

Oracle® Application Server TopLink

Getting Started Guide

10g (9.0.4)

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Oracle Application Server TopLink Getting Started Guide, 10g (9.0.4)

Part No. B10315-01

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Primary Author: Jacques-Antoine Dubé

Contributing: Rick Sapir, Ellen Siegal (Editor)

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Contents

Send Us Your Comments	v
Preface.....	vii
Intended Audience	viii
Documentation Accessibility	viii
Organization.....	ix
Related Documentation	ix
Conventions.....	x
1 Before You Install	
System and Product Requirements	1-2
Supported Databases	1-2
License Information	1-3
Third-Party License Information.....	1-3
Apache Ant v 1.5.1	1-3
ANTLR v 2.7.0.....	1-5
DOM.....	1-5
Java Runtime Environment v 1.4.1	1-7
Certification Information	1-7
2 Installing and Configuring OracleAS TopLink	
OracleAS TopLink Installation Types	2-2
Installing OracleAS TopLink	2-2
Installing OracleAS TopLink on Windows Operating System.....	2-3

Silent Installation on Windows Operating System.....	2-4
Installing OracleAS TopLink on UNIX or other non-Windows Operating System	2-5
Silent Installation on UNIX or other non-Windows Operating System	2-6
Configuring the OracleAS TopLink Examples	2-7
Configuring OracleAS TopLink for Oracle JDeveloper.....	2-7
Sun JDK and JRE	2-8
General Troubleshooting.....	2-9
Installing Patch Sets	2-10

3 Migrating to 10g (9.0.4)

Upgrading OracleAS TopLink Mapping Workbench Projects	3-2
Package Rename.....	3-3
Running the Package Rename Tool	3-4
Name Changes.....	3-4
Updating Sessions XML Files.....	3-6

Glossary

Index

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Oracle Application Server TopLink Getting Started Guide, 10g (9.0.4)

Part No. B10315-01

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Preface

This document provides installation procedures to install and configure Oracle Application Server TopLink. It also introduces the concepts with which you should be familiar to get the most out of OracleAS TopLink.

This preface contains these topics:

- [Intended Audience](#)
- [Documentation Accessibility](#)
- [Organization](#)
- [Related Documentation](#)
- [Conventions](#)

Intended Audience

The *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 particular operating system (such as 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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Accessibility of Code Examples in Documentation JAWS, a Windows screen reader, may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, JAWS may not always read a line of text that consists solely of a bracket or brace.

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Organization

This document includes the following chapters:

Chapter 1, "Before You Install"

This chapter contains important prerequisites information.

Chapter 2, "Installing and Configuring OracleAS TopLink"

This chapter contains instructions for installing and configuring OracleAS TopLink.

Chapter 3, "Migrating to 10g (9.0.4)"

This chapter contains instructions on how to migrate existing OracleAS TopLink 2.x, 3.x and 4.x projects to Oracle Application Server TopLink 10g (9.0.4).

"Glossary"

Provides definitions for words and phrases commonly used in OracleAS TopLink.

Related Documentation

For more information, see these Oracle resources:

- *Oracle Application Server TopLink Release Notes*
- *Oracle Application Server 10g 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*

Printed documentation is available for sale in the Oracle Store at

<http://oraclestore.oracle.com>

To download free release notes, installation documentation, white papers, or other collateral, please visit the Oracle Technology Network (OTN). You must register online before using OTN; registration is free and can be done at

<http://otn.oracle.com/membership>

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

<http://otn.oracle.com/docs>

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
<i>Italics</i>	Italic typeface indicates book titles or emphasis.	<i>Oracle9i Database Concepts</i> Ensure that the recovery catalog and target database do <i>not</i> 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, RMAN keywords, SQL keywords, SQL*Plus or utility commands, packages and methods, as well as system-supplied column names, database objects and structures, usernames, 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, usernames 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.

Convention	Meaning	Example
<i>lowercase italic monospace (fixed-width) font</i>	Lowercase italic monospace font represents placeholders or variables.	You can specify the <i>parallel_clause</i> . Run <i>Uold_release</i> .SQL where <i>old_release</i> 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 (<i>digits</i> [, <i>precision</i>])
{ }	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: <ul style="list-style-type: none"> 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 <i>subquery</i> ; SELECT <i>col1</i> , <i>col2</i> , ... , <i>coln</i> 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;

Convention	Meaning	Example
<i>Italics</i>	Italicized text indicates placeholders or variables for which you must supply particular values.	CONNECT SYSTEM/ <i>system_password</i> DB_NAME = <i>database_name</i>
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;

Before You Install

This chapter includes the following information that you should review before you install Oracle Application Server TopLink:

- [System and Product Requirements](#)
- [Supported Databases](#)
- [License Information](#)
- [Certification Information](#)

System and Product Requirements

Your system must meet the following minimum requirements:

Operating System

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

- Windows 2000
- Windows NT 4.0 (Service Pack 6) or newer
- 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 system should meet the following minimum guidelines:

- Pentium class processor running at a minimum of 300 MHz
- 192 MB of random access memory (RAM)
- 128 MB free on your hard drive

Product Requirements

OracleAS TopLink requires a Java Virtual Machine (JVM) compatible with JDK 1.3 or higher.

OracleAS TopLink Examples

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

Supported Databases

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

In order for the 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 ()`

License Information

OracleAS TopLink does not require a license file for the OracleAS TopLink Foundation Library 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 APIs as part of an end-user application. Refer to the software license agreement for information about the limitations on including the Oracle Application Server TopLink Foundation Library JAR files, as part of a packaged end-user application.

Licensing information is available at

<http://oraclestore.oracle.com>

Third-Party License Information

OracleAS TopLink uses the following software:

Apache Ant v 1.5.1

<http://jakarta.apache.org/ant/index.html>

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```



```

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* Portions of this software are based upon public domain software
* originally written at the National Center for Supercomputing
Applications,
* University of Illinois, Urbana-Champaign.
*/

```

ANTLR v 2.7.0

<http://www.antlr.org>

OracleAS TopLink uses ANTLR for EJB QL parsing. Antlr (ANother Tool for Language Recognition), 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 is fully in the public domain.

DOM

<http://www.w3.org/Consortium/Legal/copyright-software.html>

The Document Object Model (DOM) is a specification that defines some programming language-neutral interfaces that can be used to manipulate XML and HTML documents. W3C maintains this specification. W3C 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 World Wide Web Consortium (“W3C”). Under the terms of the W3C license, Oracle is required to provide the following notices. Note, however, that the Oracle program license that accompanied this product determines your right to use the Oracle program, including the W3C software, and the terms contained in the following notices do not change those rights.

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Java Runtime Environment v 1.4.1

<http://java.sun.com/j2se/1.4.1>

The Java Runtime Environment is maintained by Sun Microsystems, Inc. The OracleAS TopLink Mapping Workbench runs in a Windows JDK 1.4.1 Virtual Machine (VM) by default, and may also be configured to run using other compliant Java 2 VMs. Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc., in the U.S. and other countries.

Certification Information

The latest certification information for 10g (9.0.4) is available at

<http://metalink.oracle.com>

Installing and Configuring OracleAS TopLink

This chapter includes the following information to install Oracle Application Server TopLink:

- [OracleAS TopLink Installation Types](#)
- [Installing OracleAS TopLink](#)
- [Configuring the OracleAS TopLink Examples](#)
- [Configuring OracleAS TopLink for Oracle JDeveloper](#)
- [Sun JDK and JRE](#)
- [General Troubleshooting](#)
- [Installing Patch Sets](#)

OracleAS TopLink Installation Types

The Oracle Universal Installer for OracleAS TopLink provides four different installation types. The installation types is a pre-defined component set within the Oracle Universal Installer that automatically selects which components to install. The Installation types that appear in the Oracle Universal Installer screen depend on the list that the installation developer specified for this particular product.

The four installation types include:

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 runtime classes.

Installing OracleAS TopLink

Use the following procedures to install OracleAS TopLink (including the OracleAS TopLink Foundation Library and OracleAS TopLink Mapping Workbench). Before you install OracleAS TopLink, back up all existing project data.

Note: If you are upgrading from a version previous to Release 2 (9.0.3), you must convert the package names before you open your OracleAS TopLink project(s) in 10g (9.0.4). Refer to "[Package Rename](#)" on page 3-3 for more information.

Installing OracleAS TopLink on Windows Operating System

To start the Oracle Universal Installer and install OracleAS TopLink on a Windows Operating System, proceed as follows:

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

Note: When you configure OracleAS TopLink for use with J2EE containers, you will also need to modify the **System Variables**—not the **User Variables**.

Java package names are case-sensitive. When you install under Windows, make sure case sensitivity is turned on.

For more information, consult your Microsoft Windows documentation.

2. Insert the OracleAS TopLink installation disk into the CD-ROM drive to launch Oracle Universal Installer.
 - If your computer supports the auto run feature, the installer will automatically launch on your computer.
 - If your computer does not support the auto run feature, 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.
This launches the Oracle Universal Installer with which you can install OracleAS TopLink.
3. 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 driver(s).

Caution: 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, see the *Oracle Application Server TopLink Mapping Workbench User's Guide*.

4. Refer to `<ORACLE_HOME>\toplink\doc\index.htm` for the latest Oracle Application Server TopLink Release Notes.

Silent Installation on Windows Operating System

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.

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

FROM_LOCATION

5. Open a command prompt window and enter `setup.exe -responseFile C:\temp\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."

Installing OracleAS TopLink on UNIX or other non-Windows Operating System

To start the Oracle Universal Installer 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 Oracle Universal Installer from the CD-ROM and follow the Oracle Universal Installer instructions.

Note: Be sure you are not logged in as the root user when you start the Oracle Universal Installer. 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:

```
prompt> mount_point/as_904disk/runInstaller.
```

This launches the Oracle Universal Installer 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(s).

You can find the setenv.sh file in the <ORACLE_HOME>/toplink/bin directory.

Caution: 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, see the *Oracle Application Server TopLink Mapping Workbench User's Guide*.

4. Refer to `<ORACLE_HOME>/toplink/doc/index.htm` for the latest Oracle Application Server TopLink Release Notes.

Silent Installation on UNIX or other non-Windows Operating System

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.

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 tmp 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."

Configuring the OracleAS TopLink Examples

The complete OracleAS TopLink installation includes the OracleAS TopLink Examples. These examples help users explore and learn about 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: application server and OracleAS TopLink Foundation Library (non-server) examples.

- 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 VM, 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 out, including details about what the example is doing and what SQL is generated. You may find it useful to redirect standard out 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. For more information on how to run and configure the examples, see *Configuring the Examples* at `<ORACLE_HOME>\toplink\doc\examples\config\config.htm`.

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

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**, choose **Project Settings**.
The Project Settings pane appears.
3. Select **Configurations**, choose **Development**, then choose **Libraries**.
A list of pre-defined 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 **Class Path** and add the OracleAS TopLink . jar files, click the **Edit** button.
Add the following to the beginning of your **Class Path**:

```
<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.

Sun JDK and JRE

On a Windows-based platform, OracleAS TopLink includes the Java Runtime Environment 1.4.1 from Sun Microsystems for use by the OracleAS TopLink Mapping Workbench.

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

At runtime, the OracleAS TopLink Foundation Library requires a JVM compatible with JDK 1.3 or higher.

To compile and run the OracleAS TopLink Examples, you must have a Java 2 SDK installed. For more information on how to configure and run the OracleAS TopLink Examples, see "[Configuring the OracleAS TopLink Examples](#)" on page 2-7.

Java Cryptography Extension (JCE)

The OracleAS TopLink Mapping Workbench and OracleAS TopLink Sessions Editor use JCE to encrypt database login information. JCE is included with JDK 1.4. If you use JDK 1.3.1 or higher, 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 the OracleAS TopLink Mapping Workbench or OracleAS TopLink Sessions Editor. Instead, manually add the password in code or edit the generated project file.

General Troubleshooting

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

- Ensure that the driver class name is correct. Many vendors have several different driver classes to choose from.
- Check your login information.
- Ensure that your path includes all .dll files your driver requires.
- Check with your database administrator that:
 - Any drivers that require special set-up in the database server (such as Sybase JConnect) have been set up correctly.
 - Any 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.
- If you use database servers that requires an extra Windows NT service to be running for JDBC connections, ensure that one is running.
- Check with your vendor to ensure that you are using the latest version of both your JDBC driver and the database to which it is connecting.

Installing Patch Sets

The 10g (9.0.4) release includes changes introduced in previously released patch sets for Release 2 (9.0.3.), namely:

- Release 2 (9.0.3.1)
- Release 2 (9.0.3.2)
- Release 2 (9.0.3.3)
- Release 2 (9.0.3.4)

When available, you can download the latest patch sets for 10g (9.0.4) 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.

Migrating to 10g (9.0.4)

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 10g (9.0.4). This chapter includes the following sections:

- [Upgrading OracleAS TopLink Mapping Workbench Projects](#)
- [Package Rename](#)
- [Name Changes](#)
- [Updating Sessions XML Files](#)

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 10g (9.0.4).

Note: In 10g (9.0.4), enhancements to the OracleAS TopLink Mapping Workbench include 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 10g (9.0.4).

From 4.x

Use the "Package Rename" procedures on page 3-3 and open the project with 10g (9.0.4).

From 3.6

Use the "Package Rename" procedures on page 3-3 and open the project with 10g (9.0.4).

From 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 `ClassNotFoundException` exceptions after you migrate a project, ensure `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.

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.

Note: If you are upgrading from a version previous to Release 2 (9.0.3), you must convert the package names before you open your OracleAS TopLink project(s) in 10g (9.0.4).

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 *should not* be used with binary files (such as `.jar`).

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 10g (9.0.4).

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 10g (9.0.4) 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`)

Name Changes

[Table 3–1](#), [Table 3–2](#), [Table 3–3](#) and [Table 3–4](#) identify the name changes between version 3.x and 10g (9.0.4).

Table 3–1 New Package Names

Version 3.x	Version 4.x	Release 2 (9.0.3)	10g (9.0.4)
TOPLink.Public	com.webgain.integrator	oracle.toplink	oracle.toplink
TOPLink.Private			
<i>not applicable</i>	com.webgain.workbench	oracle.toplink. workbench	oracle.toplink. workbench
<i>not applicable</i>	com.webgain.openapi. foundation	oracle.toplink. uitools	oracle.toplink. uitools

Table 3–2 New Class Names

Version 3.x	Version 4.x	Release 2 (9.0.3)	10g (9.0.4)
TOPLinkException. java	WDIException.java	TopLinkException. java	TopLinkException. java

Table 3–3 New JAR/WAR Names

Version 3.x	Version 4.x	Release 2 (9.0.3)	10g (9.0.4)
toplinall.jar (starting in 3.5)	wdiall.jar	toplinall.jar	toplinall.jar
toplinall.jar	wdi.jar	tl_core.jar	<i>not applicable</i>
toplinall_sdk.jar	wdisdk.jar	tl_sdk.jar	<i>not applicable</i>
toplinall_sdkxerces.jar	wdisdkxerces.jar	tl_sdkx.jar	<i>not applicable</i>
tools.jar	wditools.jar	tl_tools.jar	<i>not applicable</i>
toplinallx.jar	wdix.jar	tl_x.jar	<i>not applicable</i>
toplinall_wsx.jar	wdiwasx.jar	tl_wasx.jar	<i>not applicable</i>
toplinall_wlsx.jar	wdiwlsx.jar	tl_wlsx.jar	<i>not applicable</i>
workbench.jar	workbench.jar	workbench.jar	toplinall_mw.jar
<i>not applicable</i>	TopLinkWebClient.war	tl_webclient.war	toplinall_wc.war
<i>not applicable</i>	wdidemo.jar	tl_demo.jar	<i>not applicable</i>
<i>not applicable</i>	wdidemoui.jar	tl_tour.jar	<i>not applicable</i>

Table 3–4 New XML/DTD Files

Version 3.x	Version 4.x	Release 2 (9.0.3)	10g (9.0.4)
<i>not applicable</i>	wdi-ejb-jar.xml	toplinall-ejb-jar.xml	toplinall-ejb-jar.xml
<i>not applicable</i>	wdi-was-ejb-jar_45.dtd	toplinall-was-ejb-jar_903.dtd	toplinall-was-ejb-jar_904.dtd
<i>not applicable</i>	wdi-wls-ejb-jar_40.dtd	toplinall-wls-ejb-jar_903.dtd	toplinall-wls-ejb-jar_904.dtd

Updating Sessions XML Files

OracleAS TopLink 10g (9.0.4) 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 Class Path
"-//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 Class Path
"-//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 Class Path
"-//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 Oracle Application Server 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

Has 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 method 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

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

data definition language (DDL)

The data definition part of the structured query language (SQL). OracleAS TopLink Mapping Workbench can generate DDL creation scripts that can be used to create tables on the desired database.

dependent class path (IBM WebSphere)

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

descriptors

An OracleAS TopLink object that describes how an object's attributes and relationships are to be represented in relational database table(s). 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 attribute's type, 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

Used to cache objects for performance and to maintain object identity.

See also [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 through acting as stand-in 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-tiered web-based applications.

J2EE Containers

A J2EE container is a runtime 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, but, 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

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; that is, multiple retrievals of the same object return references to the same object instance, not multiple copies of the same object. Violating object identity can corrupt the object model.

See also [identity map](#).

optimistic locking

Also known as write locking; allows unlimited read access to objects. A client can write an object to the database only if the object has not changed since 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 via the source object; furthermore, if the source object is destroyed, the target object is destroyed as well.

Compare to [independent relationship](#).

Project Tree

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

query manager

An object, owned by a descriptor, that controls the way the descriptor accesses the database. 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 through 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 object level not only the database 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.

Index

A

Antlr v 2.7.0
 licensing, 1-5
Apache Ant v 1.5.1
 licensing, 1-3

C

certification, 1-7
configuring
 development environment, 2-7
 Oracle JDeveloper, 2-7
 Sun JDK and JRE, 2-8

D

databases
 troubleshooting, 2-9
development environment
 configuring, 2-7
DOM
 licensing, 1-5

E

encryption, password, 2-9

G

glossary terms, 1-1

H

hardware requirements, 1-2

I

installation
 non-Windows environment, 2-5
 prerequisites, 2-2
 requirements, 1-2
 silent, 2-4, 2-6
 types, 2-2
 UNIX environment, 2-5
 Windows environment, 2-3
installation types, 2-2

J

Java
 Cryptography Extension, 2-9
 Java 2, 2-8
Java Runtime Environment v 1.4.1
 licensing, 1-7
JCE (Java Cryptography Extension), 2-9
JDeveloper, configuring with OracleAS
 TopLink, 2-7
JDK (Sun), 2-8

N

non-Windows environment
 installing OracleAS TopLink, 2-5
 silent installation, 2-6
non-windows environment
 see also UNIX

O

Oracle Metalink, 2-10
Oracle Support Services, 2-10
OracleAS TopLink
 installing, 2-3
OracleAS TopLink Examples, 2-7
 requirements, 1-2

P

password encryption, 2-9
patch sets, 2-10

R

requirements, system, 1-2

S

silent installation
 non-Windows environment, 2-6
 UNIX environment, 2-6
 Windows environment, 2-4
software requirements, 1-2

U

UNIX environment
 installing OracleAS TopLink, 2-5
 silent installation, 2-6

W

Windows environment
 installing OracleAS TopLink, 2-3
 silent installation, 2-4