

**Oracle® TopLink**  
Getting Started Guide  
10g (10.1.3.1.0)  
**B28217-02**

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Oracle TopLink Getting Started Guide, 10g (10.1.3.1.0)

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# Preface

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

This preface contains these topics:

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

## Intended Audience

The *Oracle TopLink Getting Started Guide* is intended for new users who need to install and configure 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.

## Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at

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## **Organization**

This document includes the following chapters:

### **Chapter 1, "Prerequisites for Installing Oracle TopLink"**

This chapter contains important prerequisites information.

### **Chapter 2, "Installing and Configuring TopLink"**

This chapter contains instructions for installing and configuring TopLink.

### **Chapter 3, "Migrating to TopLink 10g (10.1.3.1.0)"**

This chapter contains instructions on how to migrate existing TopLink projects to Oracle TopLink 10g (10.1.3.1.0).

## **Related Documentation**

For more information, see these Oracle resources:

- *Oracle TopLink Release Notes*
- *Oracle TopLink API Reference*
- *Oracle TopLink Developer'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://www.oracle.com/technology/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://www.oracle.com/technology/docs>

### **Feedback**

If you have questions about TopLink, you can consult the TopLink user's forum at:

<http://forums.oracle.com/forums/forum.jspa?forumID=48>

If you have questions or feedback about this documentation, you can consult the documentation feedback forum at

<http://forums.oracle.com/forums/forum.jspa?forumID=165>

## Conventions

The following text conventions are used in this document:

<b>Convention</b>	<b>Meaning</b>
<b>boldface</b>	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.



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# Prerequisites for Installing Oracle TopLink

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

- [System Requirements and Certifications](#)
- [Supported Databases](#)
- [Third-Party License Information](#)

## System Requirements and Certifications

The complete product requirements list and the latest certification information for 10g (10.1.3.1.0) is available at:

[http://www.oracle.com/technology/software/products/ias/files/as\\_certification\\_r3\\_101310.html](http://www.oracle.com/technology/software/products/ias/files/as_certification_r3_101310.html).

In addition to these requirements, consider the following:

### Java Virtual Machine (JVM) and Java Development Kit (JDK)

TopLink requires a JVM compatible with JDK 1.4.2 (or higher). TopLink also requires internet access to use URL-based schemas and hosted documentation.

### Java Database Connectivity (JDBC) Driver

TopLink requires JDBC 2.0 or higher drivers. TopLink can interoperate with JDBC 3.0 drivers but does not support all features specific to JDBC 3.0. Contact your database and JDBC driver vendor to determine which object-relational extensions they support.

For TopLink Workbench to retrieve table information from the database, the JDBC driver must support the following JDBC methods:

- `getTables`
- `getTablesTypes`
- `getImportedKeys`
- `getCatalogs`
- `getPrimaryKeys`

### Java Cryptography Extension (JCE)

TopLink uses JCE to encrypt database login information. JCE is included with JDK 1.4 (or higher).

## Supported Databases

TopLink supports the following Oracle Database platforms (for more information, see the `oracle.toplink.platform.database.oracle` package in the *Oracle TopLink API Reference*):

- `OraclePlatform`
- `Oracle8Platform`
- `Oracle9Platform`
- `Oracle10Platform`

TopLink supports the following non-Oracle Database platforms (for more information, see the `oracle.toplink.platform.database` package in the *Oracle TopLink API Reference*):

- `AccessPlatform` for Microsoft Access databases
- `AttunityPlatform` for Attunity Connect JDBC drivers
- `CloudscapePlatform`
- `DB2MainframePlatform`
- `DB2Platform`
- `DBasePlatform`
- `HSQLPlatform`
- `InformixPlatform`
- `MySQL4Platform`
- `PointBasePlatform`
- `SQLAnywherePlatform`
- `SQLServerPlatform`
- `SybasePlatform`
- `TimesTenPlatform`

For more information on JDBC driver requirements, see "[Java Database Connectivity \(JDBC\) Driver](#)" on page 1-1.

## Third-Party License Information

TopLink uses and includes the following software:

- [Antlr](#)
- [DOM](#)
- [Java Runtime Environment](#)
- [ASM](#)

### Antlr

<http://wwwantlr.org/rights.html>

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. 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

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

The Java Runtime Environment is maintained by Sun Microsystems, Inc. The Oracle TopLink installation includes JRE 1.5 by default. You may configure TopLink to run using any other compliant Java 2 VM. Java and all Java-based trademarks and logos are trademarks or registered trademarks of Sun Microsystems, Inc., in the U.S. and other countries.

## ASM

ASM is a Java bytecode manipulation framework. It can be used to dynamically generate stub classes or other proxy classes, directly in binary form, or to dynamically modify classes at load time, that is, just before they are loaded into the Java Virtual Machine.

<http://asm.objectweb.org/license.html>

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## Installing and Configuring TopLink

This chapter includes the following information to install and configure Oracle TopLink on your computer:

- [Installing TopLink](#)
- [Configuring TopLink Runtime Environment](#)
- [Configuring TopLink Workbench Environment](#)
- [TopLink JPA](#)
- [Starting TopLink Workbench](#)
- [Installation Troubleshooting](#)
- [Installing Patch Sets](#)

### Installing TopLink

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

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**Warning:** If you are upgrading from a pre-Release 1 (9.0.3), you must convert the package names before you open your TopLink project(s) in 10g (10.1.3.1.0). Refer to "[Package Rename](#)" on page 3-7 for more information after installing TopLink.

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This section includes information on:

- [Using Oracle Universal Installer](#)
- [Installing Silently](#)
- [TopLink JAR Files](#)

### Using Oracle Universal Installer

Use this procedure to start the Oracle Universal Installer and install TopLink 10g (10.1.3.1.0).

1. For **Windows** operating systems:
  - Ensure that you are logged in to the computer as a member of the Windows Administrators group.

- When configuring TopLink for use with J2EE containers, you must modify the **System Variables**—not the **User Variables**.

For **Unix or other non-Windows** operating systems:

- Ensure that 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 TopLink.
  - Log in as the `oracle` user.
2. Insert the TopLink installation disk into the CD-ROM drive to launch Oracle Universal Installer, or download the installer from:

<http://www.oracle.com/technology/products/ias/toplink/index.html>

For **Windows** operating systems:

- 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, execute the `G:\setup.exe` program (where G is the letter for your CD-ROM drive) to start the installer.

For **UNIX or other non-Windows** operating systems:

- 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, enter:  
`prompt> mount_point/as_10131disk/runInstaller` to launch the installer.

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

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3. Complete each screen of the installer.
4. When the installation is complete, you must configure the TopLink Workbench environment.  
  
For more information, see "Configuring the TopLink Workbench Environment" in the *Oracle TopLink Developer's Guide*.
5. Refer to `<ORACLE_HOME>\toplink\doc\index.html.html` for the latest Oracle TopLink Release Notes.

By default, the TopLink installation allows access for *only the user who performed the installation*. If your TopLink installation is in a shared environment you must manually change the file permissions for all files in the `<ORACLE_HOME>` directory. Executable files require **read and execute** access; non-executable files require **read** access. Refer to your operating system documentation for information on setting file permissions.

## Installing Silently

Silent installation mode is available for all installation types. You can use 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 TopLink installation disk into the CD-ROM drive.
2. Open the `\Stage\Response` directory and select the `oracle.toplink.install_type_1.rsp` file.
3. Copy the `oracle.toplink.install_type_1.rsp` file to a temporary (`tmp`) location.
4. Edit the following parameters in the `oracle.toplink.install_type_1.rsp` file:

**ORACLE\_HOME**  
**ORACLE\_HOME\_NAME**  
**GROUP\_NAME** (for Unix or other non-Windows operation systems only)  
**FROM\_LOCATION**

5. Start the installer.

For **Windows** operating systems, open a command prompt window and enter:

```
setup.exe -responseFile c:/oracle.toplink.install_type_1.rsp -silent
```

For **UNIX and other non-Windows** operating systems, open a command prompt window and enter:

```
./runInstaller -responseFile /tmp/oracle.toplink.install_type_1.rsp -silent
```

If your installation was successful, the `silentInstall.log` file contains the line:

*"The installation of TopLink was successful."*

## TopLink JAR Files

The following table describes the TopLink JAR files installed in the `<ORACLE_HOME>/toplink/jlib` directory.

**Table 2–1 TopLink JAR Files**

JAR File	Contents
<code>antlr.jar</code>	This JAR contains the Antlr (ANother Tool for Language Recognition) tool.
<code>cmpmigrator.jar</code>	This JAR contains the TopLink migration tool for migrating an existing J2EE application to use TopLink as the persistence manager. See "Persistence Manager Migration" in the <i>Oracle TopLink Developer's Guide</i> for more information.
<code>packageRename.jar</code>	This JAR contains the TopLink Package Rename tool for migrating Release 1 (9.0.3) projects to 10g (10.1.3.1.0). See " <a href="#">Package Rename</a> " on page 3-7 for more information.
<code>preview-persistence.jar</code>	This JAR contains the preview version of the TopLink JPA functionality for EJB 3.0.  Initially available with Release 3 (10.1.3.0.0), this JAR has been superseded by the JPA 1.0 implementation provided by TopLink Essentials ( <a href="#">toplink-essentials.jar</a> ) and is included for backwards-compatibility only. Do not use both JARs ( <code>preview-persistence</code> and <code>toplink-essentials</code> ) together. See "EJB 3.0 JPA Persistence JAR Files" in the <i>Oracle Containers for J2EE Enterprise JavaBeans Developer's Guide</i> for information on specifying which JPA persistence implementation to use.
<code>tljaxb.jar</code>	This JAR contains the TopLink JAXB compiler necessary to create a JAXB project. For more information, see "Creating an XML Project From an XML Schema" in the <i>Oracle TopLink Developer's Guide</i> .

**Table 2–1 (Cont.) TopLink JAR Files**

JAR File	Contents
<code>tlmwcore.jar</code>	This JAR contains the TopLink Workbench classes used by the TopLink Workbench application classes in <code>toplinkmw.jar</code> .  Use this library when generating TopLink Workbench projects (MWP) or creating deployment XML from TopLink Workbench or from within code. This library is also used by the migration utilities and ANT tasks that automate these development tasks.
<code>tlmwhelp.jar</code>	This JAR contains the TopLink Workbench online help used by the TopLink Workbench application classes in <code>toplinkmw.jar</code> . It is not needed in customer applications or utilities.
<code>toplink-agent.jar</code>	This JAR contains the classes that TopLink uses to perform byte-code weaving on EJB 2.1 entity bean classes to enable transparent 1:1 and M:1 indirection without requiring the use of a ValueHolder. You invoke <code>toplink-agent.jar</code> by adding <code>-javaagent:toplink-agent.jar</code> to your application's JVM command line – do not include this jar on the classpath of a TopLink application.  For more information, see "Indirection, Serialization, and Detachment" in the <i>Oracle TopLink Developer's Guide</i> .
<code>toplink-deprecated.jar</code>	This JAR contains all classes that have been deprecated. Oracle recommends that you avoid using all deprecated classes because support for them may be removed in a future release. Include this JAR on your application classpath only if necessary. See the API Modifications for more information.
<code>toplink-essentials.jar</code>	This JAR contains TopLink Essentials, the open source JPA edition of TopLink. See "TopLink JPA" on page 2-5 for more information, including how to obtain the source ( <code>toplink-essentials-src.zip</code> ).
<code>toplink-essentials-agent.jar</code>	This JAR contains the classes that TopLink uses to perform byte-code weaving on JPA entities to automatically enable features such as ValueHolder indirection. You invoke <code>toplink-essentials-agent.jar</code> by adding <code>-javaagent:toplink-essentials-agent.jar</code> to your application or client JVM command line or by using the <code>toplink.weaving</code> TopLink JPA extension that you can define in a <code>persistence.xml</code> file.  This JAR is optional and should never be placed on the classpath – only as part of <code>-javaagent</code> .
<code>toplink-oc4j.jar</code>	This JAR contains the classes that TopLink uses to integrate with Oracle Containers for J2EE.  This JAR is only used in OC4J; the container is preconfigured to use <code>toplink-oc4j.jar</code> . In a non-OC4J application, use <code>toplink.jar</code> .
<code>toplink.jar</code>	This JAR contains all the classes that comprise the TopLink API.
<code>toplinkmw.jar</code>	This JAR contains the TopLink Workbench application classes. It depends on <code>tlmwcore.jar</code> and <code>tlmwhelp.jar</code> .

For information on packaging and deploying TopLink with an application server, refer to "Deploying a TopLink Application" in the *Oracle TopLink Developer's Guide*.

## Configuring TopLink Runtime Environment

At runtime, the TopLink Foundation Library requires the Java Runtime Environment 1.3 (or higher). By default, the TopLink installation includes the JRE 1.5.

To configure TopLink for a different version of the JRE, change the `<ORACLE_HOME>/toplink/bin/setenv` file to point `JAVA_HOME` to the alternate directory.

## Configuring TopLink Workbench Environment

After installing TopLink Workbench, you must configure the following:

- [JRE Version](#)
- [Online Help and Documentation](#)

### JRE Version

TopLink Workbench requires the Java Runtime Environment 1.4.2\_06 (or higher). By default, the TopLink installation includes the JRE 1.5.

To configure TopLink for a different version of the JRE, change the `<ORACLE_HOME>/toplink/bin/setenv` file to point `JAVA_HOME` to the alternate directory.

### Online Help and Documentation

By default, TopLink installs only a portion of TopLink Workbench online help system on your PC. To access the complete documentation from Oracle, ensure that your PC is connected to the internet and the your proxy information (if necessary) is correct.

For more information on how to specify the help mode, refer to "Help Preferences" in the *Oracle TopLink Developer's Guide*.

From the TopLink Workbench menu, select **Tools > Preferences**. On the Preferences dialog, select **General** to configure your proxy information.

### Driver Classpath Environment Variable

Depending on the TopLink Workbench project, you are required to update the `DRIVER_CLASSPATH` environment variable to add the location of the following (if necessary):

- JDBC drivers – If you are using relational projects.
- J2EE Connector Architecture (J2C/JCA) adapters – If you are using TopLink Workbench Enterprise Information System (EIS) projects.
- Oracle Database `<ORACLE_HOME>/rdbms/jlib/xdb.jar` file – If you are using direct to XML type mappings with an Oracle9i or higher database.
- Custom `Collection` class that you use to override the default `Collection` class that TopLink uses with a mapping container policy.

For more information on how to update the `DRIVER_CLASSPATH` environment variable, see "Configuring the TopLink Workbench Environment" in the *Oracle TopLink Developer's Guide*.

### Third-party Libraries

If you plan to use additional, third-party libraries (such as XMLType Mappings or EIS with Attunity), when deploying your Oracle TopLink project, you must copy the appropriate JAR file to `<ORACLE_HOME>/toplink/jlib`. Additionally, you must include the libraries on you server's classpath.

### TopLink JPA

The Java Persistence API (JPA), part of the Java Enterprise Edition 5 (Java EE 5) Enterprise Java Beans (EJB) 3.0 specification, greatly simplifies Java persistence and

provides an object-relational mapping approach that allows you to declaratively define how to map Java objects to relational database tables in a standard, portable way that works both inside a Java EE 5 application server and outside an EJB container in a Java Standard Edition (Java SE) 5 application.

TopLink Essentials is the JPA provider for the EJB 3.0 Reference Implementation. In addition to being JPA compliant, it also provides additional extensions beyond what is defined in the JPA specification.

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**Note:** TopLink Essentials is the default JPA persistence provider for EJB 3.0 JPA applications when used with Oracle Containers for J2EE.

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When using TopLink JPA you can leverage additional functionality beyond the JPA 1.0 specification. These extensions are provided through the use of query hints, persistence unit properties, and additional API. For more information on TopLink JPA extensions, see <http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-extensions.html>.

To obtain more information and to download the source (`toplink-essentials-src.zip`), see the following:

- <http://www.oracle.com/technology/products/ias/toplink/jpa/index.html>
- "Understanding the EJB 3.0 JPA Entity Architecture" in the *Oracle TopLink Developer's Guide*

## Starting TopLink Workbench

To start TopLink Workbench, simply execute the `workbench.cmd` or `.sh` file in the `<INSTALL_DIR>/toplink/bin` directory. The TopLink Welcome Screen appears.

If you receive a "Cannot Find Main Class" error, ensure that you have configured `JAVA_HOME` correctly. See "[JRE Version](#)" on page 2-5.

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**Note:** On Microsoft Windows XP platforms with mapped network drives, the TopLink Workbench File Chooser dialogs (such as Save File or Open File) may experience slow responses for opening and traversing directory trees. Unmapping the network drives eliminates this behavior.

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To use TopLink Workbench in a language different than your default, add the `-Duser.language` and `-Duser.country` options to the `JVM_ARGS` variable in the `workbench.cmd` or `.sh` file. For example, the following arguments will start TopLink Workbench in US English; regardless of default language of your operating system.

```
JVM_ARGS="-Duser.language=en -Duser.country=en_US"
```

## Installation Troubleshooting

After you install 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.
  - If it takes an extremely long time to start TopLink Workbench after the splash screen appears (for example, more than 30 seconds), ensure that your proxy help mode and proxy information is correct. See "[Online Help and Documentation](#)" on page 2-5 for details.
  - On Unix, TopLink Workbench requires a "home" directory to store your user preferences. Use one of the following methods to specify a home directory:
    - Create a new `/home/<USERNAME>` directory to store your user preferences.
    - Add the `-D` option to the `JVM_ARGS` variable in the `workbench.sh` file to specify an existing directory to use as your home directory. For example:

```
JVM_ARGS=" -Duser.home=/someDirectory"
```

where *someDirectory* is an existing directory to use as your home directory.
- If you do not create or specify a home directory, TopLink Workbench will fail to start.

## Installing Patch Sets

When available, you can download the latest patch sets for 10g (10.1.3.1.0) 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.



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## Migrating to TopLink 10g (10.1.3.1.0)

This chapter describes how to migrate existing Oracle TopLink projects to TopLink 10g (10.1.3.1.0).

This chapter includes the following sections:

- [Migrating From 10.1.3.0 TopLink JPA Preview Persistence](#)
- [Upgrading TopLink Workbench Projects](#)
- [Package Rename](#)
- [Updating Sessions XML Files](#)
- [Using Hosted XSD](#)

Refer to "Integrating TopLink With an Application Server" in the *Oracle TopLink Developer's Guide* for information on migrating existing OC4J or WebLogic persistence to TopLink.

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**Note:** If you receive `ClassNotFoundException` 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 TopLink Workbench project. For more information, see "Configuring Project Classpath" in the *Oracle TopLink Developer's Guide*.

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

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### Migrating From 10.1.3.0 TopLink JPA Preview Persistence

In 10.1.3.0, TopLink provides a JPA preview based on a subset of the functionality specified in the EJB 3.0 public review draft.

In 10.1.3.1, TopLink provides full JPA support (through TopLink Essentials) as per the final EJB 3.0 specification.

See "EJB 3.0 JPA Persistence JAR Files" in the *Oracle Containers for J2EE Enterprise JavaBeans Developer's Guide* for information on specifying which JPA persistence implementation to use.

You must make code changes to your JPA preview-based application before using it with TopLink 10.1.3.1. This section describes the important differences between the TopLink JPA preview and full TopLink JPA to help you identify where changes must be made, including:

- [Changes in javax.persistence](#)

- [Changes in oracle.toplink.essentials.platform.database](#)
- [Acquiring an Entity Manager: Persistence Units and the persistence.xml File](#)
- [New JAR Files](#)

## Changes in javax.persistence

Table 3–1 lists the additions, deletions, and changes made to the `javax.persistence` package between 10.1.3.0 and 10.1.3.1. If your application uses any of these classes, consult the latest EJB 3.0 specification and JPA Javadoc for details.

**Table 3–1** Changes to `javax.persistence`

10.1.3.0	10.1.3.1	Description
<code>AccessMode</code>	deleted	In 10.1.3.1, EJB 3.0 entities do not require local or remote interfaces. Because all entity access is by way of an <code>EntityManager</code> , clients need not be concerned about whether access is local or remote.
<code>AccessType</code>	deleted	In 10.1.3.1, the EJB 3.0 persistence specification requires the use of a single access type in an entity hierarchy. The placement of the mapping annotations determines the access type in effect.
not applicable	<code>AssociationOverride</code>	Added in 10.1.3.1 as part of the changes made to annotations for inheritance. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#AssociationOverride">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#AssociationOverride</a> .
not applicable	<code>AssociationOverrides</code>	Added in 10.1.3.1 as part of the changes made to annotations for inheritance. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#AssociationOverrides">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#AssociationOverrides</a> .
<code>Basic</code>	<code>Basic</code>	In 10.1.3.1, attribute <code>temporalType</code> is omitted. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Basic">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Basic</a> .
not applicable	<code>DiscriminatorValue</code>	Added in 10.1.3.1 as part of the changes made to annotations for inheritance. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#InheritanceAnnotations">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#InheritanceAnnotations</a>
<code>EmbeddableSuperclass</code>	deleted	Added in 10.1.3.1 as part of the changes made to annotations for inheritance. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#InheritanceAnnotations">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#InheritanceAnnotations</a>
<code>Entity</code>	<code>Entity</code>	In 10.1.3.1, attribute <code>access</code> is omitted.
not applicable	<code>EntityExistsException</code>	Added in 10.1.3.1.

**Table 3–1 (Cont.) Changes to `javax.persistence`**

10.1.3.0	10.1.3.1	Description
EntityListener	deleted	In 10.1.3.1, use EntityListeners instead. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#EntityListeners">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#EntityListeners</a> .
not applicable	EntityListeners	Added in 10.1.3.1. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#EntityListeners">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#EntityListeners</a> .
EntityManager	EntityManager	In 10.1.3.1, EntityManager method <code>getUserTransaction</code> is named <code>getTransaction</code> . New methods added in 10.1.3.1 include: <ul style="list-style-type: none"> <li>▪ <code>setFlushMode</code></li> <li>▪ <code>getFlushMode</code></li> <li>▪ <code>lock</code></li> <li>▪ <code>clear</code></li> <li>▪ <code>joinTransaction</code></li> <li>▪ <code>getDelegate</code></li> </ul> In 10.1.3.1, methods of this class throw additional exceptions such as <code>EntityExistsException</code> and <code>IllegalStateException</code> and in some cases, methods throw <code>IllegalStateException</code> instead of <code>IllegalArgumentException</code> .
EntityNotFoundException	EntityNotFoundException	In 10.1.3.1, this exception extends <code>PersistenceException</code> instead of <code>RuntimeException</code> .
EntityTransaction	EntityTransaction	New methods added in 10.1.3.1, include: <ul style="list-style-type: none"> <li>▪ <code>setRollbackOnly</code></li> <li>▪ <code>getRollbackOnly</code></li> </ul>
EntityType	deleted	In 10.1.3.1, the EJB 3.0 specification removes the concept of BMP. To develop and deploy a Java EE 5 BMP application, you must use the EJB 2.1 API.
not applicable	Enumerated	Added in 10.1.3.1 to support direct mappings of enumerated types. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Enumerated">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Enumerated</a> .
not applicable	EnumType	Added in 10.1.3.1 to support direct mappings of enumerated types. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Enumerated">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Enumerated</a> .

**Table 3–1 (Cont.) Changes to javax.persistence**

10.1.3.0	10.1.3.1	Description
not applicable	ExcludeDefaultListeners	Added in 10.1.3.1 to support managing lifecycle callback default listeners. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#ExcludeDefaultListeners">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#ExcludeDefaultListeners</a> .
not applicable	ExcludeSuperclassListeners	Added in 10.1.3.1 to support managing lifecycle callback superclass listeners. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#ExcludeSuperclassListeners">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#ExcludeSuperclassListeners</a> .
FlushMode	deleted	In 10.1.3.1, to set the flush mode, use the EntityManager method setFlushMode to set the FlushModeType.
not applicable	GeneratedValue	Added in 10.1.3.1 to support automatic primary key (identity) generation. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#GeneratedValue">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#GeneratedValue</a> .
not applicable	GenerationType	Added in 10.1.3.1 to support automatic primary key (identity) generation. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#GenerationType">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#GenerationType</a> .
GeneratorType	deleted	In 10.1.3.1, use GeneratedValue attribute strategy to set the GenerationType.
Inheritance	Inheritance	In 10.1.3.1, the following attributes are omitted: <ul style="list-style-type: none"> <li>▪ discriminatorType</li> <li>▪ discriminatorValue</li> </ul> For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#InheritanceAnnotations">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#InheritanceAnnotations</a> .
JoinColumn	JoinColumn	In 10.1.3.1, attribute secondaryTable is changed to table. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#JoinColumn">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#JoinColumn</a> .
JoinTable	JoinTable	In 10.1.3.1, attribute table (type Table) is changed to name (type String). The following attributes are added: <ul style="list-style-type: none"> <li>▪ catalog</li> <li>▪ schema</li> <li>▪ uniqueConstraints</li> </ul> For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#JoinTable">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#JoinTable</a> .

**Table 3–1 (Cont.) Changes to `javax.persistence`**

10.1.3.0	10.1.3.1	Description
LobType	deleted	In 10.1.3.1, use direct mapping annotation <code>Lob</code> to specify a Lob type. A Lob may be either a binary or character type. The persistence provider infers the Lob type from the type of the persistent field or property.  For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Lob">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Lob</a> .
not applicable	LockModeType	
not applicable	MappedSuperclass	Added in 10.1.3.1 as part of the changes made to annotations for inheritance.  For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#MappedSuperclass">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#MappedSuperclass</a> .
NamedNativeQuery	NamedNativeQuery	In 10.1.3.1, attribute <code>queryString</code> changed to <code>query</code> and attribute <code>hints</code> was added.  For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#NamedNativeQuery">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#NamedNativeQuery</a> .
NamedQuery	NamedQuery	In 10.1.3.1, attribute <code>queryString</code> changed to <code>query</code> and attribute <code>hints</code> was added.  For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#NamedQuery">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#NamedQuery</a> .
NoResultException	NoResultException	In 10.1.3.1, this exception extends <code>PersistenceException</code> instead of <code>RuntimeException</code> .
not applicable	OptimisticLockException	
PersistenceContext	PersistenceContext	In 10.1.3.1, attribute <code>properties</code> was added.  For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#PersistenceContext">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#PersistenceContext</a> .
not applicable	PersistenceProperty	For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#PersistenceProperty">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#PersistenceProperty</a> .
not applicable	QueryHint	For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#QueryHint">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#QueryHint</a> .
not applicable	RollbackException	
SecondaryTable	SecondaryTable	In 10.1.3.1, attribute <code>pkJoin</code> was changed to <code>pkJoinColumns</code> .  For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#SecondaryTable">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#SecondaryTable</a> .

**Table 3–1 (Cont.) Changes to javax.persistence**

10.1.3.0	10.1.3.1	Description
SequenceGenerator	SequenceGenerator	In 10.1.3.1, the default for attribute <code>initialValue</code> changed from 0 to 1. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#SequenceGenerator">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#SequenceGenerator</a> .
not applicable	SqlResultSetMappings	For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#SqlResultSetMappings">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#SqlResultSetMappings</a> .
Table	Table	In 10.1.3.1, attribute <code>specified</code> is omitted. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Table">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Table</a> .
TableGenerator	TableGenerator	in 10.1.3.1, the following attributes were added: <ul style="list-style-type: none"> <li>▪ <code>catalog</code></li> <li>▪ <code>schema</code></li> <li>▪ <code>uniqueConstraints</code></li> </ul> For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#TableGenerator">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#TableGenerator</a> .
not applicable	Temporal	For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Temporal">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Temporal</a> .
TemporalType	TemporalType	In 10.1.3.1, enum value <code>NONE</code> is omitted. For more information, see <a href="http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Temporal">http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#Temporal</a> .
TransactionRequiredException	TransactionRequiredException	In 10.1.3.1, this exception extends <code>PersistenceException</code> instead of <code>RuntimeException</code> .

## Changes in oracle.toplink.essentials.platform.database

In 10.1.3.1, the following new classes were added:

- `DerbyPlatform`
- `JavaDBPlatform`
- `PostgreSQLPlatform`

## Acquiring an Entity Manager: Persistence Units and the persistence.xml File

In 10.1.3.0, you use the `java.persistence.setup.config` property to identify a class with the list of entities that an entity manager manages.

In 10.1.3.1, this property is obsolete. Instead, you must define managed entity classes in a persistence unit as per the EJB 3.0 specification. For more information, see:

- <http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-annotations.html#EntityManagerAnnotations>).
- <http://www.oracle.com/technology/products/ias/toplink/jpa/resources/toplink-jpa-extensions.html#persistence-xml>).

## New JAR Files

In 10.1.3.0, the `persistence-preview.jar` provides the TopLink JPA preview implementation.

In 10.1.3.1, the `toplink-essentials.jar` and `toplink-essentials-agent.jar` provides the full TopLink JPA implementation.

In your IDE, ensure that any library definitions you may have associated with your projects include only the 10.1.3.1 TopLink JPA libraries and exclude the old 10.1.3.0 libraries.

For more information about TopLink JAR files, see "[TopLink JAR Files](#)" on page 2-3.

## Upgrading TopLink Workbench Projects

Use [Table 3–2](#) to upgrade both your TopLink Workbench project ( `.mwp`) and, if necessary, your `project.xml` file from a previous version of TopLink.

**Table 3–2 Upgrading TopLink Workbench Projects**

To Upgrade From...	Use This Procedure...
Release 3 (10.1.3) and Release 2 (10.1.2)	<ol style="list-style-type: none"> <li>1. Open the existing project with the 10g (10.1.3.1.0) TopLink Workbench.</li> <li>2. Save the new TopLink Workbench project to a new location.</li> </ol>
Release 2 (9.0.4)	<ol style="list-style-type: none"> <li>1. Open the existing project with the 10g (10.1.3.1.0) TopLink Workbench.</li> <li>2. Save the new TopLink Workbench project to a new location.</li> </ol>
Release 1 (9.0.3)	<ol style="list-style-type: none"> <li>1. Open the existing project with the 10g (10.1.3.1.0) TopLink Workbench.</li> <li>2. Delete the passwords from all configured logins.</li> <li>3. Re-enter the passwords as plain (not encrypted) text for all configured logins.</li> <li>4. Export the <code>project.xml</code>. When you export the <code>project.xml</code>, the TopLink Workbench writes the login passwords using Java Cryptograph Extension (JCE) encryption (when using JDK 1.4 or higher). Use this new <code>project.xml</code> file at runtime.</li> <li>5. Save the new TopLink Workbench project to a new location.</li> </ol>

## Package Rename

Beginning with Release 1 (9.0.3), the base package for the entire TopLink product changed to **oracle.toplink**. To upgrade existing application source code which refers to TopLink API packages and existing TopLink Workbench projects previous to Release 1 (9.0.3), you must use the **Package Rename** tool.

You cannot use the TopLink Workbench's Rename Package function when migrating projects from earlier versions – you must use the Package Rename tool.

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**Note:** If you are upgrading from a version prior to Release 1 (9.0.3), you must convert the package names before you open your TopLink project(s) in 10g (10.1.3.1.0).

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Use the Package Rename tool on your:

- Source code
- Configuration files
- TopLink Workbench project files ( `.mwp`) that contain references to pre-Release 1 (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`).

## Running the Package Rename Tool

Use this procedure to upgrade your existing pre-Release 1 (9.0.3) application source code and TopLink Workbench projects to version 10g (10.1.3.1.0).

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 (10.1.3.1.0) 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
  - TopLink Workbench project files (`*.mwp`, `*.xml`)

## Updating Sessions XML Files

TopLink Workbench 10g (10.1.3.1.0) automatically updates your `sessions.xml` file, as needed. Simply open the file in 10g (10.1.3.1.0), update your data source information (if needed), and save the file.

In 10g (10.1.3.1.0), the `sessions.xml` file includes a `<login>` element that will override any login information included in your `project.xml`. Use one of the following approaches to correctly configure the session login:

- Use the 10g (10.1.3.1.0) `sessions.xml` (XSD) **with** the `<login>` element. You should include all login information in the `sessions.xml`.
- Use the 10g (10.1.3.1.0) `sessions.xml` (XSD) **without** the `<login>` element. Include all login information in the `project.xml` (or project class).

- Use the `project.xml` (or `project` class) without `sessions.xml`. Include all login information in the `project.xml` (or `project` class).
- Use the 9.0.4 `sessions.xml` file (DTD). The login information included in the `sessions.xml` will override any login information in the `project.xml` (or `project` class).

See "TopLink Sessions" in the *Oracle TopLink Developer's Guide* for complete details.

## Using Hosted XSD

For 10g (10.1.3.1.0), the XSD files for use with Oracle TopLink are included with the standard TopLink installation or available on OTN at:

<http://www.oracle.com/technology/oracleas/schema/>

Specifically, you can use the following XSD files:

- [http://www.oracle.com/technology/oracleas/schema/object-persistence\\_1\\_0.xsd](http://www.oracle.com/technology/oracleas/schema/object-persistence_1_0.xsd)
- [http://www.oracle.com/technology/oracleas/schema/sessions\\_10\\_1\\_3.xsd](http://www.oracle.com/technology/oracleas/schema/sessions_10_1_3.xsd)
- [http://www.oracle.com/technology/oracleas/schema/toplink-object-persistence\\_10\\_1\\_3.xsd](http://www.oracle.com/technology/oracleas/schema/toplink-object-persistence_10_1_3.xsd)
- [http://www.oracle.com/technology/oracleas/schema/toplink-was-ejb-jar\\_10\\_1\\_3.xsd](http://www.oracle.com/technology/oracleas/schema/toplink-was-ejb-jar_10_1_3.xsd)



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