#### Oracle® Application Server InterConnect

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Oracle Application Server InterConnect Adapter Publishing Engine User's Guide, 10g (9.0.4)

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# Preface

This preface contains these topics:

- Intended Audience
- Documentation Accessibility
- Related Documentation
- Conventions

## **Intended Audience**

This guide is intended for those who perform the following tasks:

- install applications
- maintain applications

## **Documentation Accessibility**

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## **Related Documentation**

For more information, see these Oracle resources:

- Oracle Application Server InterConnect User's Guide
- Oracle Application Server InterConnect Installation Guide
- Oracle Application Server InterConnect Adapter Configuration Editor User's Guide

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```
http://otn.oracle.com/documentation/
```

## 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 for Microsoft Windows Operating Systems

#### **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
Bold	Bold typeface indicates terms that are defined in the text or terms that appear in a glossary, or both.	When you specify this clause, you create an <b>index-organized table</b> .
Italics	Italic typeface indicates book titles or emphasis.	Oracle9i Database Concepts
		Ensure that the recovery catalog and target database do <i>not</i> reside on the same disk.
UPPERCASE monospace	Uppercase monospace typeface indicates elements supplied by the system. Such	You can specify this clause only for a NUMBER column.
(fixed-width) font	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	You can back up the database by using the BACKUP command.
		Query the TABLE_NAME column in the USER_ TABLES data dictionary view.
	objects and structures, usernames, and roles.	Use the DBMS_STATS.GENERATE_STATS procedure.
lowercase	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. <b>Note:</b> Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.	Enter sqlplus to open SQL*Plus.
monospace (fixed-width)		The password is specified in the orapwd file.
font		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	Lowercase italic monospace font	You can specify the parallel_clause.
italic monospace (fixed-width) font	represents placeholders or variables.	Run Uold_release.SQL where old_ release refers to the release you installed prior to upgrading.

#### **Conventions in Code Examples**

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

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

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

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

Convention	Meaning	Example
UPPERCASE	Uppercase typeface indicates elements supplied by the system. We show these	<pre>SELECT last_name, employee_id FROM employees;</pre>
	terms in uppercase in order to distinguish them from terms you define. Unless terms	SELECT * FROM USER_TABLES;
	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.	DROP TABLE hr.employees;
lowercase	Lowercase typeface indicates programmatic elements that you supply. For example, lowercase indicates names of tables, columns, or files.	<pre>SELECT last_name, employee_id FROM employees;</pre>
		sqlplus hr/hr
	<b>Note:</b> Some programmatic elements use a mixture of UPPERCASE and lowercase. Enter these elements as shown.	CREATE USER mjones IDENTIFIED BY ty3MU9;

#### **Conventions for Microsoft Windows Operating Systems**

The following table describes conventions for Microsoft Windows operating systems and provides examples of their use.

Convention	Meaning	Example
Choose Start >	How to start a program.	To start the Oracle Database Configuration Assistant, choose Start > Programs > Oracle - <i>HOME_NAME</i> > Configuration and Migration Tools > Database Configuration Assistant.
File and directory names	File and directory names are not case sensitive. The following special characters are not allowed: left angle bracket (<), right angle bracket (>), colon (:), double quotation marks ("), slash (/), pipe ( ), and dash (-). The special character backslash (\) is treated as an element separator, even when it appears in quotes. If the file name begins with \ then Windows assumes it uses the Universal Naming Convention.	c:\winnt"\"system32 is the same as C:\WINNT\SYSTEM32
C:/>	Represents the Windows command prompt of the current hard disk drive. The escape character in a command prompt is the caret (^). Your prompt reflects the subdirectory in which you are working. Referred to as the <i>command</i> <i>prompt</i> in this manual.	C:\oracle\oradata>
	The backslash (\) special character is sometimes required as an escape character for the double quotation mark	C:\>exp scott/tiger TABLES=emp QUERY=\"WHERE job='SALESMAN' and sal<1600\"
	(") special character at the Windows command prompt. Parentheses and the single quotation mark (') do not require an escape character. Refer to your Windows operating system documentation for more information on escape and special characters.	C:\>imp SYSTEM/password FROMUSER=scott TABLES=(emp, dept)
HOME_NAME	Represents the Oracle home name. The home name can be up to 16 alphanumeric characters. The only special character allowed in the home name is the underscore.	C:\> net start Oracle <i>HOME_</i> <i>NAME</i> TNSListener

Convention	Meaning	Example
ORACLE_HOME and ORACLE_ BASE	In releases prior to Oracle8 <i>i</i> release 8.1.3, when you installed Oracle components, all subdirectories were located under a top level <i>ORACLE_HOME</i> directory that by default used one of the following names:	Go to the ORACLE_BASE\ORACLE_ HOME\rdbms\admin directory.
	<ul> <li>C:\orant for Windows NT</li> </ul>	
	<ul> <li>C:\orawin95 for Windows 95</li> </ul>	
	<ul> <li>C:\orawin98 for Windows 98</li> </ul>	
	This release complies with Optimal Flexible Architecture (OFA) guidelines. All subdirectories are not under a top level ORACLE_HOME directory. There is a top level directory called ORACLE_BASE that by default is C:\oracle. If you install Oracle9 <i>i</i> release 1 (9.0.1) on a computer with no other Oracle software installed, then the default setting for the first Oracle home directory is C:\oracle\ora90. The Oracle home directory is located directly under ORACLE_BASE.	
	All directory path examples in this guide follow OFA conventions.	

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# **Publishing Engine**

This chapter provides an introduction to the Oracle Application Server InterConnect Adapter Publishing Engine. The following topics are discussed:

- What is the Publishing Engine?
- Key Management
- Using the Publishing Engine with Oracle Application Server InterConnect

# What is the Publishing Engine?

The Publishing Engine provides an event publication mechanism for systems that have no native publication mechanism (for example, PeopleSoft). The Publishing Engine tracks changes to the applications by periodically polling for changes to data from operator input. It essentially polls the application looking for predefined variables.

The Publishing Engine consists of three major components:

- Publishing Engine Adapter—Provides persistent storage of event definitions and the event browsing and selection capabilities.
- Publishing Agent—Responsible for the runtime polling and event publishing. It is started as part of the Oracle Application Server InterConnect application startup.
- Publishing Manager (pubmgr)—A command line tool used to administer and configure the Publishing Engine. The Publishing Manager can configure the Publishing Engine to poll for (and publish) any information retrieved from a system.

The events defined through the Publishing Manager appears in the component browser. You can browse and define published events in iStudio.

# Supported Platforms

Table 1-1 lists the platforms on which the Publishing Engine runs.

 Table 1–1
 Supported Platforms

Operating System	Version
Windows NT	Version 4.0 with Service Pack 6 or above
Windows 2000	With Service Pack 1 or above
HP-UX	11.0 and 11.11
Sun SPARC Solaris	8 and 9

## **Key Management**

To convert inbound polling calls into outbound published events, the Publishing Engine must be able to retrieve unpublished data. This is done by tracking (in persistent storage) the key fields of previously retrieved data. When the polling interval begins, the agent retrieves all data added/ changed/ deleted after the last stored key fields. After retrieving new data, the Publishing Engine publishes the data as an event and updates the stored key field. However, if no new data is retrieved, no event is generated. This cycle begins again during the next polling interval.

This process of storing and tracking key field values to retrieve only the data changed since the last polling interval is called Key Management. There are two main forms of key management recognized by the Publishing Engine:

- Internal Key Management
- External Key Management

#### Internal Key Management

Internal key management is where functionality, within the system itself, tracks the changes. With internal key management, the Publishing Engine does not need to store or manage keys itself. Instead, a business API is provided in the system that provides the user with all the new records since the last time this API was called. When the Publishing Engine polls this API, it may or may not retrieve records in the output set. If it retrieves records, it publishes them as a single event. Otherwise, it waits for the next polling interval.

To use internal key management with the Publishing Engine, the business API must either have no input parameters or one fixed-value input parameter. All other parameters must be output parameters (or input/output parameters for which the input can be empty). A fixed value input parameter is provided if the API supports multiple different callers. Each caller has a different value and the API stores caller-specific data previously retrieved.

The following is an example of an API that the Publishing Engine can support for internal key management:

There is one disadvantage to use internal key management: unless the system being called supports transactional calls, the Publishing Engine can only guarantee zeroor one-time publishing of events (it cannot guarantee exactly-one time publishing of events). The API call may succeed in the system itself (and the API updates and commits its internal key storage) but if, as the data is being transmitted back to the Publishing Engine, a network (or other) failure occurs, then the Publishing Engine will not receive the data and, therefore, cannot publish it. In order to provide exactly-one time event publishing external key management must be used.

#### **External Key Management**

External key management is similar to internal key management except that the Publishing Engine manages the persistent storage of the published key values. With external key management, the business APIs used by the Publishing Engine essentially retrieves all records whose key is greater than a given input key value. The Publishing Engine stores these key values, therefore, it can provide *exactly one time* event publishing in concert with the event queuing mechanism.

To use external key management with the Publishing Engine, the business API must have one input parameter used to pass in the last known key value. This parameter can also be an input/output (the output is ignored unless the output value is the updated, most recent key value). All other parameters must be output parameters (or input/output parameters for which the input can be empty).

In addition, the API provides two ways to retrieve the most recent key value:

- There must be an output parameter which is the most recent key value.
- There is a table output parameter, which contains a field for the key value where the table is sorted so that the last row in the table is the most recent key value.

The following is an example of an API that the Event Editor can support for external key management:

In these cases, the Publishing Engine persistently stores and tracks the last known key value and passes the most recent value into the API each time the API is called. The Publishing Engine stores the key values (as well as the event definitions) on a per-profile basis.

# Using the Publishing Engine with Oracle Application Server InterConnect

To use publishing engine with Oracle Application Server InterConnect, you need to:

- Define polled events by running the pubmgr tool.
- Define publish events for the Oracle Application Server InterConnect application in iStudio.
- Run the Oracle Application Server InterConnect application. This loads the Publishing Agent.
- If the events are configured to be manually triggered, you must launch the pubmgr and trigger the event. However, if the events are not manually triggered, the events will be triggered as soon as you start the application.

The Publishing Agent polls the system for the changes in data and reports the changes back to the Oracle Application Server InterConnect application.

#### **Defining Polled Events using Publishing Manager**

An event must be defined in the Publishing Manager to indicate its purpose. Use the following steps to define an event:

- 1. Change to the Installation directory\bin directory.
- 2. Type pubmgr iStudio and press Enter.

Figure 1–1 Creating an Event Definition using PUBMGR

```
MAPPCONS - pubmgr iStudio
C:\Oracle\Ora81\oai\4.1\bin>pubmgr iStudio
> help
Commands:

    list - show list of events
    show <catg> <event> - show details of an event
    add <catg> <event> - add a new event
    change <catg> <event> - change an existing event
    trigger <catg> <event> - remove an event
    export file> - export all event definitions
    import file> - replace all definitions with imported ones
    quit
> add Vendors Deleted
Polled API (method@impl): Execute@PeopleSoft://Queries/DELD_VENDORS
Input key argument: TimeStamp
Output key field: TIME_STAMP
Update interval: 1 minute
Time of last check: never
Most recent key value: 00000000012
> _
```

3. Type add to add a new event definition. For example:

add Vendors Deleted

This creates a Vendors category if it does not already exist and adds the Deleted event definition to that category.

**Note:** Type help to get the list of commands and their syntax.

**4.** Enter the polled API. This is the business API that is polled periodically by the Publishing Engine. For example:

Execute@PeopleSoft://Queries/DELD\_VENDORS

To find which URL to use, please refer to the iStudio section of your Adapter document. Follow the step up to the point where the Define Application View is populated. In the field for **Object Name** at the top of the screen, the URL will be displayed.

5. Enter the remaining parameters at the correct prompts.

See Also: "Publishing Manager Commands" on page 1-12

#### Defining a Published Event in iStudio

After you have defined the polled events for Publishing Engine, create the corresponding published events using iStudio.

Figure 1–2 Browsing Polled Events in iStudio

Component Selector	×		
🛅 All Components			
🖯 🐼 Publishing			
🖯 🐼 Bank			
NewAccount			
- 🖉 NewDept	₩ NewDept		
& <sup>®</sup> NewMsgEvt			
🖯 🔯 Vendors			
Deleted			
OK Cancel	Actional		

See Also: Oracle Application Server InterConnect User's Guide

#### Runtime Polling and Event Publishing using Publishing Engine

The publishing agent is responsible for the runtime polling and event publishing. It is started as part of the Oracle Application Server InterConnect application startup. Use the following steps to start this application:

- **1.** Run the Oracle Application Server InterConnect application to load the Publishing Agent.
- 2. If the events are configured to be manually triggered, you must launch the pubmgr and trigger the event. However, if the events are not manually triggered, the events will be triggered as soon as you start the application.

The Publishing Agent polls the system for the changes in data and reports the changes back to the Oracle Application Server InterConnect application.

Use the following steps to use the Publishing Engine on a Unix machine:

- 1. Export the event definition by using the command export *filename* in the pubmgr on Windows.
- 2. Import the file by typing import *filename* in the pubmgr.

All commands for running pubmgr and defining events is the same on Unix as it is on Windows.

#### **Publishing Manager Commands**

Use the Publishing Manager to configure and monitor the Publishing Engine. Use the Publishing Manager to publish an event or message to monitor. The information set in the Publishing Manager is stored in the config\pub.db file created on activation of the Publishing Manager.

From and command line:

```
pubmgr [{-p | -r} <script>] [<profile>]
```

where:

- -*r*—Records a script containing each of the commands performed interactively during the execution of this session of the publishing manager.
- -p—Plays back a previously recorded script.

Each event, defined with the Publishing Manager, is given a category for organizational purposes. Examples of possible categories are Customers, Vendors, or PurchaseOrders. When using the Publishing Manager, the category must always be specified along with the event name.

Table 1–2 describes each of the commands available within the Publishing Manager.

Command	Sytax	Example	Description
List list Category Event Interval		Lists all defined events grouped by	
			category. For each event the polling interval is also given.
		Customers All Manual	
Show	show		Shows the details of a particular event.
	<category> <event></event></category>	Folieu API: Execute@PeopleSoft://Oueries/VF	For more information on the arguments in this example refer to the description of the Add command.
		Input key argument: Vendor_ID	
		Output key argument: Result	
		Output key field: VENDOR_ID	
		Update interval: 1 minute	
		<b>Time of last check:</b> Fri Sep 01 15:19:28 2000	
		Most recent key value: 0000000044	

 Table 1–2
 Description of available commands

Command	Sytax	Example	Description
Add	add <category> <event></event></category>	add Vendors Deleted	Allows you to add a new event definition.
		Polled API (method@impl):	The polled API is the business API that is polled periodically by the Publishing
		Execute@PeopleSoft://Queries/DE	Engine.
		LD_VENDORS Input key argument: TimeStamp	The input key argument, for internal key management, is the name of the argument
		Output key argument: Result	that has a fixed value provided. This can
		Output key field: TIME_STAMP	be blank (input with a single period, "." if there is no input value. For external ke management this is the name of the argument used to pass in the stored key value.
		Most recent key value: 0000000012	
	Manually triggered (yes/no) [no]: Interval (minutes) [5]:	For external key management, if the output key is a standalone argument value, then the output key argument is the name of this argument and the output key field should be left blank (input with a single period, "."). If the output key is determined by examining a table, the output key argument is the name of the table argument and the output key field i the name of the key field within the table The most recent key value, for internal key management, actually represents the	
			fixed key value that is passed in to the input key argument each time the API is polled. For external key management this is the key value of the most recently synchronized data (data will be retrieved with key values after this entry).
			Polling of the business API can be either manually triggered (through the Trigger command) or automatically performed at a set interval (in minutes). The minimum polling interval is 1 minute. When entering values, press <b>Enter</b> to select the default value (shown between square brackets). However, unless an event has been set up to be triggered manually, it will be triggered at the interval entered in this field.

 Table 1–2
 Description of available commands (Cont.)

Command	Sytax	Example	Description
Change	change <category> <event></event></category>	change Vendors Created	Allows you to change existing event
		Implementation:[Execute@	definitions. This can be used to update any of the fields (including the most recent key value if publishing of information needs to be repeated for any reason). The syntax of this command is identical to Add except that default values are provided for each field. Press <b>Enter</b> to select the default value. In order to enter a
		PeopleSoft://Queries/VENDORS]:	
		Input key argument [Vendor_ID]:	
		Output key argument [Result]:	
		Output key field [VENDOR_ID]:	
		Most recent key value [0000000044]: 0000000020	blank value instead of the default input a single period (".") followed by <b>Enter</b> .
		Manually triggered (yes/no) [no]:	
		Interval (minutes) [1]:	
Trigger	trigger <category> <event></event></category>	trigger Customers All	Allows you to trigger an event for polling. After trigger is used, the event is scheduled for polling within the next minute. You can use trigger to manually poll event (otherwise they will never be polled). Alternately, you can use trigger on interval polled events so that the polling occurs faster than it might otherwise. This is only useful on interval polled events if the polling interval is greater than 1 minute.
Remove	remove <category> <event></event></category>	remove Customers All	Removes the specified event definition and stored key information. There is no undo for the remove operation, so it is recommended to either export or show the definition before removing.
Export	export <filename></filename>	export c:\Temp\events.xml	All values in the export format directly correspond to the values entered through Add.
Import	import <filename></filename>	import c:\Temp\events.xml	Imports previously exported events definitions. If the events in the file do not already exist, they are created. If any of the events specified in the import file already exists, it is overwritten with the information found in the import file. This is typically used to load deployed event definitions.

 Table 1–2
 Description of available commands (Cont.)

Command	Sytax	Example	Description
Replace	replace <filename></filename>	replace c:\Temp\events.xml	Similar to Import, it removes all existing event definitions and then imports the event definitions found in the file. Replace restores the Publishing Engine database to a previous state.
Help	help	help	Provides specific help using the following list of the possible commands.
quit	quit	quit C:\Oracle\ora81\oai\bin>	Quits the publishing manager. All changes are applied persistently as commands occur. Quit exits the manager. It does not affect the persistent store of the Publishing Engine. The Publishing Manager can be left running with commands applied periodically. However, if recording a script for later playback, the script is only written after a Quit command.

 Table 1–2
 Description of available commands (Cont.)

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