructions.

   Note: Ensure you are not logged in as the `root` user when you start the OUI. If you are, then only the `root` user will have permissions to manage OracleAS TopLink.

   a. Log in as the `oracle` user.

   b. To start the installer, enter the following command at the command prompt:

      ```
      prompt> mount_point/as_1012disk/runInstaller.
      ```

      This launches the OUI with which you install OracleAS TopLink.

      Note: Do not start the installation inside the `mount_point` directory. If you do, then you may not be able to eject the installation disk.

3. When the installation is complete, verify and, if necessary, edit the `JDBC_CLASSPATH` variable in the `setenv.sh` file. The `JDBC_CLASSPATH` variable must specify the path to the preferred JDBC driver.

   You can find the `setenv.sh` file in the *`ORACLE_HOME`*`/toplink/bin` directory.

   Note: The `JDBC_CLASSPATH` variable must not include any Java classes for your persistent business objects that are specified in an OracleAS TopLink Mapping Workbench project. Paths for persistent business objects are set within an OracleAS TopLink Mapping Workbench project.

   See Also: *Oracle Application Server TopLink Mapping Workbench User's Guide* for more information on how to set up a path for a project

4. Refer to *`ORACLE_HOME`*`/toplink/doc/index.htm` for the latest *OracleAS TopLink Release Notes*.

2.2.4 Silent Installation on UNIX or Other Non-Windows Operating System

The steps for a silent installation on UNIX or other non-Windows operating systems are:

1. Insert the OracleAS TopLink installation disk into the CD-ROM drive.

2. Open the `/Stage/Response` directory and select the *`oracle.toplink.Installation_Type.rsp`* file.
3. Copy the *`oracle.toplink.Installation_Type.rsp`* file to a temp folder.
4. Edit the following parameters in the *`oracle.toplink.Installation_Type.rsp`* file:
   - `ORACLE_HOME`
   - `ORACLE_HOME_NAME`
   - `GROUP_NAME`
   - `FROM_LOCATION`
5. Open a command prompt window and enter `./runInstaller -responseFile /tmp/oracle.toplink.`*`Installation_Type`*`.rsp -silent` and press Enter.
6. If your installation was successful, the `silentInstall.log` file contains the following line:

   ```
   The installation of OracleAS TopLink was successful.
   ```

2.3 Configuring the OracleAS TopLink Examples

The complete OracleAS TopLink installation includes the OracleAS TopLink examples. These examples help you explore and learn how to use the OracleAS TopLink features with different architectures and different technologies. They are designed to be as simple as possible while still effectively demonstrating the target architecture, technology, or feature.

There are two types of examples, Oracle Application Server and OracleAS TopLink Foundation Library (non-server) examples.

- Oracle Application Server examples vary from server to server, depending on the server-specific features. Although OracleAS TopLink provides instructions for certain servers, you can run many of the examples (for example, the Session Bean and Servlet JSP examples) on other application servers with some configuration changes.
- OracleAS TopLink Foundation Library (non-server) examples are configured to run in a simple Java Virtual Machine (JVM), but the features and technologies they demonstrate can also be used in an application server environment.

When you run the examples, useful information is written to standard output, including details about what the example is doing and what SQL is generated. You may find it useful to redirect standard output to a file when you run an example.

Although the OracleAS TopLink examples require little configuration, ensure that you read and verify the configuration details included in the *Configuring the Examples* document before you run the examples.

> **See Also:** *Configuring the Examples* document, which can be accessed at *`ORACLE_HOME`*`\toplink\doc\examples\config\config.htm`

When the configuration is complete, each of the OracleAS TopLink examples has a readme file with specific information on how to build and run the example.

For known issues with OracleAS TopLink examples, refer to "Troubleshooting Known Issues" sections in the *Oracle Application Server TopLink Application Developer's Guide*.

2.4 Configuring OracleAS TopLink for Oracle JDeveloper

This section contains information on how to configure OracleAS TopLink for Oracle JDeveloper.

Oracle JDeveloper is a J2EE development environment with end-to-end support to develop, debug, and deploy e-business applications and Web Services.

When you use OracleAS TopLink with Oracle JDeveloper, use the following procedures to add the OracleAS TopLink JAR files to your JDeveloper projects:

Creating an OracleAS TopLink JDeveloper Library:

1. Select a JDeveloper project in the System Navigator pane.
2. Select **Project**, click **Project Settings**.

   The Project Settings pane appears.
3. Click **Configurations**, **Development**, and then **Libraries**. A list of predefined and user-defined libraries appears.
4. Click **New** to create a new library, which will contain the OracleAS TopLink `.jar` files.

   The New Library dialog box appears.
5. Enter a name for the new library, for example, OracleAS TopLink. Ensure that the default choice for libraries remains as User Libraries.
6. To edit the classpath and add the OracleAS TopLink `.jar` files, click the **Edit** button.

   Add the following to the beginning of the classpath:

   ```
   ORACLE_HOME\toplink\jlib\toplink.jar
   ORACLE_HOME\toplink\jlib\antlr.jar
   ORACLE_HOME\lib\xmlparserv2.jar
   ```
7. Click **OK**. On the **Project Settings** pane click **OK**.

Use an Existing User-Defined OracleAS TopLink Library:

After a user library is created, it can be re-referenced by any other project. Revisit the Libraries window of the Project Settings, and add the OracleAS TopLink Library to any project with which you want to use OracleAS TopLink.

2.5 Sun JDK and JRE

On a Microsoft Windows-based platform, OracleAS TopLink includes the Java Runtime Environment (JRE) 1.4.2. OracleAS TopLink is certified with Sun JDK 1.4.2_06 for use by the OracleAS TopLink Mapping Workbench.

At runtime, the OracleAS TopLink Foundation Library requires a JVM compatible with JDK 1.4.2 or later. OracleAS TopLink is certified with Sun JDK 1.4.2_06 for use by the OracleAS TopLink Foundation Library.

To configure OracleAS TopLink for a different version of the JRE, change the `setenv.cmd` file to point `JRE_HOME` to the alternate directory.

To compile and run the OracleAS TopLink Examples, you must have a Java 2 SDK installed.

> **See Also:** Section 2.3, "Configuring the OracleAS TopLink Examples" for more information about how to configure and run the OracleAS TopLink Examples

JCE

The OracleAS TopLink Mapping Workbench and OracleAS TopLink Sessions Editor use Java Cryptography Extension (JCE) to encrypt database login information. JCE is included with JDK 1.4.2. If you use JDK 1.1.3 or higher, then select one of the following options:

- Download and install the Sun JCE plug-in from `http://java.sun.com/products/jce/`
- Do not store password information in OracleAS TopLink Mapping Workbench or OracleAS TopLink Sessions Editor. Instead, manually add the password in the code or edit the generated project file.

2.6 Installing Patch Sets

The 10*g* Release 2 (10.1.2) release includes changes introduced in all previously released patch sets for Release 2 (9.0.4) up to and including patch set Release 2 (9.0.4.7).

When available, you can download the latest patch sets for 10*g* Release 2 (10.1.2) from *OracleMetaLink* at

`http://metalink.oracle.com`

OracleMetaLink is the Oracle Support Services site where customers can get information about released patches and outstanding bugs.

2.7 General Troubleshooting

After you install OracleAS TopLink, if you encounter problems either starting the application or connecting to a database, then try the following solutions:

- Ensure that the driver class name is correct. Many vendors have several driver classes to choose from.
- Check your login information.
- Ensure that your path includes all the `.dll` files that your driver requires.
- Check with your database administrator that:
  - drivers that require special setup in the database server have been set correctly.
  - drivers that require special permissions in the database server have been set up correctly.
  - You are not exceeding the number of available concurrent connections to your database. This may occur during development time, when many people are testing connections.
  - You are not exceeding the number of available concurrent connections to your database. This may occur during development time, when many people are testing connections.

- If you use database servers that require an extra Microsoft Windows service to be running for JDBC connections, then ensure that the service is running.

3

Migrating to 10*g* Release 2 (10.1.2)

For users that have not previously migrated to Release 2 (9.0.3), this chapter describes how to migrate existing 2.x, 3.x and 4.x projects to Oracle Application Server TopLink 10*g* Release 2 (10.1.2). This chapter includes the following sections:

3.1 Upgrading OracleAS TopLink Mapping Workbench Projects

Use the following procedures to upgrade your project from a previous version of the OracleAS TopLink Mapping Workbench.

From Release 2 (9.0.3)

Open and save the project with 10*g* Release 2 (10.1.2).

> **Note:** In Release 2 (9.0.4), enhancements to the OracleAS TopLink Mapping Workbench included a significant reduction of XML files. If you are using the OracleAS TopLink Mapping Workbench with a source control management (SCM) system in Release 2 (9.0.3) projects, many files in the SCM will no longer be valid in 10*g* Release 2 (9.0.4.x) /10*g* Release 2 (10.1.2).

From Version 4.x

Use the "Package Rename" procedures on page 3-2 and open the project with 10*g* Release 2 (10.1.2).

From Version 3.6

Use the "Package Rename" procedures on page 3-2 and open the project with 10*g* Release 2 (10.1.2).

From Versions 2.x, 3.0 or 3.5

If you are migrating an OracleAS TopLink Mapping Workbench project from a version prior to version 3.6, contact Oracle Support Services support for assistance at OracleMetaLink.

`http://metalink.oracle.com`

Note: The **Default Null** value for object type mappings was expanded (starting with version 4.6) to differentiate between *default* and *null* values. If your 3.6 project contains object type mappings ensure that the default and null values are set properly on the mapping's **General** tab. For more information, see the *Oracle Application Server TopLink Mapping Workbench User's Guide*.

Note: If you receive `ClassNotFound` exceptions after you migrate a project, ensure the `JDBC_CLASSPATH` variable does not include any Java classes for your persistent business objects. Paths for persistent business objects are set within an OracleAS TopLink Mapping Workbench project. For more information on how to set up a path for a project, see the *Oracle Application Server TopLink Mapping Workbench User's Guide*.

Also check your project classes for any references to legacy OracleAS TopLink classes.

3.2 Package Rename

Beginning with Release 2 (9.0.3), the base package for the entire structure became **`oracle.toplink`**. To upgrade existing application source code which refers to OracleAS TopLink API packages and existing OracleAS TopLink Mapping

Workbench projects previous to Release 2 (9.0.3), you must use the **Package Rename** tool.

Use the Package Rename tool on your:

- Source code
- Configuration files
- OracleAS TopLink Mapping Workbench project files that contain references to pre-Release 2 (9.0.3) API packages

The Package Rename tool works on plain text files and must not be used with binary files such as `jar` files.

3.2.1 Running the Package Rename Tool

Use this procedure to upgrade your existing pre-Release 2 (9.0.3) application source code and OracleAS TopLink Mapping Workbench projects to version 10*g* Release 2 (10.1.2).

1. At the command prompt, execute the `packageRename.cmd/sh` program located in the `ORACLE_HOME/toplink/bin` directory. You need to specify three parameters on the command line:
   - the complete directory path that contains the Java source code of your existing project
   - the complete directory path that will contain the upgraded 10*g* Release 2 (10.1.2) project
   - the name of a log file. If no file is specified, the logging messages will print to standard output.
2. Press **Enter** and the Package Rename tool will upgrade your project. The Package Rename tool requires approximately 15 minutes for a 1MB file. Larger files may require additional time.
3. Repeat this procedure for your:
   - Source code
   - Configuration files
   - OracleAS TopLink Mapping Workbench project files (`*.mwp`, `*.xml`)

3.3 Name Changes

Table 3–1, Table 3–2, Table 3–3 and Table 3–4 identify the name changes between version 4.x and 10*g* Release 2 (10.1.2).

Table 3–1 New Package Names

Version 4.x	Release 2 (9.0.3)	10*g* Release 2 (9.0.4) and 10*g* Release 2 (10.1.2)
`com.webgain.integrator`	`oracle.toplink`	`oracle.toplink`
`com.webgain.workbench`	`oracle.toplink.workbench`	`oracle.toplink.workbench`
`com.webgain.openapi.foundation`	`oracle.toplink.uitools`	`oracle.toplink.uitools`

Table 3–2 New Class Names

Version 4.x	Release 2 (9.0.3)	10*g* Release 2 (9.0.4) and 10*g* Release 2 (10.1.2)
`WDIException.java`	`TopLinkException.java`	`TopLinkException.java`

Table 3–3 New JAR/WAR Names

Version 4.x	Release 2 (9.0.3)	10*g* Release 2 (9.0.4) and 10*g* Release 2 (10.1.2)
`wdiall.jar`	`toplink.jar`	`toplink.jar`
`wdi.jar`	`tl_core.jar`	*not applicable*
`wdisdk.jar`	`tl_sdk.jar`	*not applicable*
`wdisdkxerces.jar`	`tl_sdkx.jar`	*not applicable*
`wditools.jar`	`tl_tools.jar`	*not applicable*
`wdix.jar`	`tl_x.jar`	*not applicable*
`wdiwasx.jar`	`tl_wasx.jar`	*not applicable*
`wdiwlsx.jar`	`tl_wlsx.jar`	*not applicable*
`workbench.jar`	`workbench.jar`	`toplinkmw.jar`
`TopLinkWebClient.war`	`tl_webclient.war`	`toplinkwc.war`
`wdidemo.jar`	`tl_demo.jar`	*not applicable*
`wdidemoui.jar`	`tl_tour.jar`	*not applicable*

Table 3–4 New XML/DTD Files

Version 4.x	Release 2 (9.0.3)	10*g* Release 2 (9.0.4) and 10*g* Release 2 (10.1.2)
`wdi-ejb-jar.xml`	`toplink-ejb-jar.xml`	`toplink-ejb-jar.xml`
`wdi-was-ejb-jar_45.dtd`	`toplink-was-ejb-jar_903.dtd`	`toplink-was-ejb-jar_904.dtd`
`wdi-wls-ejb-jar_40.dtd`	`toplink-wls-ejb-jar_903.dtd`	`toplink-wls-ejb-jar_904.dtd`

3.4 Updating Sessions XML Files

OracleAS TopLink 10*g* Release 2 (10.1.2) is backward compatible with previous releases however, you must update the DOCTYPE headers for the Sessions XML files to read as follows:

Table 3–5 Sessions.xml

DocType	DTD Used From the Classpath
"-//Oracle Corp.//DTD TopLink for JAVA 4.0//EN"	sessions_4_0.dtd
"-//Oracle Corp.//DTD TopLink for JAVA 4.5//EN"	sessions_4_5.dtd
"-//Oracle Corp.//DTD TopLink Sessions 9.0.4//EN"	sessions_9_0_4.dtd

Table 3–6 WAS toplink-ejb-jar.xml

DocType	DTD Used From the Classpath
"-//Oracle Corp.//DTD TopLink 4.5 CMP for WebSphere//EN"	toplink-was-ejb-jar_903.dtd
"-//Oracle Corp.//DTD TopLink CMP WebSphere 9.0.4//EN"	toplink-was-ejb-jar_904.dtd

Table 3–7 WLS toplink-ejb-jar.xml

DocType	DTD Used From the Classpath
"-//Oracle Corp.//DTD TopLink 4.0 CMP for WebLogic//EN"	toplink-wls-ejb-jar_903.dtd
"-//Oracle Corp.//DTD TopLink CMP WebLogic 9.0.4//EN"	toplink-wls-ejb-jar_904.dtd

Glossary

This glossary contains terms and abbreviations that you should be familiar with when using OracleAS TopLink.

attribute

A variable of a class or object. In OracleAS TopLink, *attribute* describes all instance variables of a class. Every attribute contains a single mapping.

bean class

The implementation of the bean. The bean is accessed from the client using the home and remote interfaces.

branch class

A class that consists of a persistent superclass and also has subclasses. By default, queries performed on the branch class return instances of the branch class and any of its subclasses. However, the branch class can be configured so that queries on it return only instances of itself without instances of its subclasses.

Compare to leaf class.

class

A category of objects. Classes allow data and methods to be grouped together.

class indicator field

A field in the table of the root class that indicates which subclass should be instantiated.

custom SQL

Any non-OracleAS TopLink-generated SQL used through OracleAS TopLink. This includes hard-coded SQL and stored procedure calls.

Data Definition Language (DDL)

A language that is a part of the SQL. OracleAS TopLink Mapping Workbench can generate DDL scripts that can be used to create tables on the desired database.

dependent classpath

A location where non-bean classes are specified. OracleAS TopLink requires that the bean classes be included here as they are referenced by the project.

descriptor

An OracleAS TopLink object that describes how the attributes and relationships of an object are to be represented in relational database tables. An OracleAS TopLink descriptor is not the same as a deployment descriptor, although it plays a similar role.

direct access

By default, OracleAS TopLink accesses public attributes directly when writing the attributes of the object to the database or reading the attributes of the object from the database.

Compare to method access.

direct mapping

There are two basic ways of storing object attributes directly in a table:

- The information can be stored directly if the attribute type is comparable to a database type.
- If there is no database primitive type that is logically comparable to the attributes type, then it must be transformed on its way to and from the database

OracleAS TopLink provides five classes of direct mappings.

Compare to relationship mapping.

expressions

The OracleAS TopLink equivalent of an SQL conditional clause

OracleAS TopLink expressions are specified using the `Expression` and `ExpressionBuilder` classes.

identity map

A map used to cache objects for performance and to maintain object identity.

Compare to object identity.

independent relationship

A relationship in which the source and target are public objects that exist independently. The destruction of one object does not necessarily imply the destruction of the other.

Compare to private relationship.

indirection

An indirection object is one that acts as a stand-in for another object. In OracleAS TopLink, indirection is implemented through Value Holders, which delay database access by acting as stand-ins for any object relationships.

inheritance

Describes how a child class inherits the characteristics of its parent class. OracleAS TopLink supports multiple approaches to database implementations that preserve the inheritance relationship.

J2SE

The Java 2 Platform, Standard Edition (J2SE) is the core Java technology platform. It provides software compilers, tools, runtimes, and APIs for writing, deploying, and running applets and applications in Java.

J2EE

The Java 2 Platform, Enterprise Edition (J2EE) is an environment for developing and deploying enterprise applications. J2EE includes a set of services, APIs, and protocols for developing multi-tier Web-based applications.

J2EE containers

A J2EE container is a run-time environment for Enterprise JavaBeans (EJBs) that includes such basic functions as security, life cycle management, transaction management, and deployment services. J2EE containers are usually provided by a J2EE server, such as Oracle Application Server Containers for J2EE.

Java Data Objects

Java Data Objects (JDO) represent a standard Java model for persistence that enables programmers to create code in Java that transparently accesses the underlying data store without using database-specific code. OracleAS TopLink provides support for most of the JDO specification, however, because OracleAS TopLink is a persistence framework, you may find it easier and more effective to build your applications using OracleAS TopLink functionality rather than JDO.

Java Transaction API Support

The Java Transaction API (JTA) specifies the interfaces between a transaction manager, a resource manager, an application server, and transactional applications involved in a distributed transaction system.

leaf class

A leaf class has a persistent superclass in the hierarchy but does not have subclasses. Queries performed on the leaf class can return only instances of the leaf class.

Compare to branch class.

method access

The application registers accessor methods for the attribute.

Compare to direct access.

object identity

Ensures that each object is represented by one and only one instance in the application. Multiple retrievals of the same object return references to the same object instance and not multiple copies of the same object. Violating object identity can corrupt the object model.

Compare to identity map.

optimistic locking

Also known as write locking. It allows unlimited read access to objects. A client can write an object to the database only if the object has not changed while it was last read.

Compare to pessimistic locking.

pessimistic locking

Objects are locked before they are edited, which ensures that only one client is editing the object at any given time.

Compare to optimistic locking.

private relationship

A relationship in which the target object is considered to be a private component of the source object. The target object cannot exist without the source and is accessible only through the source object. In addition, if the source object is destroyed, then the target object is destroyed as well.

Compare to independent relationship.

Project Tree

The main interface of OracleAS TopLink Mapping Workbench. The Project Tree shows the high-level information stored in a project.

query manager

An object that controls the way the descriptor accesses the database. It is owned by a descriptor. The query manager generates its own default SQL to access the database in a transparent manner.

query optimization

OracleAS TopLink supports two forms of query optimization, joining and batch reading. Their purpose is to optimize database access by reducing the number of database calls required to read a group of objects.

relationship

In OracleAS TopLink, a reference between two OracleAS TopLink-enabled objects.

relationship mapping

Persistent objects use relationship mappings to store references to instances of other persistent classes. The appropriate mapping class is chosen primarily by the cardinality of the relationship. OracleAS TopLink provides five classes of relationship mappings.

Compare to direct mapping.

unit of work

A transactional OracleAS TopLink session that allows for a transaction to occur at the database level and the object level. Changes to objects are not visible globally until the unit of work is committed.

value holder

A wrapping object used by OracleAS TopLink to delay database access.

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