

## **Oracle® Application Server TopLink**

Getting Started Guide

10g (9.0.4.5) for hp HP-UX Itanium, and Linux Itanium

**Part No. B15872-01**

February 2005

Oracle Application Server TopLink Getting Started Guide, 10g (9.0.4.5) for hp HP-UX Itanium, and Linux Itanium

Part No. B15872-01

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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](#)
- [Documentation Accessibility](#)
- [Structure](#)
- [Related Documentation](#)
- [Conventions](#)

## 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 UNIX. 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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## **Structure**

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.

### **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*

Printed documentation is available for sale in the Oracle Store at

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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://www.oracle.com/technology/membership/>

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.	<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, 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. <b>Note:</b> 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 <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"> <li>■ That we have omitted parts of the code that are not directly related to the example</li> <li>■ That you can repeat a portion of the code</li> </ul>	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;
<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.  <b>Note:</b> 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;

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# 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:

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

## 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:

- HP-UX 11i Version 2 (11.23) Itanium or higher
- Red Hat Enterprise Linux AS/ES 3.0
- SUSE Linux Enterprise Server 9

### 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
- 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 or later versions. It is certified with Sun JDK 1.4.2\_05 version on Intel Itanium 2 computers.

### 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 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 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 2.7.1](#)
- [DOM](#)
- [JRE version 1.4.2](#)

#### 1.3.1.1 Apache Ant version 1.5.1

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The license information about Apache Ant is available at

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

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```

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 *
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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.

```

\*/

### 1.3.1.2 Antlr version 2.7.1

OracleAS TopLink uses Another Tool for Language Recognition (Antlr) version 2.7.1 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 2.7.1 is available at

<http://wwwantlr.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

The Java Runtime Environment (JRE) is maintained by Sun Microsystems, Inc. The OracleAS TopLink needs to be certified with Sun JDK 1.4.2\_05 version on Itanium 2 machines. The OracleAS TopLink Mapping Workbench runs in Microsoft Windows JDK 1.4.2 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.

The license information about JRE 1.4.2 is available at

[http://java.sun.com/j2se/1.4.2/j2se-1\\_4\\_2-thirdpartylicensereadme.txt](http://java.sun.com/j2se/1.4.2/j2se-1_4_2-thirdpartylicensereadme.txt)

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## 1.4 Certification Information

The latest certification information for 10g (9.0.4.5) is available at  
<http://metalink.oracle.com>



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# Installing and Configuring OracleAS TopLink

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

- [OracleAS TopLink Installation Types](#)
- [Installing OracleAS TopLink](#)
- [Configuring the OracleAS TopLink Examples](#)
- [JDK and JRE](#)
- [General Troubleshooting](#)

## 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:

- [Setting the Mount Point](#)
- [Starting the Installer](#)
- [Installing OracleAS TopLink](#)
- [Performing Silent Installation](#)

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

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### 2.2.1 Setting the Mount Point

The Oracle Application Server CD-ROMs are in RockRidge format. To manually mount or unmount the disk, you must have root privileges. Be sure to unmount the disk before removing it from the drive.

To mount the first disk, log in as the root user and follow the steps in one of the following sections, depending on your platform:

- ["Mounting the First Disk on HP-UX"](#) on page 2-2
- ["Mounting the First Disk on Linux"](#) on page 2-2

#### Mounting the First Disk on HP-UX

To mount the first disk, follow these steps:

1. Insert Oracle Application Server disk 1 into the disk drive.
2. Create the /SD\_CDROM directory if it does not already exist:  

```
# /usr/bin/mkdir /SD_CDROM
```
3. To mount the disk, enter a command similar to the following:

```
# /usr/sbin/mount -F cdfs -o rr /dev/dsk/cxdydz /SD_CDROM
```

In the preceding example, /SD\_CDROM is the disk mount point directory and /dev/dsk/cxdydz is the device name for the disk device, for example /dev/dsk/c0d2t0.

#### Mounting the First Disk on Linux

On most Linux systems, the disk mounts automatically when you insert it into the disk drive. To mount the first disk, follow these steps:

1. Insert Oracle Application Server disk 1 into the disk drive.
2. To verify that the disk mounted automatically, enter the following command:

- Red Hat:

```
# ls /mnt/cdrom
```

- SUSE Linux Enterprise Server:

```
# ls /media/cdrom
```

3. If the command in step 2 fails to display the contents of the disk, enter the following command:

- Red Hat:

```
# mount -t iso9660 /dev/cdrom /mnt/cdrom
```

- SUSE Linux Enterprise Server:

```
# mount -t iso9660 /dev/cdrom /media/cdrom
```

## 2.2.2 Starting the Installer

1. If the computer does not mount CD-ROMs automatically, you need to set the mount point manually. See [Section 2.2.1, "Setting the Mount Point"](#) for details.
2. Log in as the `oracle` user.
3. Insert Oracle Application Server Disk 1 into the CD-ROM drive.
4. Run the Oracle Universal Installer using the command shown after the notes:

---



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**Notes:**

- 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 Oracle Application Server.
  - Do not start the installation inside the `mount_point` directory. If you do, then you may not be able to eject the installation disk. The `cd` command changes your current directory to your home directory.
  - The Oracle Universal Installer cannot display Korean or Chinese fonts on Linux systems because the JDK does not support these fonts.
- 
- 

- For HP-UX and Linux:

CD-ROM users:

```
prompt> cd
prompt> mount_point/runInstaller
```

This launches Oracle Universal Installer, through which you can install Oracle Application Server.

## 2.2.3 Installing OracleAS TopLink

To start the OUI and install OracleAS TopLink:

1. Mount the disk as described in [Section 2.2.1, "Setting the Mount Point"](#)

---



---

**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.

---

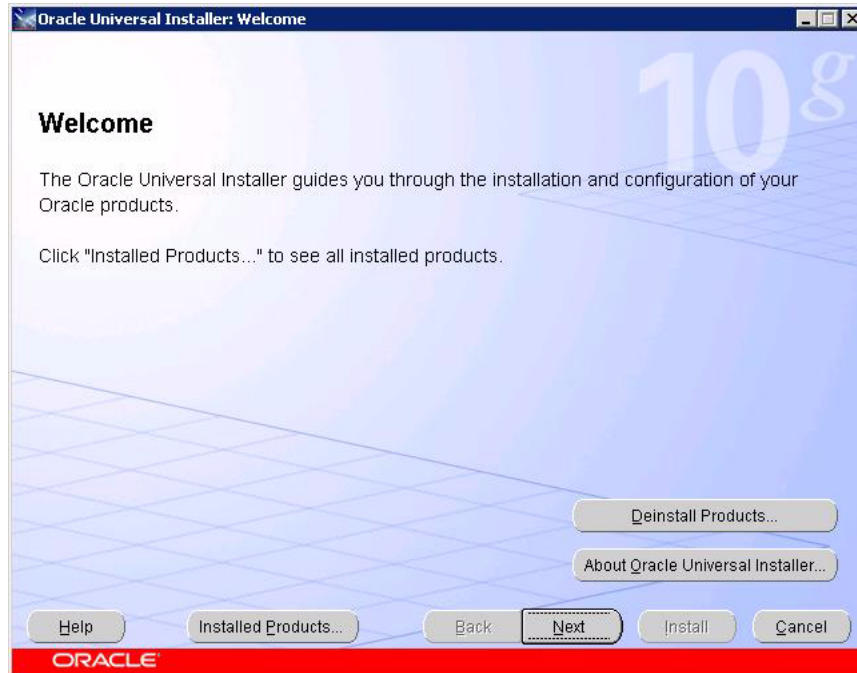


---

2. Start the installer as described in [Section 2.2.2, "Starting the Installer"](#).

The Oracle Universal Installer Welcome screen is displayed as shown in [Figure 2-1](#). It provides information about the OUI.

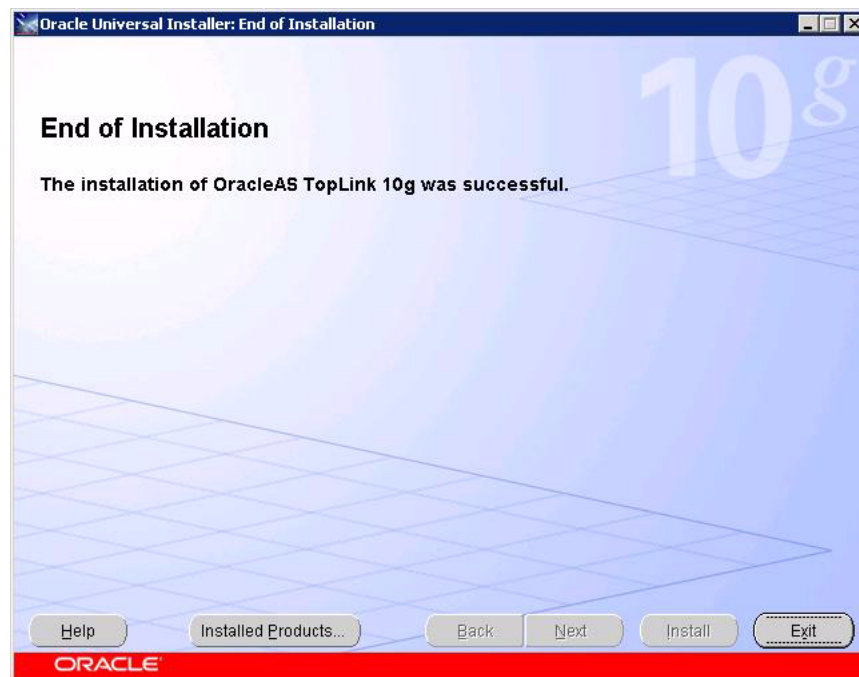
**Figure 2-1 Oracle Universal Installer Welcome Screen**



3. Click **Next**. The Specify File Locations screen is displayed.
4. Enter the following information in the fields provided:
  - a. Source Path: The default value is displayed. 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 is displayed as shown in [Figure 2-2](#).

**Figure 2–2 Select Installation Type Screen**

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 is displayed.
8. After reviewing the Summary screen, click **Install**. This completes the installation and displaying the End of Installation screen as shown in [Figure 2–3](#).

**Figure 2–3 End of Installation Screen**

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.sh` file. The `JDBC_CLASSPATH` variable must specify the path to the preferred JDBC drivers.

---

**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*

## 2.2.4 Performing Silent Installation

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 disc 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. Enter the following command:

```
prompt> runInstaller -silent -responseFile absolute_path_and_filename
```
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.

## 2.3 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.

## 2.4 JDK and JRE

On HP-UX Itanium and Linux Itanium platforms, OracleAS TopLink includes the Java Runtime Environment (JRE) 1.4.2. OracleAS TopLink is certified with JRE 1.4.2.05 for HP-UX Itanium systems, and with JRE 1.4.2.04 for Linux Itanium systems, for use by the OracleAS TopLink Mapping Workbench. .

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

At run time, the OracleAS TopLink Foundation Library requires a JVM compatible with JDK 1.4.2 or later.

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 1.4.2 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.

## 2.5 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.
- 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.



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# 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 class path**

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 multitier 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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