

Oracle® Application Server

Adapters for IMS/DB User's Guide

10g Release 3 (10.1.3.4)

E13832-01

December 2008

Oracle Application Server Adapters for IMS/DB User's Guide, 10g Release 3 (10.1.3.4)

E13832-01

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Preface

This guide is the primary source of user and reference information on OracleAS Adapters for IMS/DB, which enables client applications to access transactions running under IMS/DB through the Sun J2EE Connector Architecture (J2CA) API.

This document describes the features of OracleAS Adapters for IMS/DB.

This preface covers the following topics:

- [Audience](#)
- [Documentation Accessibility](#)
- [Related Documents](#)
- [Conventions](#)

Audience

This manual is intended for Oracle integration administrators who perform the following tasks:

- Installing and configuring OracleAS Adapters for IMS/DB
- Diagnosing errors
- Using OracleAS to access IMS/DB transactions

Note: You should understand the fundamentals of OracleAS, OC4J, the UNIX and Microsoft Windows operating system before using this guide to install or administer OracleAS Adapters for IMS/DB.

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Related Documents

For more information, see the following documents in the Oracle Other Product One Release 7.0 documentation set or in the Oracle Other Product Two Release 6.1 documentation set:

- *Oracle Application Server Adapter Concepts Guide*
- *Oracle Application Server Adapter Installation Guide*
- *Oracle Application Server Adapter Concepts Guide*
- *Oracle Application Server Containers for J2EE User's Guide*
- *Oracle Application Server Containers for J2EE Services Guide*
- *Oracle Application Server Containers for J2EE Security Guide*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	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.

Introduction

Oracle Application Server Adapter for IMS/DB (OracleAS Adapter for IMS/DB) provides connectivity and runs interactions on an Information Management System - Data Base (IMS/DB) system. This section provides an overview of the features and architecture of OracleAS Adapter for IMS/DB.

This section contains the following topics:

- [OracleAS Adapter for IMS/DB Overview](#)
- [OracleAS Adapter for IMS/DB Architecture](#)

OracleAS Adapter for IMS/DB Overview

IMS/DB (Information Management System - Data Base) is a high-performance hierarchical database. The data access API to IMS/DB is called DL/I, which is a function by which the IMS/DB database can be traversed and operated on. Working with DL/I requires the caller to run under the control of IMS/DB. APIs are also available to enable access to IMS/DB from CICS and IMS/TM transactions.

OracleAS Adapter for IMS/DB includes the following feature:

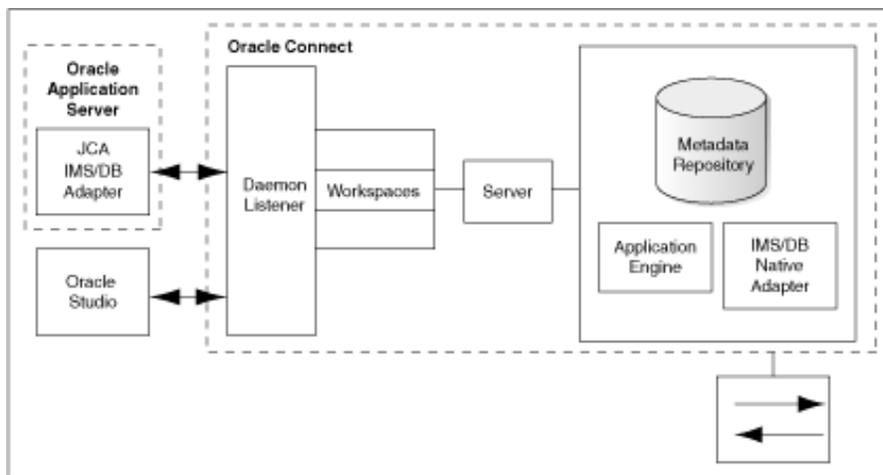
- Captures and maintains a metadata schema for IMS/DB by importing various IMS definition files such as a PSB file, DBD files, and COBOL copybooks. These are transformed into mapping definition for Oracle Connect for IMS/DB on the z/OS computer.
- Uses an enterprise application integration (EAI) model. Users of a requesting application can model the interactions that they want implemented, specifying what each interaction does, when it occurs, and the inputs and outputs expected for each interaction. Moreover, the OracleAS Adapter for IMS/DB maps data structures, facilitating access to IMS/DB data from within Oracle Application Server.
- Implements interactions as parameterized SQL with the parameters forming the input record, and with the output (in cases where there is an output) aggregated into an XML document forming the output record.
- Includes the options to access IMS/DB data managed by CICS, IMS/TM, or directly.
- Does support global transactions under CICS and can fully participate in a distributed transaction.

OracleAS Adapter for IMS/DB Architecture

OracleAS Adapter for IMS/DB includes the following components:

- J2CA 1.5 IMS/DB adapter: The J2CA IMS/DB adapter is a standard resource adapter that is compliant with J2EE Connector Architecture, therefore, providing J2EE components connectivity.
- Oracle Connect: Oracle Connect runs on the legacy system and handles requests from the J2CA 1.5 IMS/DB adapter, that runs within Oracle Application Server Containers for J2EE (OC4J).
- Oracle Studio: Oracle Studio is the configuration tool for Oracle Connect. Configuration tasks using Oracle Studio are performed on a Windows or Linux computer. Oracle Studio uses perspectives that enables you to generate specific information necessary to model OracleAS Adapter for IMS/DB.

The following figure illustrates the components of OracleAS Adapter for IMS/DB.



See Also: *Oracle Application Server Adapter Concepts Guide*

Integration Flow from Oracle Application Server to the Legacy Application

The J2CA 1.5 IMS/DB adapter converts the J2CA interaction invocation received from Oracle Application Server to the XML format and passes the XML format to Oracle Connect on the legacy server. The daemon listens for the request coming from the J2CA 1.5 IMS/DB adapter client and assigns a server process to handle the request. The properties of the server process, such as connection pooling requirements, are defined by a workspace definition within the daemon.

The server process includes an instance of the application engine, which converts the XML format into standard SQL which is passed to the data engine. The data engine processes the SQL to create an efficient strategy for retrieving the data from IMS/DB and then passes the SQL and execution strategy to the database back-end adapter. The database back-end adapter passes the SQL to the back-end driver, which converts the SQL to the language understood by IMS/DB and passes it to IMS/DB to be executed. The results of the SQL statement are passed back to the application engine, through the back-end adapter, where these results are converted to XML and passed back to the client.

Installing and Configuring the OracleAS Adapter for IMS/DB

This section describes how to install Oracle Connect and Oracle Studio, and how to configure Oracle Connect using Oracle Studio.

Note: In addition to the installation procedures described in this section, the J2CA 1.5 IMS/DB adapter must be installed with Oracle Application Server. Installing the J2CA 1.5 IMS/DB adapter is described in *Oracle Application Server Adapter Installation Guide*.

This section includes the following topics:

- [Preinstallation Tasks](#)
- [Installing Oracle Connect on an IBM z/OS Series Platform](#)
- [Updating an Existing Oracle Connect Installation with IMS/DB](#)
- [Installing Oracle Studio](#)
- [Configuring Oracle Connect](#)

Preinstallation Tasks

Before installing OracleAS Adapter for IMS/DB, ensure that your computer meets the following requirements:

- [IBM z/OS Hardware and Software Requirements](#)

IBM z/OS Hardware and Software Requirements

This section describes the following requirements for installing Oracle Connect on an IBM z/OS platform:

- [Hardware Requirements](#)
- [Software Requirements](#)

Hardware Requirements

The following table summarizes the hardware requirements for Oracle Connect.

Table 2–1 Oracle Connect Hardware Requirements

Hardware Component	Requirements
Processor	An IBM zSeries computer.
Memory	The minimum requirement is 4MB for each connection. A connection is defined as a connection to a server process or daemon. The actual memory requirement depends on such things as the size of the database and the number of databases accessed.
Disk Space (3380 and 3390 disks)	150 cylinders.

Software Requirements

The following table summarizes the software requirements for Oracle Connect:

Table 2–2 Oracle Connect Software Requirements

Software Component	Requirements
Operating System	IBM z/OS
CICS TP Monitor (if accessing IMS/DB data under CICS)	V4R1 or higher (recommended to use CICS V6R1 or higher) CICS EXCI support must be installed and IRCSTRT=YES must be specified in the CICS initialization parameters, so that the IRC (Inter Region Communication) starts. You can also set the IRC to open by issuing the following command: CEMT SET IRC OPEN. Also the IBM group DFH\$EXCI (or an equivalent user-defined group) must be installed in the CICS region: using the CEDA RDO facility.
TCP/IP	The operating system must support the TCP/IP protocol for using the Internet
C Runtime Library	The C runtime library has all the standard C runtime programs.
Oracle Application Server	Oracle Application Server 10g (10.1.3.4).

Installing Oracle Connect on an IBM z/OS Series Platform

This section explains how to install Oracle Connect. This section includes the following:

- [Installation Worksheet](#)
- [Preinstallation Tasks](#)
- [Importing the Installation Kit](#)
- [Installation Instructions](#)
- [Post-Installation Instructions](#)

Note: If you have an Oracle Connect back-end adapter already installed on the IBM z/OS platform, follow the instructions described in ["Updating an Existing Oracle Connect Installation with IMS/DB"](#) on page 2-11.

The other back-end adapters that run on an IBM z/OS platform include:

- OracleAS Adapter for CICS
 - OracleAS Adapter for IMS/TM
 - OracleAS Adapter for VSAM
-

Installation Worksheet

Verify that you have all the information detailed in the following installation worksheets, so you can refer to it during the configuration process.

Table 2–3 Preinstallation Information

Topic	Required Information	Default	Comment
General	Operating system	-	z/OS
-	Disk space	-	150 cylinders.
-	Memory	-	The minimum requirement is 4MB for each connection. A connection is defined as a connection to a server process or daemon. The actual memory requirement depends on such things as the size of the database and the number of databases accessed.
-	Installation high-level qualifier	OCL10134	-
-	Volume	-	-
-	Unit	3390	SMS only: unit where SMS resides.
-	Output class	A	-
-	JCL job card	-	An optional card (up to 6 lines) to replace the prefix job (entered as it will appear in the job).
-	ISPF load library name	ISP.SISPLOAD	-
CICS	CICS EXCI load library name	CICS.CICS.SDFHEXCI	To access IMS/DB data under CICS.

Table 2–4 Required Permissions

Permission
Permission to define an APF-authorized library
Permission to write to an active proclib, such as user.proclib
Permission to read the CICS EXCI library (when accessing IMS/DB data under CICS)
Permission to update the security manager, such as RACF
Optionally, permission to specify an output class for Oracle Connect output

Table 2–5 Installation Checklist

Step	Comment/Outputs
tso profile noprefix	Ensures that the user name is not used as part of the dataset name allocated in the next steps.
Allocate dataset: {HLQ}.TRANSMIT.KIT	130 tracks (3390), format=FB, record length=80, block size=3120
Allocate dataset: {HLQ}.TRANSMIT.LOAD	500 tracks (3390), format=FB, record length=80, block size=3120
FTP files to z/OS	FTP using binary mode.
RECEIVE INDSNAME('{HLQ}.TRANSMIT.KIT')	-
da('{HLQ}.TRANSMIT.LIB') UNIT(unit) VOLUME(volume)	-
EX {HLQ}.TRANSMIT.LIB(PREPARE)	Successful MAXCC is 0, 4 or 8 BUILDKIT.SRC, BUILDKIT.LOAD and BUILDKIT.GENDEMO created.
EX {HLQ}.BUILDKIT.SRC(NAVINST)	Successful MAXCC is 0 or 4.

Preinstallation Tasks

Before starting the installation, ensure that you have the following information available:

- The output class for the installation output if you do not want to use the default value, which is A
- If you use SMS to manage all datasets (you cannot provide unit and volume information), then the unit where SMS resides.

Before starting the installation, ensure that you have the following permissions:

- Permission to define an APF-authorized library.
- Permission to write to an active proclib, such as user.proclib.
- Permission to read the CICS EXCI library, when accessing IMS/DB data under CICS.
- Permission to update the security manager, such as RACF.

Note: Optionally, ensure that you have permission to specify an output class for Oracle Connect output. Assigning a device which is set on HOLD prevents the loss of log information when Oracle Connect started tasks finish.

Oracle Connect for the IBM z/OS platform is contained in the following datasets:

- OCL10134.TRANSMIT.KIT
- OCL10134.TRANSMIT.LOAD

These datasets are provided in the following directory.

Oracle_Connect\IMSDB_Legacy_Adapter

Importing the Installation Kit

Perform the following steps on the mainframe to import Oracle Connect installation kit to the mainframe:

1. Run the following command:

```
tso profile noprefix
```

The user name will not be used as part of the dataset name. On some systems this is the default.

2. Allocate datasets with the following space for each of these files:

- OCL10134.TRANSMIT.KIT = 130 tracks (3380 and 3390 disks)
- OCL10134.TRANSMIT.LOAD = 500 tracks (3380 and 3390 disks)

For each dataset: RECFM=FB and LRECL=80. The block size is 3120.

3. Using FTP, copy OCL10134.TRANSMIT.KIT and OCL10134.TRANSMIT.LOAD in binary mode to the mainframe. You can replace the OCL10134 high-level qualifier to any qualifier you want.

Installation Instructions

Perform the following steps to install Oracle Connect:

1. Run the following command at the TSO prompt:

```
RECEIVE INDSNAME('nnn.TRANSMIT.KIT')
```

Where *nnn* represents the high-level qualifier you want to assign for the Oracle Connect installation. Assign the high-level qualifier you specified in step 7 of the preinstallation tasks. The default value is OCL10134.

Note: You can use more than one high-level qualifier (such as ACME.DEV.OCL10134) with the following conditions:

- The total length must be less than or equal to twenty characters.
 - The words transmit and buildkit cannot be used as high-level qualifiers.
-

2. Enter the following command when prompted for the restore parameters:

```
da('nnn.TRANSMIT.LIB') [UNIT(unit) VOLUME(volume)]
```

This extracts the *nnn.TRANSMIT.LIB* library from the *nnn.TRANSMIT.KIT* kit to the specified unit and volume. If a unit and volume are not specified the library is extracted to the current unit and volume.

3. Execute the PREPARE member of the *nn.TRANSMIT.LIB* library:

```
ex PREPARE
```

Follow the instructions in the Response column in [Table 2-6](#) for each entry in the Screen column.

Table 2–6 Installation Prepare Job Prompts and Responses

Screen	Response
DO YOU WANT TO USE SMS MANAGED STORAGE FOR THIS INSTALLATION Y/N [N] :	If you want to manage the storage using SMS, then answer Y, otherwise answer N.
ENTER THE STORCLASS FOR INSTALLATION TEMP DATASETS [] :	This prompt is displayed only if SMS is used to manage the installation (you answered Y to the first prompt). Enter the storage class.
ENTER THE UNIT NAME FOR INSTALLATION TEMP DATASETS [3390] :	If a storage class is not specified, then enter the unit name for temporary datasets used during the installation procedure.
ENTER THE VOLUME NAME FOR INSTALLATION TEMP DATASETS :	This prompt is displayed only if SMS is not used to manage the installation (you answered N to the first prompt). The volume name for temporary datasets used during the installation procedure.
ENTER THE OUTPUT CLASS FOR INSTALLATION OUTPUT [A] :	Enter the output class only if you do not want the default class used (the default is A)
DO YOU WANT TO USE THE DEFAULT JOB CARD Y/N [Y]	A job card is displayed. If you want to use a replacement card, then it must be entered as it will appear in the job. You can enter up to six lines. Enter a blank card to end input. If you do not enter a card, then the Oracle Connect default card is used.
DO YOU WANT TO PERFORM A MANUAL (M) OR AUTOMATIC (A) INSTALLATION [A] :	If you want to review the JCL used to install Oracle Connect, before it is submitted, then respond M for a manual installation.
PLEASE REVIEW AND SUBMIT FOR EXECUTION THE HLQ.TRANSMT.LIB(INSTJO)	This prompt is displayed only if a manual installation is requested (you answered M to the previous prompt).

The following libraries are generated:

```

nnn.BUILDKIT.LOAD
nnn.BUILDKIT.SRC
nnn.BUILDKIT.GENDEMO

```

Where *nnn* is the high-level qualifiers you assigned in step 1.

4. In the *nnn.BUILDKIT.SRC* library, execute the NAVINST member:

```
ex NAVINST
```

Follow the instructions in the Response column in the following table for each entry in the Screen column.

Table 2–7 Installation Prompts and Responses

Screen	Response
DO YOU WANT TO USE SMS MANAGED STORAGE FOR THIS INSTALLATION Y/N [N] :	If you want to manage the storage using SMS, then answer Y, otherwise answer N.
THE SOFTWARE WILL BE INSTALLED UNDER THE HIGH LEVEL QUALIFIER THAT YOU WILL CHOOSE. ENTER THE HIGH LEVEL QUALIFIER ["QUALIFIER"] :	The high-level qualifier for the installation (referred to as <i>INSTROOT</i> throughout this guide). You can use more than one high-level qualifier (such as <i>ACME.DEV.VA10</i>). The total length must be less than or equal to twenty characters. The qualifiers can be the same as the ones used for the installation (step 1). The words <i>transmit</i> and <i>buildkit</i> cannot be used as high-level qualifiers.
ENTER THE STORCLASS FOR TEMP DATASETS ['STORCLASS'] :	This prompt is displayed only if SMS is used to manage the installation (you answered Y to the first prompt). Enter the storage class.
ENTER THE UNIT NAME FOR INSTALLATION TEMP DATASETS [3390] :	The unit name for temporary datasets used during the installation procedure.
ENTER THE VOLUME NAME FOR INSTALLATION TEMP DATASETS :	This prompt is displayed only if SMS is not used to manage the installation (you answered N to the first prompt). The volume name for temporary datasets used during the installation procedure.
PLEASE CONFIRM (YES/NO/QUIT) [YES] :	Confirm the entered details.
ENTER THE OUTPUT CLASS FOR INSTALLATION OUTPUT [A] :	Enter the output class for Oracle Connect output. Assigning a device which is set on <i>HOLD</i> prevents the loss of log information when the Oracle Connect started tasks finish (the default is A).
DO YOU WANT TO USE THE DEFAULT JOB CARD Y/N [Y]	A job card is displayed. If you want to use a replacement card, then it must be entered as it will appear in the job. You can enter up to six lines. Enter a blank card to end input. If you do not enter a card, then the Oracle Connect default card is used.
ADDING AND UPDATING ORACLE CONNECT FOR IMS/DB CONFIGURATION ON THIS MACHINE, FROM A REMOTE ORACLE ADMINISTRATION CONSOLE, CAN ONLY BE DONE BY SOMEONE DEFINED AS AN ADMINISTRATOR FOR ORACLE CONNECT ON THIS MACHINE. ENTER A VALID USER NAME FOR AN ORACLE CONNECT ADMINISTRATOR [ALL]:	To manage Oracle Connect on this computer from Oracle Studio, you need to enter a user account of a user who will have administrative authorization, or press Enter to enable any user to administer Oracle Connect on this computer. The administrative rights can be changed from within Oracle Studio after the installation.
DO YOU WANT TO PERFORM A MANUAL (M) OR AUTOMATIC (A) INSTALLATION [A]:	If you want to review the JCL used to install Oracle Connect, before it is submitted, then respond M for a manual installation.
PLEASE REVIEW AND SUBMIT FOR EXECUTION THE DSN1 (INSTJBOR)	This prompt is displayed only if a manual installation is requested (you answered M to the previous prompt). DSN1 is the dataset name where <i>INSTJBOR</i> is located.

5. In the *nnn.BUILDKIT.SRC* library, execute the *IMSDB* member:

ex *IMSDB*

Follow the instructions in the Response column in for each entry in the Screen column.

Table 2–8 IMS/DB Adapter Installation Prompts and Responses

Screen	Response
ENTER DBD LIBRARY NAME	Enter the IMS DBD Library name for IMS on your system
ENTER PSB LIBRARY NAME	Enter the IMS PSB Library name for IMS on your system
ENTER RES LIBRARY NAME	Enter the IMS RES Library name for IMS on your system
ENTER PROC LIBRARY NAME	Enter the IMS PROC Library name for IMS on your system
ENTER PGM LIBRARY NAME	Enter the IMS PGM Library name for IMS on your system
ENTER YOUR PSB NAME	Enter the name of the PSB file with the name of your IMS database.
YOUR DBDLIB IS: YOUR PSBLIB IS: YOUR RESLIB IS: YOUR PROCLIB IS: YOUR PGMCLIB IS: YOUR PSBNAME IS: PLEASE CONFIRM (YES/NO/QUIT) :YES: :	This is a summary of the IMS questions. Check the summary to be sure all is correct. You can select: <ul style="list-style-type: none"> ■ Yes, to use the IMS database as configured ■ No, to not use the IMS database ■ Quit, to leave the CUST process
DO YOU WANT ORACLE CONNECT TO WORK WITH IMS/DB UNDER CICS	If you want Oracle Connect to work with IMS/DB under CICS, then answer Y, otherwise answer N.
ENTER THE CICS EXCI LOAD LIBRARY NAME [CICSTS13.CICS.SDFHEXCI]:	Enter the CICS EXCI load library name only if you do not want the default
PLEASE CONFIRM (YES/NO/QUIT) [YES]:	Confirm the entered details

The installation is completed. All JCL jobs and REXX procedures are written to the *INSTROOT*.USERLIB library. *INSTROOT* is the high-level qualifier for the installation.

Post-Installation Instructions

The following post-installation tasks must be done to work with Oracle Connect:

- [Post-Installation Procedures](#)
- [Starting the Daemon](#)
- [Setting Up Oracle Connect for Reentrancy](#)

Post-Installation Procedures

Perform the following procedures after completing the installation to configure Oracle Connect.

- Allocate a dataset for *INSTROOT*.DEF.BRANDBIN, using 1 track and with RECFM=VB and LRECL=256. The block size is 6233.

INSTROOT is the high-level qualifier where Oracle Connect is installed.

Using FTP, copy the BRANDBIN file, in binary mode, from the Oracle Connect\IMSDB Legacy Adapter directory to the mainframe, to *INSTROOT*.DEF.BRANDBIN.

- Define the LOADAUT library as an APF-authorized library

Note: To define a DSN as APF-authorized, in the SDSF screen enter the command:

```
"/setprog apf,add,dsn=INSTROOT.loadaut,volume=vol1002"
```

where *vol1002* is the volume where you installed Oracle Connect and *INSTROOT* is the high-level qualifier where Oracle Connect is installed.

If the site uses SMS, then when defining APF-authorization in the SDSF screen, enter the following command:

```
"/setprog apf,add,dsn=INSTROOT.loadaut,SMS"
```

Ensure that the library is APF-authorized, even after an IPL (reboot) of the computer.

- Move the *INSTROOT.USERLIB (ATTDAEMN)* and *INSTROOT.USERLIB (ATTSRVR)* members to any active proclib, such as *user.proclib*, *ATTDAEMN* and *ATTSRVR* are run as started tasks.

If you decide to change the name of the *ATTSRVR* member when you move it to a general high-level qualifier, then change the name specified in the *StartupScript* parameter in the daemon configuration to the new name:

- Run *INSTROOT.USERLIB (NAVCMND)* and enter `EDIT DAEMON IRPCDINI` at the prompt.
- Change the *startupScript* parameter from *ATTSRVR* to the new name for the server:

```
<Workspace name="Navigator"
  startupScript="NEW_NAME"
  serverMode="reusable"
  ... />
```

- Exit and save the change.
- Change the following line in the *ATTDAEMN* script to include the IP address and port of the IBM z/OS platform.

For example, before:

```
// PARM='-B START IRPCDINI'
```

After:

```
// PARM='-B -L ip_address:2551 START IRPCDINI'
```

Where *ip_address* specifies the IP address of the computer, 2551 is the default port for starting the daemon and *IRPCDINI* is the default daemon configuration.

- The *ATTDAEMN* and *ATTSRVR* started tasks need permission to use an Open Edition TCP/IP stack. The owner must be a user with OMVS segment defined and OMVS UID= 0000000000.
- In the security manager, such as RACF, define *ATTDAEMN* and *ATTSRVR* with a started task class and a general profile that enables the following:
 - Permission to issue master console commands.
 - START authority for the *ATTSRVR* job.

- Access to an Open z/OS segment (that defines access to TCP/IP OA sockets).
- ALTER authority on datasets under *INSTROOT* (to access to read, write, allocate and delete datasets under *INSTROOT*).
- The installation includes a PS, *INSTROOT.DEF.GBLPARMS*, that contains global environment information. This PS is read at startup and the correct software version is used, based on the details provided in the startup task.

If you change the location of this member, you must also change the relevant cards in the following jobs to the new locations:

- ATTSRVR: located in an active proclib, such as *user.proclib*
- ATTTDAEMN: located in an active proclib, such as *user.proclib*
- NAVSQL: located in *INSTROOT.USERLIB*
- The input during the installation procedure is written to *nnn.BUILDKIT.SRC(PARS)*. You can use this file to provide the same inputs if you rerun the installation, where *nnn* is the high-level qualifier you assign for the installation.
- For information about specifying Oracle Connect as the service using port 2551 in the TCP/IP network services file, consult TCP/IP documentation.

Starting the Daemon

Activate *INSTROOT.USERLIB(ATTTDAEMN)* as a started task to invoke the daemon. For example, in the SDSF screen enter the following:

```
 '/s ATTTDAEMN'
```

Where *INSTROOT* is the high-level qualifier where Oracle Connect is installed.

To submit the daemon as a job, uncomment the first two lines of the *ATTTDAEMN JCL*, change the PARM line as described earlier, and run the job using the subcommand. The *ATTTDAEMN JCL* is similar to the following:

```

/*ATTTDAEMN JOB 'RR', 'TTT',MSGLEVEL=(1,1),CLASS=A,
/* MSGCLASS=A,NOTIFY=&SYSUID,REGION=8M
//STEP1 EXEC PGM=IRPCD,
// PARM='-B START IRPCDINI'
/* PARM='-B -L :8883 START'
//STEPLIB DD DSN=INSTROOT.LOADAUT,DISP=SHR
//SYSPRINT DD SYSOUT=A
//GBLPARMS DD DSN=INSTROOT.DEF.GBLPARMS,DISP=SHR
// EXEC PGM=IRPCD,COND=((1,EQ,STEP1),(2,EQ,STEP1)),
// PARM='-KATTTDAEMN START ''INSTROOT.DEF.IRPCDINI'' '
//STEPLIB DD DSN=INSTROOT.LOADAUT,DISP=SHR
//SYSPRINT DD SYSOUT=A
//GBLPARMS DD DSN=INSTROOT.DEF.GBLPARMS,DISP=SHR
//SYSDUMP DD DUMMY

```

Setting Up Oracle Connect for Reentrancy

All Oracle Connect load modules are reentrant to enable sub-tasking. Therefore, move *INSTROOT.LOAD* to the Link Pack Area (LPA).

Where *INSTROOT* is the high-level qualifier where Oracle Connect is installed.

Using the LPA reduces real storage usage (because everyone shares the LPA copy) and fetch time.

Note: If you intend on using impersonation, so that you can run in a security context that is different than the context of the process that owns the server, then do the following:

- Place the `INSTROOT.LOAD(ATYSVCW)` member in an APF-authorized library outside the LPA.
- Change the `ATTSRVR` member (located in the active proclib), by adding the following to the STEPLIB list:

```
// DD DSN=apf_library,DISP=SHR
```

Where `apf_library` is the APF-authorized library outside the LPA where the `ATYSCVW` member was moved.

Setting Up Oracle Connect to Update IMS/DB Data

Perform the following to set up Oracle Connect so that you can update IMS/DB data.

IMS/DB Running Under CICS To set up Oracle Connect so that you can update IMS/DB data from a CICS transaction, copy the `ATYDBCTL` load module from `INSTROOT.LOAD` to a CICS `DFHRPL` library (such as `CICS.USER.LOAD`) and then define the `ATYDBCTL` program under CICS using any available group such as `ORA` group:

```
CEDA DEF PROG(ATYDBCTL) G(ORA) LANG(C) DA(ANY) DE(ORACLE IMSDB UPDATE PROG)
```

Where `INSTROOT` is the high-level qualifier where Oracle Connect is installed.

After defining the `ATYDBCTL` program to a group, install it as follows:

```
CEDA IN G(ORA)
```

IMS/DB Not Running Under CICS To enable Oracle Connect to create and delete IMS/DB data, run the following JCL:

```
// IDCYSIN DD DSN=&&IMSDB,DISP=(NEW,DELETE,DELETE) ,
// SPACE=(TRK,(1)),UNIT=SYSDA,
// DCB=(BLKSIZE=3200,LRECL=80,RECFM=FB)
```

Updating an Existing Oracle Connect Installation with IMS/DB

Verify that you have all the information detailed in the following installation worksheets, so you can refer to it during the configuration process.

Table 2–9 Preinstallation Information

Topic	Required Information	Default	Comment
CICS	CICS EXCI load library name	CICS.CICS.SDFHEXCI	-

Table 2–10 Required Permissions

Permission
Permission to read the CICS EXCI library

In the `nnn.BUILDKIT.SRC` library, execute the `IMSDB` member:

```
ex IMSDB
```

Follow the instructions in the Response column in for each entry in the Screen column.

Table 2–11 IMS/DB Adapter Installation Prompts and Responses

Screen	Response
ENTER DBD LIBRARY NAME	Enter the IMS DBD Library name for IMS on your system
ENTER PSB LIBRARY NAME	Enter the IMS PSB Library name for IMS on your system
ENTER RES LIBRARY NAME	Enter the IMS RES Library name for IMS on your system
ENTER PROC LIBRARY NAME	Enter the IMS PROC Library name for IMS on your system
ENTER PGM LIBRARY NAME	Enter the IMS PGM Library name for IMS on your system
ENTER YOUR PSB NAME	Enter the name of the PSB file with the name of your IMS database.
YOUR DBDLIB IS: YOUR PSBLIB IS: YOUR RESLIB IS: YOUR PROCLIB IS: YOUR PGMLIB IS: YOUR PSBNAME IS: PLEASE CONFIRM (YES/NO/QUIT) :YES: :	This is a summary of the IMS questions. Check the summary to be sure all is correct. You can select: <ul style="list-style-type: none"> ■ Yes, to use the IMS database as configured ■ No, to not use the IMS database ■ Quit, to leave the CUST process
DO YOU WANT ORACLE CONNECT TO WORK WITH IMS/DB UNDER CICS	If you want Oracle Connect to work with IMS/DB under CICS, then answer Y, otherwise answer N.
ENTER THE CICS EXCI LOAD LIBRARY NAME [CICSTS13.CICS.SDFHEXCI]:	Enter the CICS EXCI load library name only if you do not want the default
PLEASE CONFIRM (YES/NO/QUIT) [YES]:	Confirm the entered details

The installation is completed. All JCL jobs and REXX procedures are written to the *INSTROOT*.USERLIB library. *INSTROOT* is the high-level qualifier for the installation.

After completing the installation, perform post-installation tasks, as described in "[Post-Installation Instructions](#)" on page 2-8, as required.

Installing Oracle Studio

The following sections explain how to install Oracle Studio.

- [Oracle Studio Requirements](#)
- [Installing Oracle Studio on Windows](#)
- [Installing Oracle Studio on Linux](#)

Note: If you have Oracle Studio version 10.1.3.4 or higher installed on your computer because you are using an Oracle AS legacy adapter or OracleAS CDC adapter, you do not need to reinstall it. If you have an older version of Oracle Studio, you must install the newest version.

Oracle Studio Requirements

The following are the hardware requirements for Oracle Studio:

- Processor: Intel or 100% compatible computer, based on a Pentium processor.

- Memory: 256 MB
- Disk space: 120 MB of free disk space

You can install Oracle Studio on the following operating systems:

- Windows XP with Service Pack 2 or higher
 - Windows 2003
 - Windows Vista
- Linux OS with GTK

Installing Oracle Studio on Windows

Oracle Studio is installed with a standard install wizard. Do the following to install Oracle Studio.

- Run the installation file, either using the Run option in the Windows Start menu or through Windows Explorer. Follow the instructions on the wizard screen.

Installing Oracle Studio on Linux

The Oracle Studio installation on Linux can be carried out by one of the following:

- Installing Oracle Studio with the Wizard (SH installation)
- Installing with a Silent Installation (RPM)

Installing Oracle Studio with the Wizard (SH installation)

You can install Oracle Studio by using the installation wizard. This allows you to easily carry out any standard or custom installation. Do the following for the Linux SH installation.

1. Install into a directory where you have permission.
2. Change the mode to execute mode. Type in:

```
chmod +x <file name>
```

3. Enter the following:

```
./ <file name>
```

If you are not installing to the current directory, enter the full path.

Installing with a Silent Installation (RPM)

You can use the Linux RPM method to install Oracle Studio. Do the following to carry out a silent installation on Linux.

- Enter the following:

```
rpm -i <file name>
```

You can use RPM parameters to create a custom installation.

Configuring Oracle Connect

All modeling of Oracle Connect is performed using Oracle Studio. To use Oracle Studio, you first configure it to enable access to the IBM z/OS platform where the IMS/DB data resides.

To configure Oracle Connect, refer to the following sections:

- [Setting Up the IBM z/OS Platform in Oracle Studio](#)

- [Securing Access to Oracle Connect](#)
- [Modeling Interactions for OracleAS Adapter for IMS/DB](#)

Note: The following tasks assume you have permission to access the IBM z/OS platform and that the Oracle Connect daemon is running on this computer.

Check with the system administrator to ensure these requirements are fulfilled.

Setting Up the IBM z/OS Platform in Oracle Studio

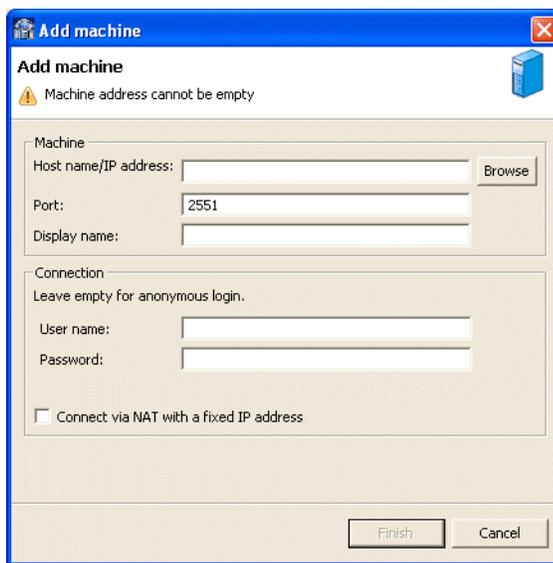
Using Oracle Studio, perform the following steps to configure the IBM z/OS platform:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**. Oracle Studio opens, displaying the Design perspective.
2. Right-click **Machines** in the Configuration Explorer and select **Add Machine**. The Add Machine screen is displayed (see [Figure 2-1](#)).
3. Enter the name of the computer you want to connect to, or click **Browse** to select the computer from the list of computers that is displayed and which use the default port (2551).
4. Specify the username and password of the user who was specified as the administrator when Oracle Connect was installed.

Note: Selecting **Anonymous connection** enables anyone having access to the computer to be an administrator, if this was defined for the computer.

The Add Machine screen is shown in the following figure:

Figure 2-1 The Add Machine screen



5. Click **Finish**.

The computer is displayed in the Configuration Explorer.

Securing Access to Oracle Connect

Oracle Studio includes mechanisms to secure access to Oracle Connect both during modeling and at run time.

During modeling, the following security mechanisms can be applied:

- [Setting Password Access to Oracle Studio](#)
- [Specifying Users with Administrative Rights](#)

At run time client access to Oracle Connect is provided by the user profile:

- [Setting Up Run-Time User Access to the IBM z/OS Platform](#)

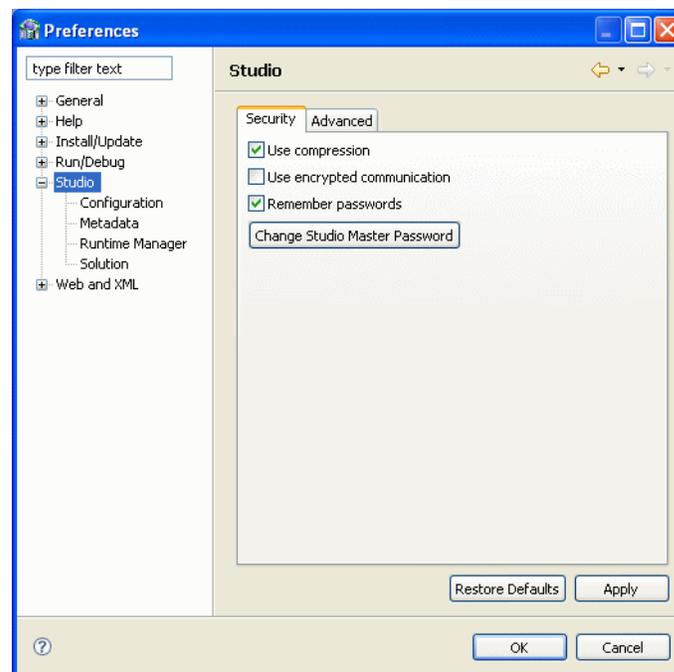
Setting Password Access to Oracle Studio

Initially, any operation performed using Oracle Studio does not require a password. You can set a password so that the first operation that involves accessing the server from Oracle Studio requires a password to be entered.

Perform the following steps to set password access to Oracle Studio:

1. From the **Start** menu, select, **Programs, Oracle**, and then select **Studio**. Oracle Studio opens.
2. From the **Window** menu, select **Preferences**. The Preferences screen is displayed.
3. Select **Studio** as shown in the following figure:

Figure 2–2 The Preferences screen



4. Click **Change Studio Master Password**. The Change Master Password screen is displayed, as shown in the following figure:

Figure 2–3 The Change Master Password Screen

5. Leave the **Enter Current Master Password** field blank and type a new master password.
6. Confirm the password.
7. Click **OK**.

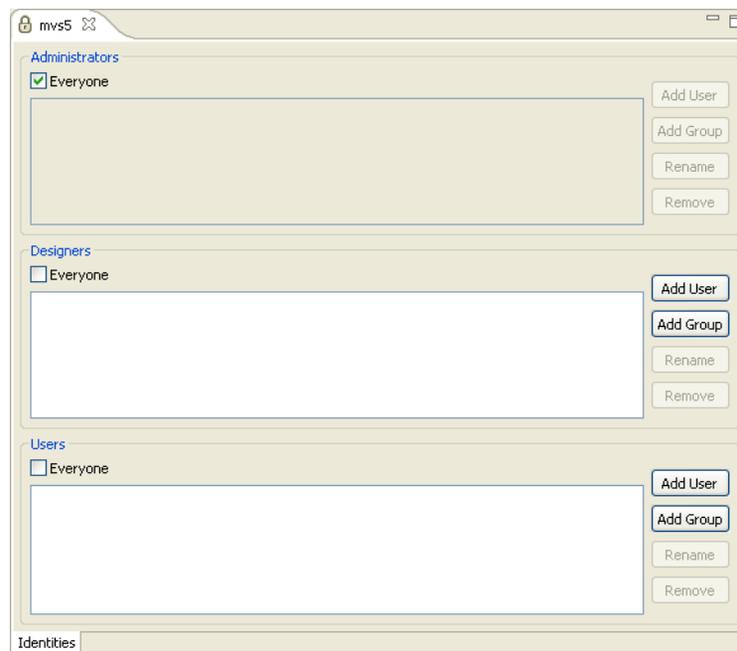
Specifying Users with Administrative Rights

By default, only the user who was specified during the installation as an administrator has the authorization to modify settings on that computer from Oracle Studio. This user can then authorize other users to make changes or to view the definitions for a selected computer. Adding a computer to Oracle Studio is described in ["Setting Up the IBM z/OS Platform in Oracle Studio"](#) on page 2-14.

Note: The default during installation is to enable all users to be administrators.

1. From the **Start** menu, select, **Programs, Oracle**, and then select **Studio**. Oracle Studio opens.
2. In the Design perspective Configuration view, Right-click the computer and select **Administration Authorization**.

The Administration Authorization screen is displayed as shown in the following figure:

Figure 2–4 The Administration Authorization screen

The screen has the following sections:

Administrators: Administrators can view and modify all the definitions in Oracle Studio for the selected computer. On initial entry to Oracle Studio, every user is defined as a system administrator.

Designers: Designers can view all the definitions for the computer in Oracle Studio and can modify any of the definitions under the **Bindings** and **Users** nodes for the selected computer. For example, Oracle Studio database administrator can add new data sources and adapters and can change metadata definitions for a table in a data source.

Users: Users can view all the definitions for the computer in Oracle Studio for the selected computer. Regular users cannot modify any of the definitions.

3. Add users or groups of users by clicking **Add User** or **Add Group** for the relevant sections.

The user or group that is added must be recognized as a valid user or group for the computer. Once a name has been added to a section, only the user or group who logs on with that user name has the relevant authorization.

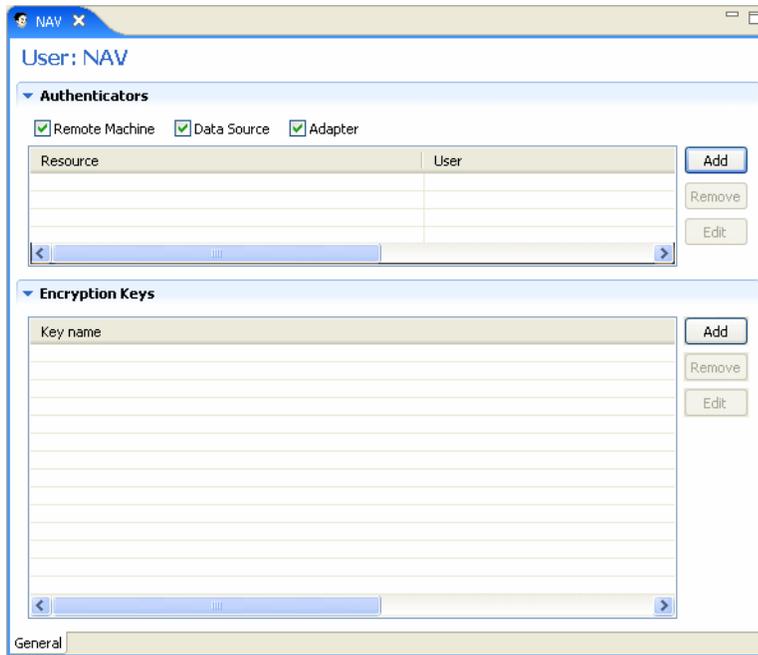
Setting Up Run-Time User Access to the IBM z/OS Platform

During run time, client access to Oracle Connect is provided by the user profile. A user profile contains name and password pairs that are used to access a computer, data source or application at run time, when anonymous access is not allowed.

1. From the **Start** menu, select, **Programs, Oracle**, and then select **Studio**. Oracle Studio opens.
2. From the Design perspective, Configuration view, expand the **Machines** folder, then expand the machine where you want to set the user name and password.
3. Expand **Users**.

- Right-click the NAV user profile and select **Edit User**. The NAV user profile editor is displayed as shown in the following figure:

Figure 2–5 The User Editor pane



- In the User editor, click **Add**. The Add Authenticator screen is displayed as shown in the following figure:

Figure 2–6 The Add Authenticator screen



- Select **Remote Machine** from the **Resource Type** list.
- Enter the name of the IBM z/OS computer defined in Oracle Studio.
- Enter the name and password used to access the computer and confirm the password.
- Click **OK**.

Modeling Interactions for OracleAS Adapter for IMS/DB

Modeling interactions for OracleAS Adapter for IMS/DB involves defining an Oracle Connect back-end adapter using Oracle Studio. All the definitions specified in Oracle Studio are written to the IBM z/OS platform.

This section contains the following:

- [Setting Up the IMS/DB Data Source](#)
- [Importing Metadata for the IMS/DB Data Source](#)
- [Setting Up an Oracle Connect Adapter](#)
- [Generating Outbound Interactions](#)
- [Modifying Existing Interactions](#)

Setting Up the IMS/DB Data Source

Oracle Connect requires you to specify the IMS/DB data source as the first step in setting up the adapter.

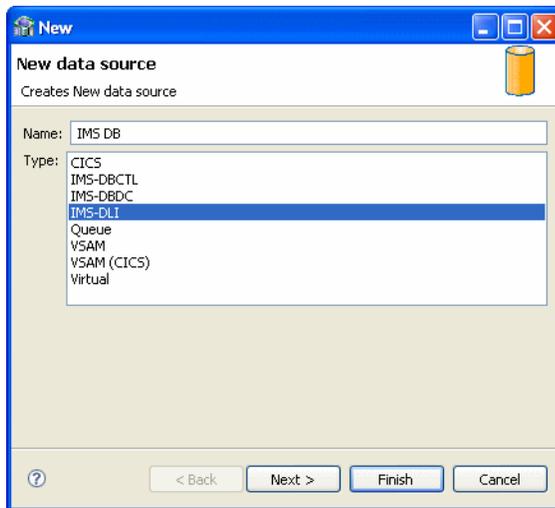
Do the following to set up the IMS/DB data source:

1. From the **Start** menu, select, **Programs, Oracle**, and then select **Studio**.
2. In the Design perspective, Configuration view, expand the machine folder.
3. In the Configuration Explorer, expand the node of the computer defined in "[Setting Up the IBM z/OS Platform in Oracle Studio](#)" on page 2-14.
4. Expand the **Bindings** folder. The binding configurations available on this computer are listed.
5. Expand the **NAV** binding. The NAV binding configuration includes folders for data sources and adapters that are located on the computer.
6. Right-click **Data sources** and select **New data source**, to open the New data source wizard.
7. In the **New** dialog box, enter a name for the IMS/DB data source. The name can contain letters and numbers and the underscore character only.
8. Select the data source type from the **Type** list, as follows:
 - If you are accessing IMS/DB data under CICS, then select **IMS-DBCTL**
 - If you are accessing IMS/DB data under IMS/TM, then select **IMS-DBDC**
 - If you are accessing IMS/DB data directly, then select **IMS-DLI**

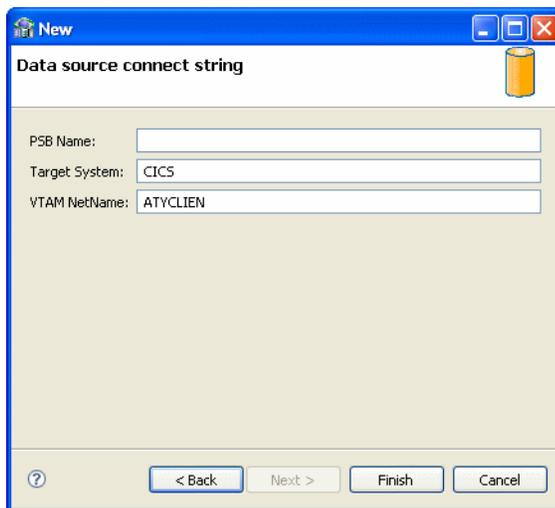
Note: Only use the IMS-DLI option to connect directly to the IMS/DB data in the following circumstances:

- The IMS/DB records are not managed by CICS or by IMS/TM.
 - The IMS/DB records are required for read-only purposes and changes to the data buffered by CICS or IMS/TM while reading the data, are not expected.
-

The New Data Source screen is shown in the following figure:

Figure 2–7 The New Data Source screen

9. Click **Next**. The Data Source Connect String screen for the selected data source type is displayed.
10. Enter the connect string for the selected data source, as follows:
If you select **IMS-DBCTL**, then the following screen is displayed:

Figure 2–8 The Data Source Connect String screen (for IMS-DBCTL)

Where:

- **PSB Name:** Specify the name of the PSB file that contains details of all the IMS/DB databases that you want to access.
- **Target System:** Specify the VTAM APPLID of the CICS target system. The default value is CICS. This parameter is used when updating IMS/DB data. You can determine this value by activating the CEMT transaction on the target CICS system. The legend `APPLID=target_system` appears in the bottom right corner of the screen.

- VTAM NetName:** The VTAM netname of the specific connection being used by EXCI (and MRO) to relay the program call to the CICS target system. For example, if you issue the following command to CEMT:

```
CEMT INQ CONN
```

On the display screen that the netname is BATCHCLI (this is the default connection supplied by IBM upon the installation of CICS). The default value is ATYCLIEN.

If you select IMS-DBDC, then the following screen is displayed:

Figure 2–9 The Data Source Connect String screen (for IMS/TM)

Where:

- XCF group:** The Cross System Coupling Facility collection of XFC members the connection belongs to. A group may consist of up to eight characters, and may span between multiple systems.
- XCF member:** The Cross System Coupling Facility group member.
- Tpipe prefix:** The transaction pipe prefix used to associate between the transaction and the transaction pipe it is using. The default value is ATTU.
- User name:** The security facility user identification.
- Group name:** The security facility group identification.
- imsTrans name:** The name of the IMS transaction that points to the program that is used to access the PSB used to access the IMS/DB data. The default name of the transaction is ATYIMSTM.

If you select **IMS-DLI**, then no connection information is required.

- Click **Finish**. The new data source is displayed in the Configuration Explorer.

Configuring the Data Source Driver

After setting up the data source, you can set its driver properties according to specific requirements, as follows:

- Right-click the required data source in the Configuration Explorer and select **Edit Data source**.

2. Click the Properties tab.

For IMS/DB under CICS, the following configuration properties are available:

- `cicsProgname`: This parameter specifies the ATYDBCTL program that is supplied with Oracle Connect to enable updating the IMS data source. To use the ATYDBCTL program, copy the program from `NAVROOT.LOAD` to a CICS DFHRPL library (such as `CICS.USER.LOAD`) and then define the ATYDBCTL program under CICS using any available group such as ATY group:

`NAVROOT` is the high-level qualifier where Oracle Connect is installed.

After defining the ATYDBCTL program to a group, install it as follows:

```
CEDA IN G(ATY)
```

- `cicsTraceQueue`: This parameter specifies the e name of queue for output which is defined under CICS when tracing the output of the ATYDBCTL program. When not defined, the default CICS queue is used.
- `disableExplicitSelect=true|false`: When set to `true`, this parameter disables the `explicitSelect ADD` attribute; every field is returned by a `SELECT * FROM...` statement.
- `exciTransid`: This parameter specifies the CICS TRANSID. This value must be EXCI or a copy of this transaction.
- `pbsName=string`: The PSB Name in the connect string, this parameter contains details of all the IMS/DB databases that you want to access.
- `targetSystemApplid`: The Target System in the connect string, this parameter specifies the VTAM applid of the CICS target system. The default value is CICS. This parameter is used when updating VSAM data. You can determine this value by activating the CEMT transaction on the target CICS system. The legend `APPLID=target_system` appears in the bottom right corner of the screen.
- `vtamNetname`: The VTAM NetName in the connect string, this parameter specifies the connection being used by EXCI (and MRO) to relay the program call to the CICS target system. The default value is `ATYCLIEN`.

For IMS/DB under IMS/TM, the following configuration properties are available:

- `disableExplicitSelect`: When set to `true`, this parameter disables the `explicitSelect ADD` attribute; every field is returned by a `SELECT * FROM...` statement.
- `imsTransname`: This parameter specifies the name of the IMS transaction that points to the program that is used to access the PSB used to access the IMS/DB data. The default name of the transaction is `ATYIMSTM`.
- `maxSessions`: This parameter specifies the maximum number of sessions allowed. The default value is 5.
- `racfGroupId`: This parameter specifies the security facility group identification (for example, the RACF group identification).
- `racfUserId`: This parameter specifies the security resource user name.
- `tpipePrefix`: The TPIPE prefix in the connect string, this parameter is used to associate between the transaction and the transaction pipe it is using. The default is `ATTU`.
- `xcfClient`: This parameter specifies the client name for the Cross System Coupling Facility to which the connection belongs.

- `xcfGroup`: The XCF group in the connect string, this parameter specifies the Cross System Coupling Facility collection of XCF members the connection belongs to. A group may consist of up to eight characters, and may span between multiple systems.
- `xcflmsMember`: This parameter specifies the Cross System Coupling Facility group member.
- `xcfServer`: The XCF server in the connect string, this parameter specifies the Cross System Coupling Facility group member.

For IMS/DB direct, the following configuration property is available:

- `disableExplicitSelect`: When set to `true`, this parameter disables the `explicitSelect ADD` attribute; every field is returned by a `SELECT * FROM . . .` statement.

3. Click **Save** to save the changes you made to the configuration properties.

Configuring the Data Source Driver Advanced Properties

You configure the advanced properties for a data source in the **Advanced** tab of the data source editor. The advanced settings are the same for every data source.

Advanced settings let you do the following:

- Define the transaction type
- Edit the syntax name
- Provide a table owner
- Determine if a data source is updateable or readable
- Provide repository information
- Set the virtual view policy

Use the following procedure to configure the data source advanced features.

1. Open Oracle Studio.
2. In the Design Perspective Configuration View, expand the **Machine** folder and then expand the machine where you want to configure the data source.
3. Expand the **Data sources** folder, right click the data source you are configuring, then select **Open**.
4. Click the **Advanced** tab and make the changes that you want. The table below describes the available fields:

Table 2–12 Data Source Advanced Configuration

Field	Description
Properties	
Transaction type	The transaction level (0PC, 1PC or 2PC) that is applied to this data source, no matter what level the data source supports. The default is the data source's default level.

Table 2–12 (Cont.) Data Source Advanced Configuration

Field	Description
Syntax name	<p>A section name in the NAV.SYN file that describes SQL syntax variations. The default syntax file contains the following predefined sections:</p> <ul style="list-style-type: none"> ■ OLESQL driver and the SQL Server 7 OLE DB provider (SQLOLEDB): syntaxName="OLESQL_SQLOLEDB" ■ OLESQL driver and JOLT: syntaxName="OLESQL_JOLT" ■ Rdb driver and Rdb version: syntaxName="RDBS_SYNTAX" ■ ODBC driver and EXCEL data: syntaxName="excel_data" ■ ODBC driver and SQL/MX data: syntaxName="SQLMX_SYNTAX" ■ ODBC driver and SYBASE SQL AnyWhere data: syntaxName="SQLANYS_SYNTAX" ■ Oracle driver and Oracle case sensitive data: syntaxName="ORACLE8_SYNTAX" or, syntaxName="ORACLE_SYNTAX" <p>For case sensitive table and column names in Oracle, use quotes (") to delimit the names. Specify the case sensitivity precisely.</p>
Default table owner	The name of the table owner that is used if an owner is not indicated in the SQL
Read/Write information	<p>Select one of the following:</p> <ul style="list-style-type: none"> ■ Updateable data: Select this if you want to be able to update the data on the data source. ■ Read only data: Select this to allow users to only view the data on the data source.
Repository Directory	
Repository directory	Enter the location for the data source repository.
Repository name	Enter the name of a repository for a data source. The name is defined as a data source in the binding configuration. It is defined as the type <code>Virtual</code> and is used to store Oracle Connect views and stored procedures for the data source, if required instead of using the default SYS data.
Virtual View Policy	
Generate sequential view	Select this to map a non-relation file to a single table. This parameter is valid only if you are using virtual array views.
Generate virtual views	Select this if you want to have an individual table created for every array in the non-relational file. This parameter is valid only if you are using virtual array views.
Include row number column	Select this to include a column that specifies the row number in the virtual or sequential view. This parameter is valid only if you are using virtual array views.

Table 2–12 (Cont.) Data Source Advanced Configuration

Field	Description
All parent columns	Select this for virtual views to include all the columns in the parent record. This parameter is valid only if you are using virtual array views.

Importing Metadata for the IMS/DB Data Source

Oracle Connect requires metadata describing the IMS/DB data source records and the fields in these records. Use the Import Metadata procedure in Oracle Studio Design perspective to import metadata for the IMS/DB data source from DBD, COBOL copybooks and PSB files, which describe the data.

The following information is needed during the import procedure:

- DBD files: These files are copied to the computer running Oracle Studio as part of the import procedure.
- COBOL copybooks: These copybooks are copied to the computer running Oracle Studio as part of the import procedure.
- PSB file: This file is copied to the computer running Oracle Studio as part of the import procedure.

The metadata import procedure is has the following steps:

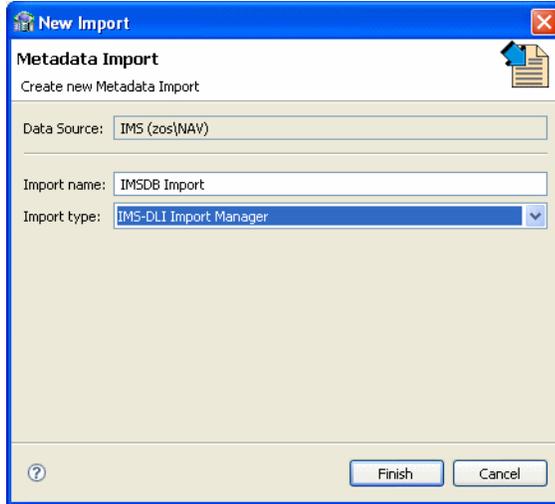
- [Selecting the Input Files](#)
- [Applying Filters](#)
- [Selecting Tables](#)
- [Matching DBD to COBOL](#)
- [Import Manipulation](#)
- [Metadata Model Selection](#)
- [Import the Metadata](#)

Selecting the Input Files

1. From the **Start** menu, select, **Programs, Oracle**, and then select **Studio**.
2. In the Configuration view, expand the computer defined in "[Setting Up the IBM z/OS Platform in Oracle Studio](#)".
3. Expand **Bindings**. The binding configurations available on this computer are listed.
4. Expand NAV binding.
5. Expand **Data sources**.
6. Right-click the IMS/DB data source defined in [Setting Up the IMS/DB Data Source](#).
7. Select **Show in Metadata View**, to open the Metadata tab, with the IMS/DB data source displayed under the data sources list.
8. Right-click the IMS/DB data source and select **New Import**.
The New Import screen is displayed.
9. Enter a name for the import. The name can contain letters and numbers and the underscore character only.

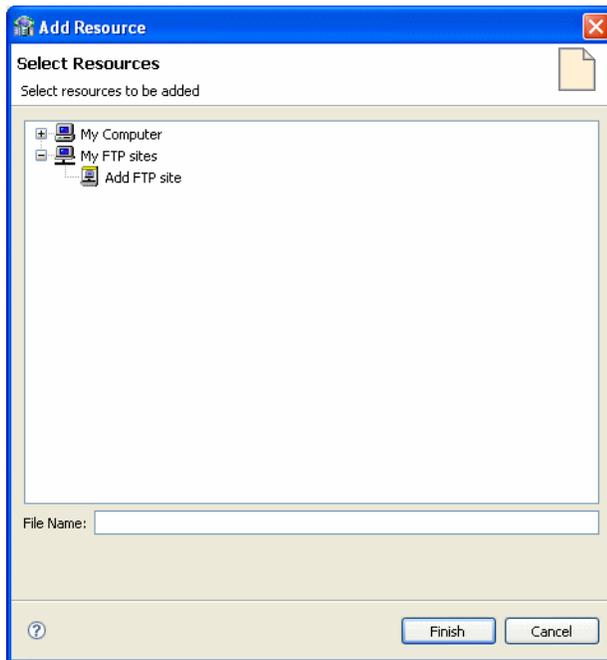
10. From the **Import Type** list select, there should be only one choice in the list, which depends on the type of IMS data source that you selected. The New Import wizard is shown in the following figure:

Figure 2–10 The Metadata Import dialog box



11. Click **Finish**. The Metadata Import wizard opens.
12. Click **Add** in the Import Wizard to add DBD files. The Add Resource screen is displayed, providing the option of selecting files from the local machine or copying the files from another machine.

Figure 2–11 The Select Resources screen



13. Click **Add**.
The Select Resources screen is displayed, which provides the option to select files from the local computer or copy the files from another computer.

14. If the files are on another computer, right-click **My FTP Sites** and select **Add**. Optionally, double-click **Add FTP site**. The Add FTP Site screen is displayed.
15. Set the FTP data connection by entering the server name where the DBD files reside and, if not using anonymous access, enter a valid username and password to access the machine.
16. To browse and transfer files required to generate the metadata, access the machine using the username as the high-level qualifier.

After accessing the machine, you can change the high-level qualifier by right-clicking the machine and selecting **Change Root Directory**.

17. Select the files to import and click **Finish** to start the transfer.
18. Repeat the procedure for COBOL copybooks.

The format of the COBOL copybooks must be the same. For example, you cannot import a COBOL copybook that uses the first six columns together with a COBOL copybook that ignores the first six columns. In this type of case, repeat the import process.

You can import the metadata from one COBOL copybook and later add to this metadata by repeating the import using different COBOL copybooks.

19. Click **Add** in the Import wizard to add a PSB file, if necessary.

The selected files are displayed in the Get Input Files screen, as shown in the figure below.

Figure 2–12 *Get Input Files Screen*

20. Click **Next** to go to the [Applying Filters](#) step.

Applying Filters

This section describes the steps required to apply filters on the COBOL Copybook files used to generate the Metadata. It continues the [Selecting the Input Files](#) step.

- Ignore first 6 columns: Ignore the first six columns in the COBOL copybooks.
- Ignore labels: Ignore labels in the DBD files.

The following PSB filters are available:

- Ignore after column 72: Ignore columns 73 to 80 in the COBOL copybooks.
- Ignore first 6 columns: Ignore the first six columns in the COBOL copybooks.

2. Click **Next** to go to the [Selecting Tables](#) step.

Selecting Tables

This section describes the steps required to select the tables from the COBOL Copybooks.

The following procedure continues the [Applying Filters](#) step. Perform these steps to select the tables.

1. From the Select Tables screen, select the tables that you want to access. To select all tables, click **Select All**. To clear all the selected tables, click **Unselect All**.

The Select Tables screen is shown in the following figure:

Figure 2–14 Select Tables Screen

The screenshot shows a window titled "Select Tables" with a sub-header "Step 3 of 7". Below the title is the instruction "Select tables to import:". A table with two columns, "Source and Table Name" and "Parent", is displayed. The "Source and Table Name" column contains a tree view with "hospital.dbd" expanded, showing several sub-items, each with a checked checkbox. The "Parent" column lists the parent table for each segment. At the bottom of the table are two buttons: "Select All" and "Unselect All". Below the table area are three navigation buttons: "<< Back", "Next >>", and "Finish".

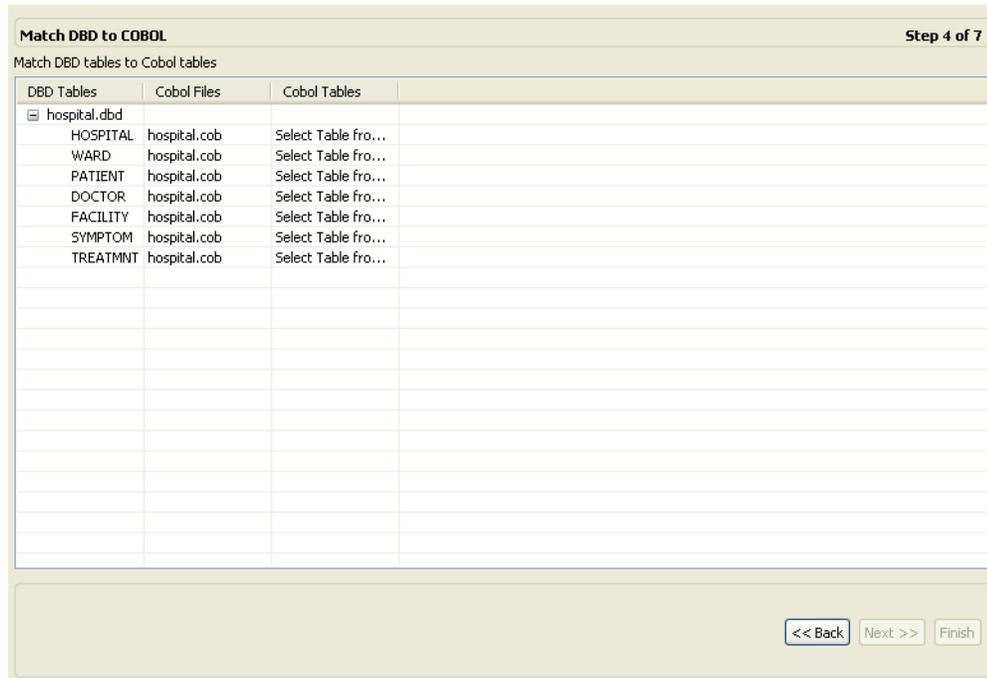
Source and Table Name	Parent
<input checked="" type="checkbox"/> hospital.dbd	
<input checked="" type="checkbox"/> DOCTOR	PATIENT
<input checked="" type="checkbox"/> FACILITY	HOSPITAL
<input checked="" type="checkbox"/> HOSPITAL	0
<input checked="" type="checkbox"/> PATIENT	WARD
<input checked="" type="checkbox"/> SYMPTOM	PATIENT
<input checked="" type="checkbox"/> TREATMINT	PATIENT
<input checked="" type="checkbox"/> WARD	HOSPITAL

The import manager identifies the names of the segments in the DBD files that will be imported as tables.

2. Click **Next** (the Import Manipulation screen opens) to continue to the [Matching DBD to COBOL](#) step.

Matching DBD to COBOL

This step lets you match the DBD file to your COBOL copybook. It is a continuation of the [Selecting Tables](#) step. The following figure shows the DBD to COBOL step that is displayed in the Editor.

Figure 2–15 Match DBD to COBOL Screen

1. Match each table selected from the DBD file with the COBOL copybook that contains the relevant table structure. Select the files and tables from the dropdown lists for each DBD entry.
2. Click **Next** (the Import Manipulation screen opens) to continue to the [Import Manipulation](#) step.

Import Manipulation

This section describes the operations available for manipulating the imported records (tables). It continues the [Matching DBD to COBOL](#) step.

The import manager identifies the names of the records in the DDM Declaration files that will be imported as tables. You can manipulate the general table data in the [Import Manipulation Screen](#).

Perform the following steps to manipulate the table metadata.

1. From the Import Manipulation screen (see [Import Manipulation Screen](#) figure), right-click the table record marked with a validation error, and select the relevant operation. See the table, [Table Manipulation Options](#) for the available operations.
2. Repeat step 1 for all table records marked with a validation error. You resolve the issues in the [Import Manipulation Screen](#).

Once all the validation error issues have been resolved, the Import Manipulation screen is displayed with no error indicators.

3. Click **Next** to continue to the [Metadata Model Selection](#).

Import Manipulation Screen

The Import Manipulation screen is shown in the following figure:

- Setting column-wise normalization for fields with dimensions (arrays). You can create new fields instead of the array field where the number of generated fields will be determined by the array dimension.
- Creating arrays and setting the array dimension.

The following table lists and describes the available operations when you right-click a table entry:

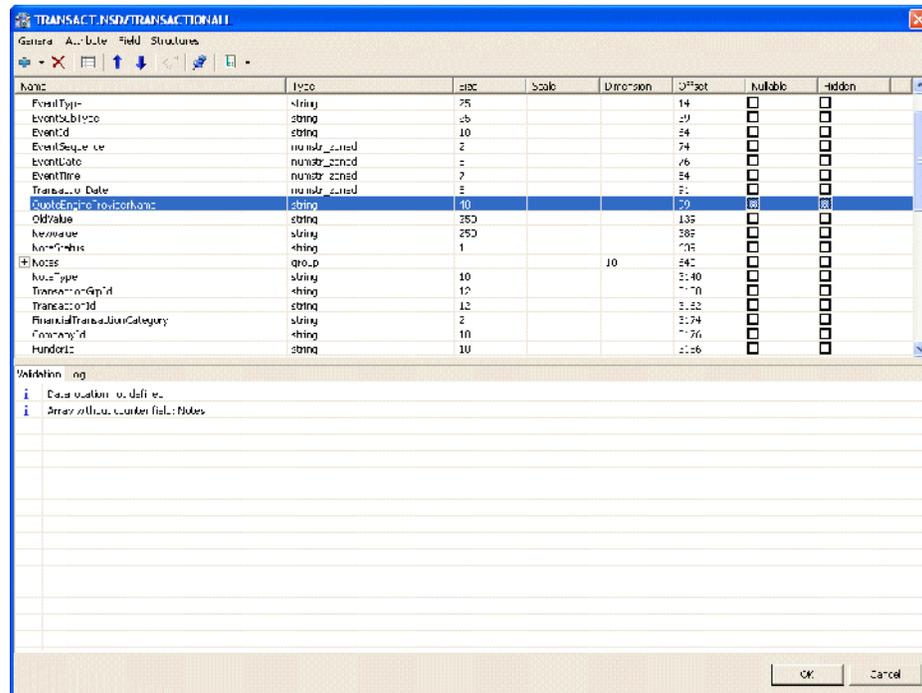
Table 2–13 Table Manipulation Options

Option	Description
Fields Manipulation	Customizes the field definitions, using the Field Manipulation screen. You can also access this screen by double-clicking the required table record.
Rename	Renames a table. This option is used especially when more than one table with the same name is generated from the COBOL.
Set data location	Sets the physical location of the data file for the table.
Set table attributes	Sets the table attributes.
XSL manipulation	Specifies an XSL transformation or JDOM document that is used to transform the table definitions.
Remove	Removes the table record.

You can manipulate the data in the table fields in the [Field Manipulation Screen](#). Double-click a line in the Import Manipulation Screen to open the Field Manipulation Screen.

Field Manipulation Screen

The Field Manipulation screen lets you make changes to fields in a selected table. You get to the Field Manipulation screen through the [Import Manipulation Screen](#). The Field Manipulation screen is shown in the following figure.

Figure 2–17 Field Manipulation Screen

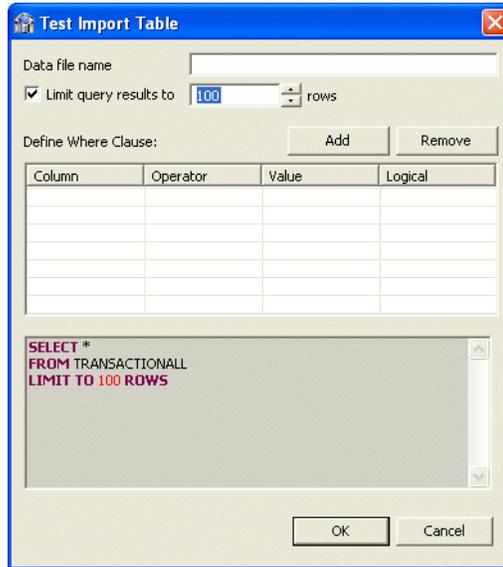
You can carry out all of the available tasks in this screen through the menu or toolbar. You can also right click anywhere in the screen and select any of the options available in the main menus from a shortcut menu. The following table describes the tasks that are done in this screen. If a toolbar button is available for a task, it is pictured in the table.

Table 2–14 Field Manipulation Screen Commands

Command	Description
General menu	
Undo	Click to undo the last change made in the Field Manipulation screen.
	
Select fixed offset	The offset of a field is usually calculated dynamically by the server at runtime according the offset and size of the proceeding column. Select this option to override this calculation and specify a fixed offset at design time. This can happen if there is a part of the buffer that you want to skip.
	
	When you select a fixed offset you pin the offset for that column. The indicated value is used at runtime for the column instead of a calculated value. Note that the offset of following columns that do not have a fixed offset are calculated from this fixed position.

Table 2–14 (Cont.) Field Manipulation Screen Commands

Command	Description
Test import tables 	Select this table to create an SQL statement to test the import table. You can base the statement on the Full table or Selected columns . When you select this option, the following screen opens with an SQL statement based on the table or column entered at the bottom of the screen.



Enter the following in this screen:

- Data file name:** Enter the name of the file that contains the data you want to query.
- Limit query results:** Select this if you want to limit the results to a specified number of rows. Enter the amount of rows you want returned in the following field. 100 is the default value.
- Define Where Clause:** Click **Add** to select a column to use in a Where clause. In the table below, you can add the operator, value and other information. Click on the columns to make the selections. To remove a Where Clause, select the row with the Where Clause you want to remove and then click **Remove**.

The resulting SQL statement with any Where Clauses that you added are displayed at the bottom of the screen.

Click **OK** to send the query and test the table.

Attribute menu

Change data type	Select Change data type from the Attribute menu to activate the Type column, or click on the Type column and select a new data type from the drop-down list.
------------------	--

Table 2–14 (Cont.) Field Manipulation Screen Commands

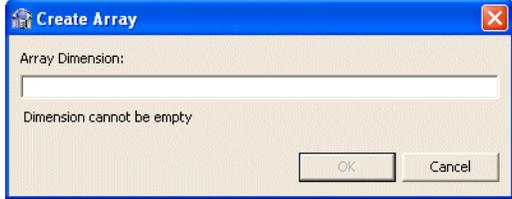
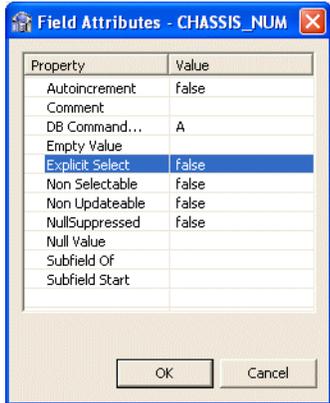
Command	Description
Create array	This command allows you to add an array dimension to the field. Select this command to open the Create Array screen.
	
	Enter a number in the Array Dimension field and click OK to create the array for the column.
Hide/Reveal field	Select a row from the Field manipulation screen and select Hide field to hide the selected field from that row. If the field is hidden, you can select Reveal field .
Set dimension	Select this to change or set a dimension for a field that has an array. Select Set dimension to open the Set Dimension screen.
	Edit the entry in the Array Dimension field and click OK to set the dimension for the selected array.
Set field attribute	Select a row to set or edit the attributes for the field in the row. Select Set field attribute to open the Field Attribute screen.
	 
	Click in the Value column for any of the properties listed and enter a new value or select a value from a drop-down list.
Nullable/Not nullable	Select Nullable to activate the Nullable column in the Field Manipulation screen. You can also click in the column.
	Select the check box to make the field Nullable. Clear the check box to make the field Not Nullable.
Set scale	Select this to activate the Scale column or click in the column and enter the number of places to display after the decimal point in a data type.
Set size	Select this to activate the Size column or click in the column and enter the number of total number of characters for a data type.
Field menu	

Table 2–14 (Cont.) Field Manipulation Screen Commands

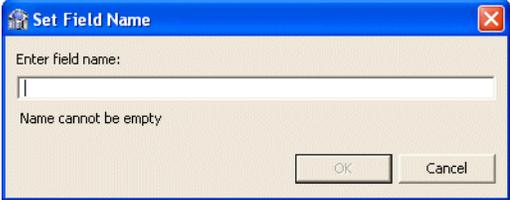
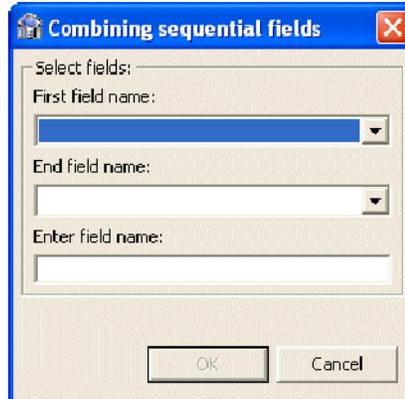
Command	Description
Add 	Select this command or use the button to add a field to the table. If you select a row with a field (not a child of a field), you can add a child to that field. Select Add Field or Add Child to open the following screen: 
Delete field 	Select a row and then select Delete Field or click the Delete Field button to delete the field in the selected row.
Move up or down 	Select a row and use the arrows to move it up or down in the list.
Rename field	Select Rename field to make the Name field active. Change the name and then click outside of the field.
Sturctures menu	
Columnwise Normalization	Select Columnwise Normalization to create new fields instead of the array field where the number of generated fields will be determined by the array dimension.

Table 2–14 (Cont.) Field Manipulation Screen Commands

Command	Description
Combining sequential fields	Select Combining sequential fields to combine two or more sequential fields into one simple field. The following dialog box opens:

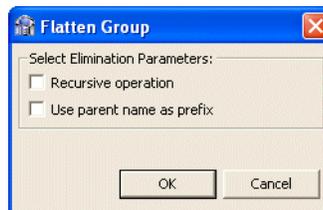


Enter the following information in the Combining sequential fields screen:

- **First field name:** Select the first field in the table to include in the combined field
- **End field name:** Select the last field to be included in the combined field. Make sure that the fields are sequential.
- **Enter field name:** Enter a name for the new combined field.

Flatten group

Select **Flatten Group** to flatten a field that is an array. This field must be defined as *Group* for its data type. When you flatten an array field, the entries in the array are spread into a new table, with each entry in its own field. The following screen provides options for flattening.

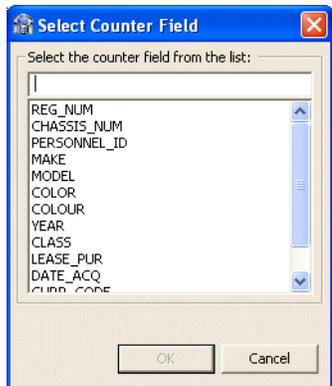
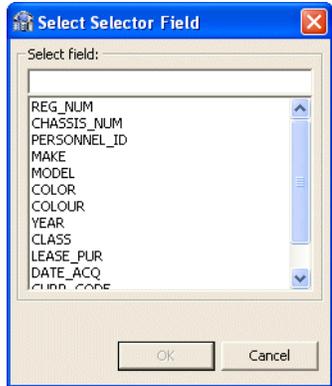


Do the following in this screen:

- Select **Recursive operation** to repeat the flattening process on all levels. For example, if there are multiple child fields in this group, you can place the values for each field into the new table when you select this option.
- Select **Use parent name as prefix** to use the name of the parent field as a prefix when creating the new fields. For example, if the parent field is called *Car Details* and you have a child in the array called *Color*, when a new field is created in the flattening operation it will be called *Car Details_Color*.

Table 2–14 (Cont.) Field Manipulation Screen Commands

Command	Description
Mark selector	Select Mark selector to select the selector field for a variant. This is available only for variant data types. Select the Selector field form the following screen.
Replace variant	Select Replace variant to replace a variant’s selector field.
Select counter field	Select Counter Field opens a screen where you select a field that is the counter for an array dimension.



Metadata Model Selection

This section lets you generate virtual and sequential views for imported tables containing arrays. In addition, you can configure the properties of the generated views. It continues the [Import Manipulation](#) procedure. This allows you to flatten tables that contain arrays.

In the Metadata Model Selection step, you can select configure values that apply to all tables in the import or set specific settings for each table. The following describes how to configurations available in the [The Metadata Model Selection editor](#).

- Select *one* of the following:
 - **Default values for all tables:** Select this if you want to configure the same values for all the tables in the import. Make the following selections when using this option:
 - **Generate sequential view:** Select this to map non-relational files to a single table.
 - **Generate virtual views:** Select this to have individual tables created for each array in the non-relational file.

- **Include row number column:** Select *one* of the following:

`true`: Select `true`, to include a column that specifies the row number in the virtual or sequential view. This is true for this table only, even in the the data source is not configured to include the row number column.

`false`: Select `false`, to not include a column that specifies the row number in the virtual or sequential view for this table even if the data source is configured to include the row number column.

`default`: Select `default` to use the default data source behavior for this parameter.

For information on how to configure these parameters for the data source, see [Configuring the Data Source Driver Advanced Properties](#).

- **Inherit all parent columns:** Select *one* of the following:

`true`: Select `true`, for virtual views to include all the columns in the parent record. This is true for this table only, even in the data source is not configured to include all of the parent record columns.

`false`: Select `false`, so virtual views do not include the columns in the parent record for this table even if the data source is configured to include all of the parent record columns.

`default`: Select `default` to use the default data source behavior for this parameter.

For information on how to configure these parameters for the data source, see [Configuring the Data Source Driver Advanced Properties](#).

- **Specific virtual array view settings per table:** Select this to set different values for each table in the import. This will override the data source default for that table. Make the selections in the table under this selection. See the item above for an explanation.

When you are finished, click Next to go to the [Import the Metadata](#) step.

The Metadata Model Selection editor is shown in the following figure:

Figure 2–18 The Metadata Model Selection editor

The screenshot shows the 'Metadata Model Selection' dialog box, labeled 'Step 6 of 7'. It contains two main sections:

- Default values for all tables:**
 - Sequential View
 - Virtual Views
 - Virtual views include row number: (dropdown)
 - Virtual views inherit all parent columns: (dropdown)
- Specific virtual array view settings per table:**
 - A table with the following columns: Table Name, Sequential View, Virtual Views, Row Number C..., Inherit all Pare...
 - The table is currently empty.

At the bottom right, there are three buttons: '<< Back', 'Next >>', and 'Finish'.

Import the Metadata

This section describes the steps required to import the metadata to the target computer. It continues the [Metadata Model Selection](#) step.

You can now import the metadata to the computer where the data source is located, or import it later (in case the target computer is not available).

Perform the following steps to transfer the metadata.

1. Select **Yes** to immediately transfer the metadata from the Windows computer to the z/OS platform, or **No** to transfer the metadata later.

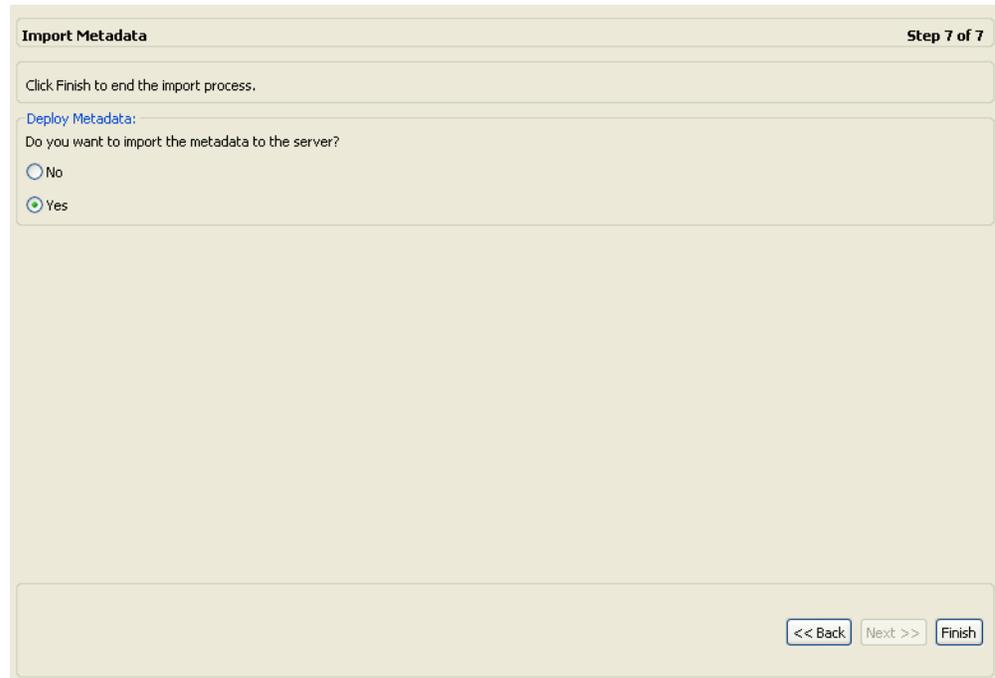
The metadata is imported based on the options selected in the previous steps and it is stored on the IBM z/OS platform computer. An XML representation of the metadata is generated. This XML file can be viewed by expanding the Output node.

2. Click **Finish**.

After performing the import, you can view the metadata in the Metadata tab in Oracle Studio Design perspective. You can also make any fine adjustments to the metadata and maintain it, as necessary.

See Also: [Metadata for the IMS/DB Data Source](#) for details about the data source metadata.

The Import Metadata screen is shown in the following figure:

Figure 2–19 The Import Metadata screen

After performing the import, you can view the metadata in the Metadata tab in Oracle Studio. You can also make any fine adjustments to the metadata and maintain it, as necessary.

Setting Up an Oracle Connect Adapter

To work with the Oracle Connect against the IMS/DB data source from Oracle Application Server, you need to set up an adapter definition on the IBM z/OS platform to handle the interactions to and from the IMS/DB data.

Perform the following steps to setup the adapter:

1. From the **Start** menu, select, **Programs, Oracle**, and then select **Studio**.
2. From the Design perspective, Configuration view expand the **Machines** folder.
3. In the Configuration view, expand the computer defined in "[Setting Up the IBM z/OS Platform in Oracle Studio](#)" on page 2-14.
4. Expand the **Bindings** folder.
5. Expand the **NAV** binding.
6. Right-click **Adapters** and select **New Adapter** to open the New Adapter wizard.
7. Enter a name for the back-end adapter.

Note: The word *event* is a reserved word and cannot be used when naming an adapter.

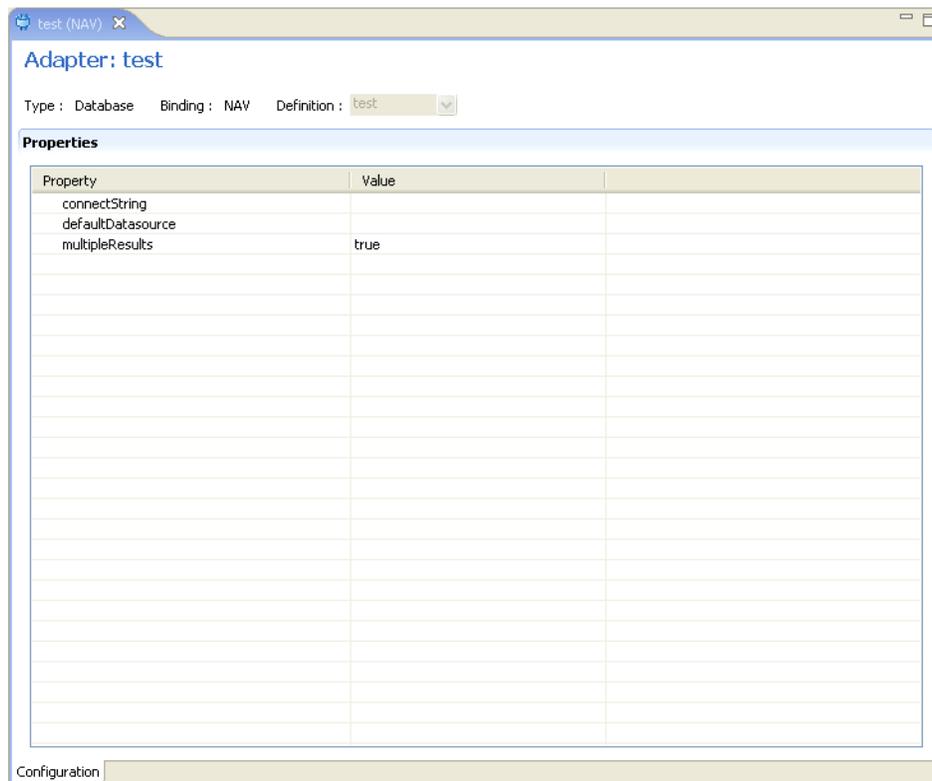
8. Select **Database** as the back-end adapter type from the **Type** list. The Database adapter enables accessing the IMS/DB data source from Oracle Application Server.

9. Select **Events**.
10. Click **Finish**. The back-end adapter is added to the Configuration view and the Configuration properties open in the Editor.

Note: Other adapters that are displayed in the **Type** list are not supported with the version of Oracle Connect installed at the site.

11. You can change any of the properties for the adapter, as required.
The **Properties** tab is shown in the following figure:

Figure 2–20 The Properties tab



The following properties are available:

Table 2–15 Adapter Properties

Property	Description
ConnectString	Leave this value blank.
DefaultDatasource	The name of the data source defined in Oracle Studio that you want to access with the Database adapter. For example, Legacy.
multipleResults	Leave this value as true.

Generating Outbound Interactions

Oracle Connect requires metadata describing the adapter interactions, including the structures used to pass information to and from the adapter.

Use the Metadata Import wizard in Oracle Studio to generate interaction metadata, as follows:

1. From the **Start** menu, select, **Programs, Oracle**, and then select **Studio**.
2. In the Design perspective, Configuration view expand the **Machines** folder.
3. In the Configuration view, expand the computer defined in "[Setting Up the IBM z/OS Platform in Oracle Studio](#)" on page 2-14.
4. Expand the **Bindings** folder. The binding configurations available on this computer are listed.
5. Expand the **NAV** binding.
6. Expand the **Adapters** folder.
7. Right-click the Database back-end adapter defined in "[Setting Up an Oracle Connect Adapter](#)" on page 2-41.
8. Select **Show Metadata View** to open the **Metadata** tab, with the database back-end adapter displayed under the **Adapters** list.
9. Right-click **Interactions** and select **New** to open the New Interaction wizard. The wizard opens with the following options displayed:
 - **Automatic:** Four interactions are generated for each IMS/DB table, enabling to execute the `SELECT`, `INSERT`, `UPDATE`, `DELETE` command.
 - **Manual:** One interaction is generated, based on the type of SQL selected such as database query (a `SELECT` statement) or Database Modification (an `INSERT`, `UPDATE`, or `DELETE` statement).

Note: IMS/DB does not support the stored procedure option.

10. Select how you want to generate interactions (Automatic or Manual).

If you select Automatic generation, perform the following steps:

- a. Click **Next**. The Select Tables screen opens, enabling you to add tables from the IMS/DB data source that you want to access with the interaction.
- b. Click **Add** to include tables.

The data sources that have been defined and all the tables, for each data source, that have had metadata defined for them are displayed.

Select the tables that you want to access with the interaction and click the right-pointing arrow to move these tables to the right-hand pane.

- c. Click **Finish**. The selected tables are displayed.
- d. Click **Finish**. Four interactions are generated for each table selected (`SELECT`, `INSERT`, `UPDATE`, `DELETE`), together with the record structures to support the interactions and the responses from the IMS/DB data source.
- e. Click **Yes** to complete the task. The interactions and the record structures that relate to the interactions are displayed in the Metadata tab.

If you select Manual generation, perform the following steps:

- a. Select the type of SQL (query or modification) for the interaction and click **Next**. The Interaction Name screen is displayed.
- b. Enter a name for the interaction, and select **Create new query**.

Note: The option to use a previously saved query is not applicable.

- c. Click **Next**. The Define Interaction screen is displayed enabling you to build the query.

Note: If the database query option was selected in step a, then the Define Interaction screen is displayed, enabling you to build a SELECT statement only, as indicated in the Query type field. If the database modification option was selected, then this field enables you to select the required SQL modification statement from a list (INSERT, UPDATE, or DELETE).

- d. Click **Next**. The Interaction Properties screen is displayed, enabling you to define the interaction parameters. You can set the following interaction parameters:

Table 2–16 Interaction Definition Parameters

Parameter	Description
passThrough	Defines whether the query is passed directly to the back-end database for processing or processed by the Query Processor.
Reuse compiled query	Defines whether the query is saved in cache for reuse.
Encoding	Sets the encoding method used to return binary data in text format. You can select between the base 64 and the hexadecimal encoding methods.
Event	Defines whether the interaction mode is sync-send or sync-receive.
Fail on no rows return	Defines whether an error is returned in case no data is returned
Root element	Defines the root element name for records returned by the query, using the <root> \ <record> format.
Record element	Defines the record element name for records returned by the query, using the <root> \ <record> format.
Max. records	Sets the maximum number of record returned by the query.
Null string	Sets the string returned in place of a null value. If not specified, the column is skipped.

- e. Click **Next**. The Interaction Parameters screen is displayed, where you specify input parameters for the interaction. The following parameters are specified:

Table 2–17 Interaction Parameters

Parameter	Description
Name	The name of the parameter.
Type	The type of parameter (such as string, number, binary).

Table 2–17 (Cont.) Interaction Parameters

Parameter	Description
Nullable	The nullable value (true or false).
Default	The default value for the parameter.
Context Field	This field is not applicable.
Bind to Sqls	This field is not applicable.

- f. Click **Finish** to generate the interaction, including the record schema required to support the interaction input and output.

See Also: ["Adapter Metadata"](#) on page A-13 for details about the data source metadata.

Modifying Existing Interactions

You can modify the interaction definitions to the exact requirements of the application, in the Design perspective **Metadata** tab.

The following example uses the DELETE interaction, generated in the previous task, to describe how the interactions can be modified:

Note: The interaction modification procedure is the same for all types of SQL statements (INSERT and UPDATE) as described, using a DELETE SQL statement.

1. In the Metadata tab, right-click the interaction to modify and select **Open**.

The adapter metadata editor opens, displaying the **General** tab.

The **General** tab displays general information about the way the interaction is executed. You can add a description of the interaction and define the mode of operation for the interaction. The following modes are available:

- sync-send-receive: The interaction sends a request and expects to receive a response.
- sync-send: The interaction sends a request and does not expect to receive a response.
- sync-receive: The interaction expects to receive a response.

The information for a request is passed in the input record. The information for the response from the IMS/DB data source is passed in the output record.

For more information, see ["Adapter Metadata General Properties"](#).

2. Click the **Advanced** tab to display specific information about the interaction.

As required, change the SQL and the parameters associated with the SQL.

Parameters are specified in a SET clause or in a WHERE clause with the following format:

```
:parameter_name
```

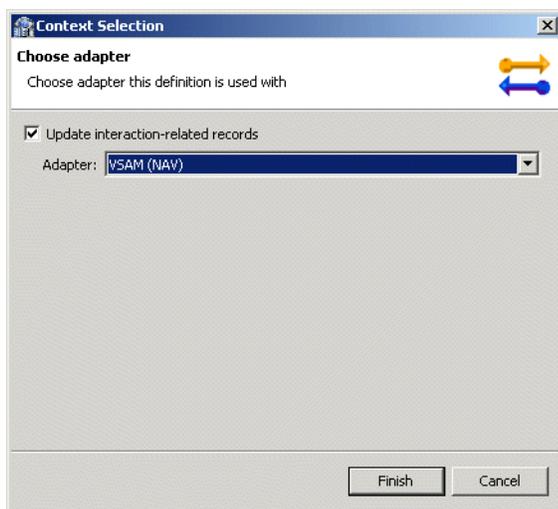
For more information, see ["Interaction Advanced Tab"](#)

- Depending on the changes made to the SQL, when you close the editor, or when clicking **Save**, the Context Selection screen is displayed.

Select the required adapter from the **Adapters** list and select **Update interaction-related records**. Any changes that need making to the record structures in the schema part of the metadata are done automatically.

The Context Selection screen is shown in the following figure:

Figure 2–21 The Context Selection screen



Note: The interaction records are built based on all the fields in the table and cannot be changed manually, even if you change the SQL so that less fields are involved.

- Click **Finish** to implement the modifications made to the interaction definitions.

Integrating OracleAS Adapter for IMS/DB with OC4J

To deploy and integrate OracleAS Adapter for IMS/DB with Oracle Application Server Containers for J2EE (OC4J), you need to configure the J2CA 1.5 IMS/DB adapter.

This section includes the following topics:

- [Integrating OracleAS Adapter for IMS/DB with OC4J](#)
- [Configuring the J2CA 1.5 IMS/DB Adapter](#)
- [Using the CCI API to Develop Applications](#)
- [Configuring Multiple Adapters](#)
- [Updating Configuration Information](#)

Integrating OracleAS Adapter for IMS/DB with OC4J

Oracle Application Server provides a complete Java 2 Enterprise Edition (J2EE) environment that executes on the Java Virtual Machine (JVM) of the standard Java Development Kit (JDK). OC4J is J2EE certified and provides all the J2EE specific containers, APIs, and services. OC4J supports the J2CA 1.5 standard.

J2CA defines standard Java interfaces for simplifying the integration of applications with the EIS. The Oracle adapters are deployed as a resource adapter within the OC4J container.

The contract between the OC4J client application and the resource adapter is defined by the common client interface (CCI). The contract between the OC4J container and the resource adapter is defined by the service provider interface (SPI). The SPI API addresses the connection management, transaction management and the security management.

Connection management enables application components to connect to an EIS and leverage any connection pooling provided by the application server.

Transaction management enables an application server to use a transaction manager to manage transactions across multiple resource managers. Security management provides authentication, authorization, and secure communication between the J2EE server and the EIS.

Lifecycle management contracts enable an application server to initialize a resource adapter instance during the deployment of the adapter or application server startup. In addition, it enables the application server to notify the resource adapter instance during server shutdown or undeployment of the adapter.

The lifecycle contract provides the mechanism for the application server to manage the lifecycle of the resource adapter instance.

Work management contracts enable the resource adapter to carry out its logic by using threads dispatched by an application server, rather than creating threads on its own. The handshake is done through a `Work` instance submission. This makes the application server threads management more efficient, providing better control over their execution contexts (like security and transaction).

See Also: Oracle Application Server Adapter Concepts Guide, Oracle Application Server Containers for J2EE User's Guide, Oracle Application Server Containers for J2EE Services Guide, and Oracle Application Server Containers for J2EE Security Guide

Configuring the J2CA 1.5 IMS/DB Adapter

To connect to the J2CA 1.5 IMS/DB adapter under Oracle Application Server, perform the following steps:

1. Edit the `oc4j-ra.xml` file, which is located at the following path:

```
root\j2ee\home\application-deployment\default\oracle\oc4j-ra.xml
```

Where `root` is the Oracle Application Server root directory.

2. Set the following settings for each connection:

```
<oc4j-connector-factories>
  <connector-factory location=" " connector-name="Oracle Legacy Adapter">
    <config-property name="userName" value=" "/>
    <config-property name="password" value=" "/>
    <config-property name="eisName" value=" "/>
    <config-property name="serverName" value=" "/>
    <config-property name="workspace" value=" "/>
    <config-property name="portNumber" value=" "/>
    <config-property name="persistentConnection" value=" "/>
    <config-property name="keepAlive" value=" "/>
    <config-property name="firewallProtocol" value=""/>
    <config-property name="connectTimeout" value=""/>
    <config-property name="encryptionProtocol" value=""/>
    <config-property name="encryptionKeyName" value=""/>
    <config-property name="encryptionKeyValue" value=""/>
    <config-property name="fakeXa" value=" "/>
  </connector-factory>
</oc4j-connector-factories>
```

The following table lists the properties that must be specified, and optional properties:

Table 3–1 OC4J Connection Properties

Property	Description
<code>location</code>	Specifies the JNDI location where Oracle Application Server should bind the connection factory instance for application components.
<code>eisName</code>	Sets the name of the adapter to use. The adapter is defined in the Oracle Connect server using Oracle Studio, as described in "Setting Up an Oracle Connect Adapter" on page 2-41.

Table 3–1 (Cont.) OC4J Connection Properties

Property	Description
serverName	Sets the TCP/IP address or host name where the Oracle Connect daemon is running. The daemon runs on the computer specified at the beginning of "Setting Up the IBM z/OS Platform in Oracle Studio" on page 2-14.
workspace	Specifies to the name of a Oracle Connect server workspace to use. The default workspace is Navigator. See Also: "Workspaces" on page C-7 for details about workspaces.
portNumber	Specifies to the TCP/IP port where the Oracle Connect daemon is running on the server. The default port is 2551.
userName (optional)	Specifies a user who can access the Oracle Connect server. The user is defined in the Oracle Connect daemon configuration. See Also: Daemon "Security" and Workspace "Security" for details about users allowed to access an Oracle Connect server.
password (optional)	Specifies a valid password for the user.
persistentConnection (optional)	Set to true or false. When set to true, connections can persist across multiple requests or connection context changes. It is recommended to set this property to true.
keepAlive (optional)	Set to true or false. When set to true, the socket used for the connection is always kept open. It is recommended to set this property to true.
firewallProtocol (optional)	Specifies the firewall protocol used: either none or fixedNat (the Nat protocol using a fixed address for the daemon). The default value is none.
connectTimeout (optional)	Specifies the connection timeout in seconds. The default is 0, meaning that there is no connection timeout.
encryptionProtocol (optional)	Specifies the name of encryption protocol to use. The default is null. The RC4 protocol is supported.
encryptionKeyName (optional)	Specifies the name of the symmetric encryption key to use.
encryptionKeyValue (optional)	Specifies the value of the symmetric encryption key to use.
fakeXa (optional)	When set to true, the XA APIs are internally converted to local transaction APIs. Always set to true.

Using the CCI API to Develop Applications

You can develop applications to run adapter interactions using the Common Client Interface (CCI) API.

Perform the following steps to use the CCI API with the J2CA 1.5 IMS/DB adapter:

1. Select a `ConnectionFactory` entry for the J2CA 1.5 IMS/DB adapter.
2. Create a `Connection` object using this `ConnectionFactory`. A `Connection` is a handle to the underlying network connection to the EIS, which is identified in the `oc4j-ra.xml` file by the `serverName` property.

3. Create a `Connection` object using this `ConnectionFactory`. Specify the interaction properties using an `AttuInteractionSpec` object. The `AttuInteractionSpec` object has the following format:

```
AttuInteractionSpec(java.lang.String name, int verb, int timeOut)
```

The following table describes the properties that can be specified:

Table 3–2 Interaction Spec Properties

Property	Description
name	Specifies the interaction name.
verb	Specifies the mode for the interaction: <code>SYNC_SEND</code> , <code>SYNC_SEND_RECEIVE</code> , or <code>SYNC_RECEIVE</code> .
timeOut	Specifies the time (in milliseconds) to wait for an EIS to run the specified interaction.

The following is an `InteractionSpec` sample:

```
AttuInteractionSpec iSpec = new AttuInteractionSpec("query",
    javax.resource.cci.InteractionSpec.SYNC_RECEIVE, 60);
javax.resource.cci.RecordFactory rf = new AttuRecordFactory(con,
    mcF.getLogger());
javax.resource.cci.MappedRecord queryRecord = rf.createMappedRecord("query"),
queryRecord.put("##text", "select * from disam:nation");
javax.resource.cci.Record oRec = interaction.execute(iSpec, queryRecord);
```

4. Invoke the `execute` method on the interaction to initiate a call to the EIS. Pass any data for the interaction as input and output records.
5. Once the interactions have been processed, close the `Interaction` and `Connection` objects.

Configuring Multiple Adapters

Each J2CA 1.5 IMS/DB adapter requires an entry in the `oc4j-ra.xml` file as described in ["Configuring the J2CA 1.5 IMS/DB Adapter"](#) on page 3-2.

See Also: *Oracle Application Server Adapter Concepts Guide*

Updating Configuration Information

You can change the configuration settings for a resource adapter by editing the relevant `connector-factory` entry in the `oc4j-ra.xml` file. For these changes to take effect, you need to stop and restart Oracle Application Server.

Integrating OracleAS Adapters for IMS/DB with Oracle BPEL Process Manager

To deploy and integrate OracleAS Adapters for IMS/DB with Oracle BPEL Process Manager, you need to configure BPEL Process Manager.

This section includes the following topics:

- [Integrating OracleAS Adapters for IMS/DB with Oracle BPEL Process Manager](#)
- [Configuring Oracle BPEL Process Manager](#)

Integrating OracleAS Adapters for IMS/DB with Oracle BPEL Process Manager

Oracle BPEL Process Manager provides a comprehensive solution for creating, deploying, and managing BPEL business processes. Oracle BPEL Process Manager is based on the Service Oriented Architecture (SOA) to provide enterprises with flexibility, interoperability, reusability, extensibility, and rapid implementation of Web services and business processes. It reduces the overall costs of management, modification, extension, and redeployment of existing business processes. Each business activity is a self-contained, self-describing, and modular application whose interface is defined by the WSDL, and the business process is modeled as a Web Service.

A Web Service is first published and then composed or orchestrated into business flows. Publishing a service is implemented by taking a function within an existing application or system and making it available in a standard way, while orchestration is implemented by composing multiple services into an end-to-end business process. The interactions that are defined as part of the configuration of the OracleAS Adapter for IMS/DB are integrated into the orchestration as PartnerLinks. Every PartnerLink is linked to a WSDL that describes the Web service.

To integrating the OracleAS Adapter for IMS/DB with Oracle BPEL Process Manager, you must perform the following tasks in the specified order:

1. [Installing and Configuring the OracleAS Adapter for IMS/DB](#)
2. [Integrating OracleAS Adapter for IMS/DB with OC4J](#)
3. [Configuring Oracle BPEL Process Manager](#)

See Also: *Oracle Application Server Adapter Concepts Guide.*

Configuring Oracle BPEL Process Manager

This section includes the following topics:

- [Setting up the Connection to the Oracle Connect Server](#)
- [Checking Metadata Availability Using Oracle JDeveloper](#)
- [Configuring the WSDL for Outbound Applications](#)

Setting up the Connection to the Oracle Connect Server

Perform the following steps to set up the connection to the Oracle Connect server:

1. Open the Oracle BPEL Admin window.
2. On the Server tab, on the Configuration tab, specify the following:
 - `LegacyServer`: The IP address of the server where Oracle Connect is installed. For a single server, the default is `localhost`.
 - `LegacyPort`: The port number of the server where Oracle Connect is installed. For a single port, the default is `2551`.
3. Repeat the previous step for each Oracle Connect server to be used by Oracle BPEL Process Manager. Use a comma as a separator between the different servers and ports.
4. Click **Apply**.
5. Restart the server where Oracle BPEL Process Manager is installed.

Checking Metadata Availability Using Oracle JDeveloper

Perform the following steps to verify that the metadata of the Oracle Connect server is available in Oracle BPEL Process Manager:

1. Open Oracle JDeveloper.
2. On the **Connections** tab, expand the **Integration Server** node to view the list of OC4J servers.
3. Expand the node of the OC4J server on which you configured the JCA 1.5 IMS/DB adapter (see [Integrating OracleAS Adapter for IMS/DB with OC4J](#)).
4. Under the **Adapters** node, expand the **Legacy** node to view a list of the Oracle Connect servers that you defined by using the Oracle BPEL Admin window.
5. Under the node of the Oracle Connect server whose metadata you want to check, expand the node of the daemon (**IRPCDINI**) to view a list of workspaces.
6. Under the node of the workspace that contains the adapter that you want to work with, expand the node of the relevant adapter to view a list of interactions.
7. Double-click an interaction to view the WSDL.

Configuring the WSDL for Outbound Applications

When you build an outbound application, Oracle BPEL Process Manager automatically creates the WSDL that corresponds to the interaction. The WSDL specifies the name of the adapter's connection factory as the value of the `adapterInstanceJndi` attribute of the `<jca:address>` element in the `<service>` section. This name is generated automatically. You need to verify that a connection factory with this name exists on the OC4J server. If it does not, you need to

create it, or change the name of the connection factory to the name of a connection factory that exists.

The following is an example of a WSDL for outbound applications:

```
<?xml version = '1.0' encoding = 'UTF-8'?>
<definitions name="findAccount"
targetNamespace="http://xmlns.oracle.com/pcbpel/findIMSAccount/findAccount"
xmlns="http://schemas.xmlsoap.org/wsdl/"
xmlns:legacyReq="noNamespace://findIMSAccount"
xmlns:tns="http://xmlns.oracle.com/pcbpel/findIMSAccount/findAccount"
xmlns:plt="http://schemas.xmlsoap.org/ws/2003/05/partner-link/"
xmlns:jca="http://xmlns.oracle.com/pcbpel/wsdl/jca/"
xmlns:pc="http://xmlns.oracle.com/pcbpel/"
xmlns:legacyRes="noNamespace://findIMSAccount">
  <types>
    <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="noNamespace://findIMSAccount"
targetNamespace="noNamespace://findIMSAccount" elementFormDefault="qualified"
attributeFormDefault="unqualified">
      <xsd:element name="CA_INPUT" type="CA_INPUT" />
      <xsd:complexType name="CA_INPUT">
        <xsd:attribute name="CA_EYE_CATCH">
          <xsd:simpleType>
            <xsd:restriction base="xsd:string">
              <xsd:maxLength value="8" />
            </xsd:restriction>
          </xsd:simpleType>
        </xsd:attribute>
        <xsd:attribute name="CA_ACCT_I_NUM" type="xsd:int" />
      </xsd:complexType>
    </xsd:schema>
    <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns="noNamespace://findIMSAccount"
targetNamespace="noNamespace://findIMSAccount" elementFormDefault="qualified"
attributeFormDefault="unqualified">
      <xsd:element name="CA_OUTPUT" type="CA_OUTPUT" />
      <xsd:complexType name="CA_OUTPUT">
        <xsd:sequence>
          <xsd:element minOccurs="0" maxOccurs="1" name="CA_ACCT_DATA"
type="CA_OUTPUT__CA_ACCT_DATA" />
        </xsd:sequence>
        <xsd:attribute name="CA_RET_CODE" type="xsd:int" />
      </xsd:complexType>
      <xsd:element name="CA_OUTPUT__CA_ACCT_DATA" type="CA_OUTPUT__CA_ACCT_
DATA" />
      <xsd:complexType name="CA_OUTPUT__CA_ACCT_DATA">
        <xsd:sequence>
          <xsd:element minOccurs="0" maxOccurs="1" name="CA_CUST_INFO"
type="CA_OUTPUT__CA_ACCT_DATA__CA_CUST_INFO" />
          <xsd:element minOccurs="0" maxOccurs="10" name="CA_TRAN_HIST"
type="CA_OUTPUT__CA_ACCT_DATA__CA_TRAN_HIST" />
        </xsd:sequence>
        <xsd:attribute name="CA_ACCT_NUM" type="xsd:int" />
        <xsd:attribute name="CA_ACCT_BAL" type="xsd:int" />
      </xsd:complexType>
      <xsd:element name="CA_OUTPUT__CA_ACCT_DATA__CA_TRAN_HIST"
type="CA_OUTPUT__CA_ACCT_DATA__CA_TRAN_HIST" />
      <xsd:complexType name="CA_OUTPUT__CA_ACCT_DATA__CA_TRAN_HIST">
        <xsd:attribute name="CA_TRAN_YYYYMMDD">
          <xsd:simpleType>
```

```

        <xsd:restriction base="xsd:string">
            <xsd:maxLength value="8"/>
        </xsd:restriction>
    </xsd:simpleType>
</xsd:attribute>
<xsd:attribute name="CA_TRAN_AMT" type="xsd:int"/>
<xsd:attribute name="CA_TRAN_REF" type="xsd:int"/>
<xsd:attribute name="CA_TRAN_TYPE" type="xsd:int"/>
</xsd:complexType>
<xsd:element name="CA_OUTPUT__CA_ACCT_DATA__CA_CUST_INFO"
type="CA_OUTPUT__CA_ACCT_DATA__CA_CUST_INFO"/>
<xsd:complexType name="CA_OUTPUT__CA_ACCT_DATA__CA_CUST_INFO">
    <xsd:sequence>
        <xsd:element minOccurs="0" maxOccurs="4" name="CA_CUST_PHONE">
            <xsd:simpleType>
                <xsd:restriction base="xsd:string">
                    <xsd:maxLength value="14"/>
                </xsd:restriction>
            </xsd:simpleType>
        </xsd:element>
    </xsd:sequence>
    <xsd:attribute name="CA_CUST_NAME_F">
        <xsd:simpleType>
            <xsd:restriction base="xsd:string">
                <xsd:maxLength value="10"/>
            </xsd:restriction>
        </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="CA_CUST_NAME_M">
        <xsd:simpleType>
            <xsd:restriction base="xsd:string">
                <xsd:maxLength value="1"/>
            </xsd:restriction>
        </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="CA_CUST_NAME_L">
        <xsd:simpleType>
            <xsd:restriction base="xsd:string">
                <xsd:maxLength value="10"/>
            </xsd:restriction>
        </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="CA_CUST_SOC_SEC">
        <xsd:simpleType>
            <xsd:restriction base="xsd:string">
                <xsd:maxLength value="11"/>
            </xsd:restriction>
        </xsd:simpleType>
    </xsd:attribute>
</xsd:complexType>
</xsd:schema>
</types>
<message name="request">
    <part name="input_findAccount" element="legacyReq:CA_INPUT"/>
</message>
<message name="response">
    <part name="output_findAccount" element="legacyReq:CA_OUTPUT"/>
</message>
<portType name="findAccountPortType">
    <operation name="findAccount">

```

```

        <input name="Input_findAccount" message="tns:request" />
        <output name="Output_findAccount" message="tns:response" />
    </operation>
</portType>
<binding name="findAccountJCABinding" type="tns:findAccountPortType">
    <jca:binding
XMLRecordConverterCallout="oracle.tip.adapter.fw.record.oracle.AttnXMLRecordConver
terImpl" />
        <operation name="findAccount">
            <jca:operation FunctionName="findAccount"
InteractionSpec="com.oracle.adapter.AttnInteractionSpec" ExecutionTimeout="120" />
            <input />
            <output />
        </operation>
    </binding>
<service name="findAccountService">
    <port name="findAccountPort" binding="tns:findAccountJCABinding">
        <jca:address adapterInstanceJndi="eis/legacy/findIMSAccount" />
    </port>
</service>
<plt:partnerLinkType name="findAccountPartnerLinkType">
    <plt:role name="findAccountRole">
        <plt:portType name="tns:findAccountPortType" />
    </plt:role>
</plt:partnerLinkType>
/definitions>

```

BPEL Process Manager Examples

This chapter contains the following topics:

- [Getting Started](#)
- [Deploy a BPEL Outbound Process](#)

Getting Started

This topic describes the components necessary to work with the samples and how to prepare your system.

Prerequisites

The following are installation and configuration requirements for using the examples.

- Personal computer running Microsoft Windows XP or Windows Server 2003 with one GB of RAM.
- The IMS/DB adapter that you are using must be deployed to the Oracle Application Server.
- OracleAS IMS/DB Adapter must be configured for outbound processing. See [Generating Outbound Interactions](#).
- Oracle JDeveloper must be installed.
- Legacy adapter must be deployed.
- Oracle Studio with the necessary machines loaded. See [Configuring Oracle Connect](#).

This chapter provides examples of the configuration steps that are used when using BPEL to work with the Oracle IMS/DB adapters. You should be familiar with the following before working with these examples:

- How to create J2CA connections. See [Chapter 3, "Integrating OracleAS Adapter for IMS/DB with OC4J"](#) for more information.
- How to configure the OracleAS adapters for IMS/DB using Oracle Studio. See [Configuring Oracle Connect](#) for more information.

Integration between the OracleAS adapters for IMS/DB and BPEL has the following processes:

- **Design Time:** The OracleAS adapters for IMS/DB are configured with Oracle Studio as described in [Configuring Oracle Connect](#).
- **Runtime:** After you deploy the BPEL process with JDeveloper, you can test your configurations. See [Runtime Configuration](#).

Deploy a BPEL Outbound Process

This section describes how to create a BPEL outbound process that connects to a OracleAS adapter for IMS/DB. For information on how to configure an IMS/DB adapter for outbound, see [Modeling Interactions for OracleAS Adapter for IMS/DB](#).

To configure a process with the BPEL process manager, you use JDeveloper. This section describes how to create a BPEL outbound process for IMS/DB resource adapters using JDeveloper. The following sections describe how to deploy a BPEL outbound process. The following steps describe the steps necessary to carry out this outbound sample.

- [Beginning Tasks](#)
- [Design-Time Configuration](#)
- [Runtime Configuration](#)

Before you design the outbound process, make sure to integrate and connect your OracleAS adapter for IMS/DB with the BPEL process manager. See [Chapter 4, "Integrating OracleAS Adapters for IMS/DB with Oracle BPEL Process Manager"](#) for more information.

Beginning Tasks

Before you design the outbound process, you must carry out the following:

- Integrate the OracleAS Adapter for IMS/DB with OC4J. See [Integrating OracleAS Adapter for IMS/DB with OC4J](#) for more information.
- Configure the connection for the J2CA IMS/DB resource adapter. You do this by creating a connection factory. See [Configuring the J2CA 1.5 IMS/DB Adapter](#) for information on how to do this.
- Write a schema file. First, create an interaction called `findDoctor` using Oracle Studio. See [Configuring an OracleAS Adapter for IMS/DB for Outbound Interactions](#) for a description on how to create the `findDoctor` interaction.

Write a schema file called `FINDDOCTORSchema.xsd` to define the message schema. The following is an example of the `findDoctor.xsd` file:

```
<schema targetNamespace="http://xmlns.oracle.com/Esb/findDoctorData"
xmlns:cust="http://xmlns.oracle.com/Esb/findDoctorData"
xmlns="http://www.w3.org/2001/XMLSchema">
  <element name="findDoctorData" type="cust:findDoctorDataType"/>
  <complexType name="findDoctorDataType">
    <sequence>
      <element name="Record1" type="string"/>
    </sequence>
  </complexType>
</schema>
```

- Create a BPEL PM Server Connection in JDeveloper.
- Create the WSDL for the interaction. You do this in JDeveloper Connections explorer before you begin to build your endpoint in JDeveloper. JDeveloper will create the WSDL automatically based on the interaction you create. In the Connections explorer, browse for the Oracle Connect server you configured in Oracle Studio (see [Installing Oracle Connect on an IBM z/OS Series Platform](#)), then double-click the `findDoctor` interaction to view and create the WSDL. For a description on how to do this, see [Configuring Oracle BPEL Process Manager](#).

See [Configuring an OracleAS Adapter for IMS/DB for Outbound Interactions](#) for an explanation on how to create the `findDoctor` interaction and for an explanation on the WSDL.

Design-Time Configuration

This section describes the design-time steps necessary to deploy two BPEL outbound processes. The processes use the Web service called `FINDDOCTOR`. This service finds a list of doctors from IMS data. The following are the steps required to create the outbound process.

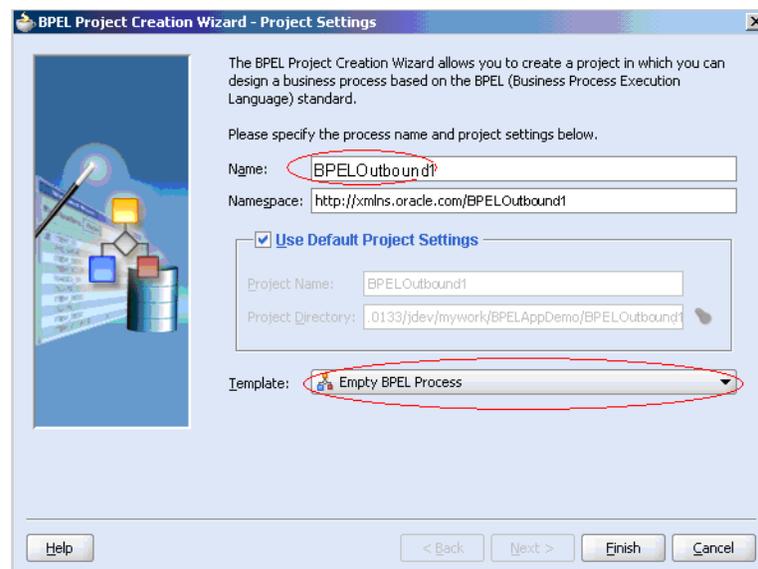
- [Create a BPEL Project for a BPEL Outbound Process](#)
- [Create a Database Adapter to Read the Doctor Table](#)
- [Design a BPEL Outbound Process to Read the String](#)
- [Create a Partner Link to the Database Adapter](#)
- [Edit the Invoke_1 Activity](#)
- [Edit the Assign_1 Activity](#)

Create a BPEL Project for a BPEL Outbound Process

Do the following to create a BPEL project for outbound.

1. In JDeveloper, from the **View** menu, select **Application Navigator**.
2. In the Application Navigator, right-click the application you are working with and select **New Project**. The New Gallery dialog box is displayed.
3. From the **Items** list, select **BPEL Process Project** then click **OK**. The BPEL Project Creation Wizard-Project Settings dialog box is displayed.

Figure 5–1 Outbound Project Settings



4. Do the following in BPEL Project Creation Wizard-Project Settings dialog box:
 - Enter a name for the BPEL process, for example **BPELOutbound1**.
 - From the Template list, select **Empty BPEL Process**.

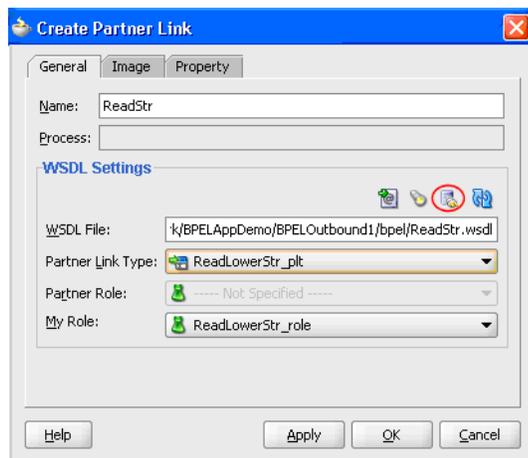
- Click **Next** to review the input/output schema elements or click **Finish**.

Create a Database Adapter to Read the Doctor Table

You create a database adapter to read the DOCTOR table. SOA executes the SQL statement defined in the interaction and passes it to a resource adapter. The resource adapter then processes the information and returns the data. Do the following to create the database adapter.

- Drag a **PartnerLink** into a service lane of the visual editor. The Create Partner Link dialog box is displayed.

Figure 5–2 Partner Link for Database Adapter



- Click the **Adapter Wizard** button. This is the third button in the **WSDL Settings** section of the Create Partner Link dialog box, as shown in the figure above.
- Enter the following information in the Adapter Configuration wizard:
 - Step 1, Adapter Type: Select **Database Adapter**.
 - Step 2, Service Name: type `findDoctor`
 - Step 3, Service Connection. In this step select the database you want to work with.

Click **New** to open the **Create Database Connection** wizard.

Step 1: Select the connection type:

Connection Name: `dbConnection1`

Connection Type: Oracle (JDBC)

Step 2: Authentication.

Enter the User Name, Password, and Role for the database connection

Step 3: Enter the database connection information.

Enter the driver type (`thin`, `oci`), the name of the computer where JDBC is deployed, and its port number. This information should be the same as defined in the JDBC connecton factory. See [Configuring the J2CA 1.5 IMS/DB Adapter](#).

Select Service Name and enter `findDoctor`.

Click **Finish** to go back to the Adapter Configuration wizard.

d. Step 4, File Directories

Directory Names are Specified as: Select **Physical Path**

Directory for Incoming Files (physical path): Enter the full path to the folder where you want the incoming files, for example `C:\temp`.

e. Step 5, File Filtering:

Includes Files with Name Pattern: Enter `*.xml`

f. Step 6, File Polling:

Polling Frequency: enter 1 then select **seconds** from the list.

g. Step 7, Messages:

Schema File URL: Enter `findDoctor.xsd`

Schema Element: Enter `FindDoctorData`

4. Click Finish.

Design a BPEL Outbound Process to Read the String

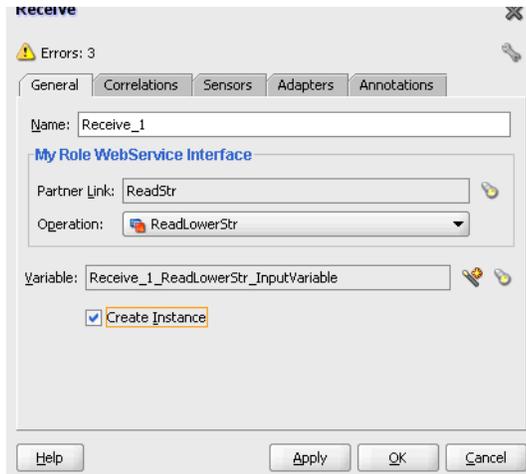
In this step, you design the BPEL process. Do the following to design the BPEL outbound process:

1. From the Component Palette-Process Activities pane, drag a Receive, Assign, and Invoke activity into the editor for the process you created in the [Create a BPEL Project for a BPEL Outbound Process](#) step.

Figure 5–3 Outbound Process



2. In the Visual Editor, connect the Recieve_1 activity to the `findDoctor` database adapter. The Edit Receive dialog box is displayed.

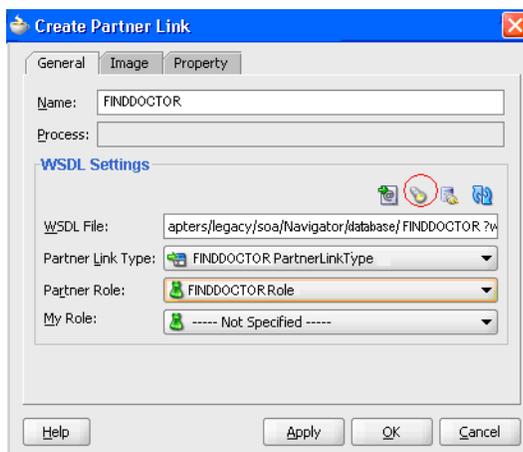
Figure 5–4 Outbound Receive Properties

3. Do the following in the Edit Receive dialog box:
 - Enter a name for the Receive activity, in this example it is `Receive_1`.
 - Make sure to create the variable. Click the first button to the right of the **Variable** field, then click **OK** in the Create Variable dialog box that is displayed.
 - Make sure that the **Create Instance** check box is selected.
 - Click **OK** to close the dialog box and accept the information.

Create a Partner Link to the Database Adapter

In this step, create a partner link to the Database adapter you defined when you created the IMD/DB configuration in Oracle Studio. Do the following to create a partner link.

1. Drag a **PartnerLink** into a service lane of the visual editor. The Create Partner Link dialog box is displayed.

Figure 5–5 Partner Link to IMS/DB Outbound

2. From the Create Partner Link dialog box, click the **Service Explorer** button. This button is the second from the left and is shown in the figure in the previous step. The Service Explorer dialog box is displayed.

3. In the Service Explorer, expand the connection you are using, then expand adapters and then applications, and continue to browse until you find the WSDL file you are using. Select the file and click **OK**.

The **WSDL File** field in the Create Partner Link dialog box displays the path to the WSDL file you selected. The **Partner Link Type** field displays the Partner Link defined in the WSDL file.

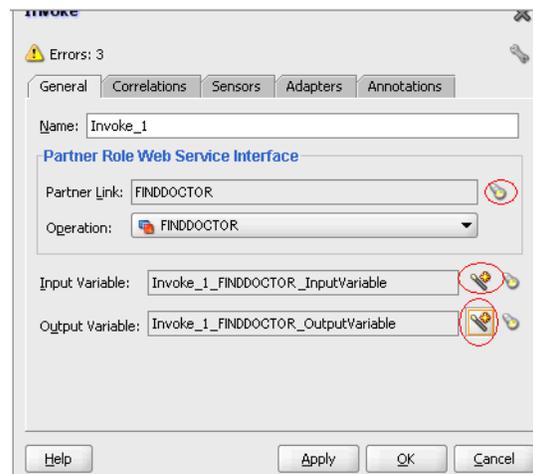
4. Enter the following information in the Create Partner Link dialog box:
 - In the **Partner Role** list, select **FINDDOCTORRole**.
 - In the **My Role** list, select **Not Specified**.

Edit the Invoke_1 Activity

Edit the `Invoke_1` activity that you added to the Visual Editor so that it will invoke the `FINDDOCTOR` service. Do the following to edit the `Invoke_1` activity.

1. Double-click the `Invoke_1` activity to edit it. The Invoke dialog box is displayed.

Figure 5–6 Invoke Dialog Box



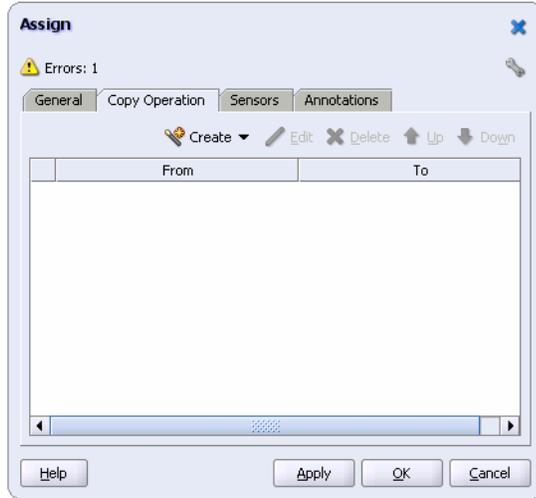
2. In the Invoke dialog box, make sure that the Partner Role Web Service Interface section has the following values:
 - **Partner Link:** `FINDDOCTOR`
 - **Operation:** `FINDDOCTOR`
3. Click the **Automatically Create Input Variable** button. It is the first icon to the right of the **Input Variable** field as shown in the figure in the previous step. The Create Variable dialog appears with the input variable.
4. The Input Variable should be `Invoke_1_FINDDOCTOR_InputVariable`. Click **OK**.
5. Click the **Automatically Create Input Variable** button for the **Output Variable** field.
6. The Output Variable should be `Invoke_1_FINDDOCTOR_OutputVariable`. Click **OK**.

Edit the Assign_1 Activity

You use the assign activity to assign a value to the resource adapter. Do the following to edit the Assign_1 activity.

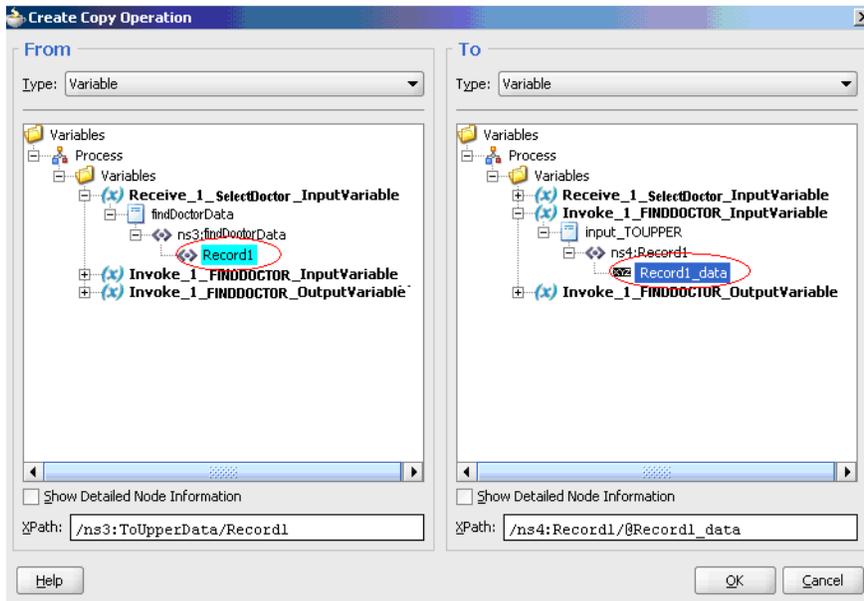
1. Double-click the Assign_1 activity to edit it. The Assign dialog box is displayed.

Figure 5–7 Assign Dialog Box



2. Click the Create list and select Copy Operation. The Create Copy Operation dialog box is displayed.

Figure 5–8 Create Copy

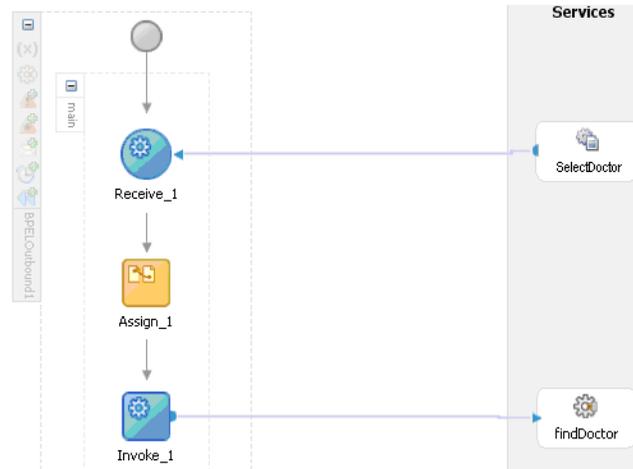


3. On the From side, expand Variables then expand Read_1_SelectDoctor_InputVariable, then expand nsx:findDoctor and select Record1.
4. On the To side, expand Variables then expand Read_1_SelectDoctor_InputVariable, then expand input:findDoctor, then expand nsx:Record1 and select Record1_data.

- Click **OK**. The Copy Operation tab in the Assign window updates to show the rule.

The following figure shows how the final process looks:

Figure 5–9 Final Outbound Process



Runtime Configuration

This section describes how to test the project and run it to see that the outbound process is executed successfully. Do the following to test the outbound process.

- Create a file and call it `FindDoctor.xml` as shown in the following example:

```
<?xml version="1.0" encoding="UTF-8"?>
<CU:FindDoctorData
  xmlns:CU="http://xmlns.oracle.com/Esb/FindDoctorData"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

  <Record1>IMSDB</Record1>
</CU:FindDoctorData>
```

- Save the file to the `C:\temp` folder that was defined for the first adapter. The file is deleted after the SOA server reads the file and complete the process.
- Open the `C:\tempOut` folder that was defined in the second adapter. A file with the following contents is copied to this folder.

```
<?xml version="1.0"?>
<findDoctorData xmlns="http://xmlns.oracle.com/Esb/findDoctorData">
  <Record1 xmlns="">IMSDB</Record1>
```

Configuring an OracleAS Adapter for IMS/DB for Outbound Interactions

This chapter provides an example for creating an OracleAS adapter for IMS/DB. In this case it describes the steps necessary to create an adapter that will get find the names of a doctor and a patient from an IMS/DB data source. To work with an OracleAS adapter for IMS/DB, you must also configure a BPEL endpoint connection. For information on how to create an endpoint, see [BPEL Process Manager Examples](#).

Creating Outbound Interactions with the OracleAS Adapter for IMS/DB

To work with the OracleAS Adapter for IMS/DB and create outbound interactions you must create an IMS/DB data source, import the metadata from IMS/DB, create a database adapter, then create interactions that will be used to access the data.

Requirements

The following is required to carry out the tasks described in this chapter:

- Computer with Windows operating system
- Mainframe computer with z/OS operating system
- Oracle Connect v 10.1.3.4 installed on the Mainframe computer
- Oracle Studio v 10.1.3.4 installed on the Windows computer.

Adding the IMS/DB Hospital Data Source

To create an IMS/DB data source you must do the following:

- [Prepare the System](#)
- [Set up Machine Access to Oracle Connect](#)
- [Add an IMS/DB Data Source](#)
- [Import the Metadata](#)

Prepare the System

Make sure that the Hospital database is available under IMS/DB on the Mainframe computer.

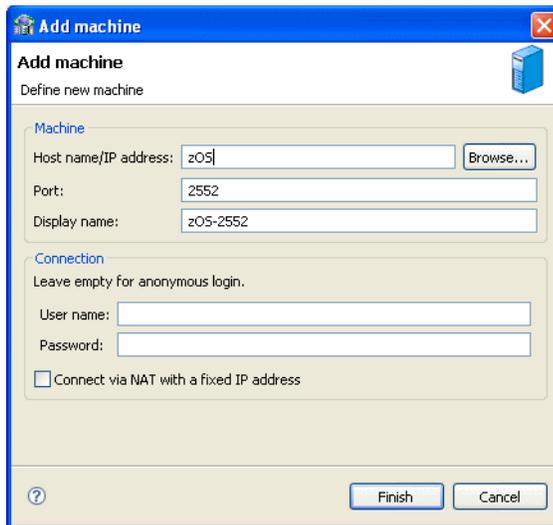
Set up Machine Access to Oracle Connect

You begin by configuring access to the Mainframe computer with your IMS/DB data. You configure this access with Oracle Connect. Open Oracle connect and follow the directions [Setting Up the IBM z/OS Platform in Oracle Studio](#). Enter the following information in the Add machine dialog box:

- **Host name/IP address:** Enter the name or IP address for the Mainframe computer which the Hospital database. This should be installed in the same directory as Oracle Connect.
- **Port:** Enter the port number where the daemon is running. The default port is 2551.
- **Display name:** You do not need to enter any information in this field (By default, the display name will be the host name and the port number).
- **User name:** If the computer you are accessing needs an administrator password. If so enter the name of the computer's administrator.
- **Password:** If necessary, enter the computer administrator's password.
- **Connect via NAT with fixed IP address:** Select this if the machine uses the NAT (Network Address Translation) firewall protocol, with a fixed configuration, mapping each external IP to one internal IP, regardless of the port specified.

The following figure shows the Add Machine dialog box with the correct information:

Figure 6–1 Add Machine Dialog Box



Add an IMS/DB Data Source

After you add the computer configuration to Oracle Studio, you can add your IMS/DB data source to the Configuration view. To add an IMS/DB data source, do the following:

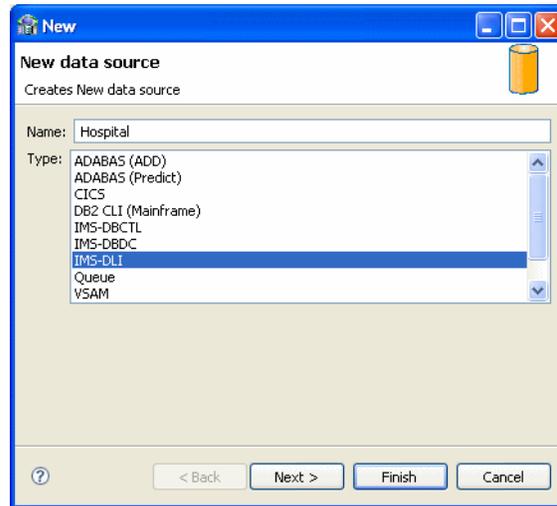
1. Expand the computer you just added and then expand the **NAV** binding.
2. Right-click the **Data sources** folder and then select **New data source**.
3. In the New data source dialog box, type **Hospital** in the **Name** field.

4. In the Type field, select **IMS-DLI** and then click **Finish**. You do not need to add any additional connection information.

For detailed information on adding the IMS/DB data source, see [Configuring the Data Source Driver](#).

The following figure shows the Add data source dialog box with the correct information:

Figure 6–2 Add Data Source Dialog Box



Import the Metadata

You now import the metadata from the IMS/DB data into the data source. For information on how to import data, see [Importing Metadata for the IMS/DB Data Source](#).

In this example you should import the metadata for the `Doctor` and `Patient` columns of the Hospital database. This database is supplied as an example with Oracle Connect and should be installed when you install Oracle Connect on your Mainframe computer.

You will need the following information for the metadata import:

- In the **Get Input Files** step, add the files, `hospital.dbd`, `hospital.cob`, and `hospital.psb`.
- In the **Apply Filters** step, just click **Next**.
- In the **Select Tables** step, select `DOCTOR` and `PATIENT`.
- In the **Match DBD to COBOL** screen, click **Next**.
- In the **Import Manipulation** step, click **Next**.
- In the **Metadata Model Selection** step, select Default value for all tables, then click **Next**.
- In the **Import Metadata** step, select **Yes** and then click **Finish**.

Create the findDoctor and findPatient Interactions

You use a database adapter to create the interactions used to get the data that you need. The interactions are used as services when you set up the endpoint in JDeveloper. For more information on using JDeveloper to create an endpoint, see [BPEL Process Manager Examples](#).

Do the following to create the interactions.

- [Add a Database Adapter](#)
- [Create Interactions](#)

Add a Database Adapter

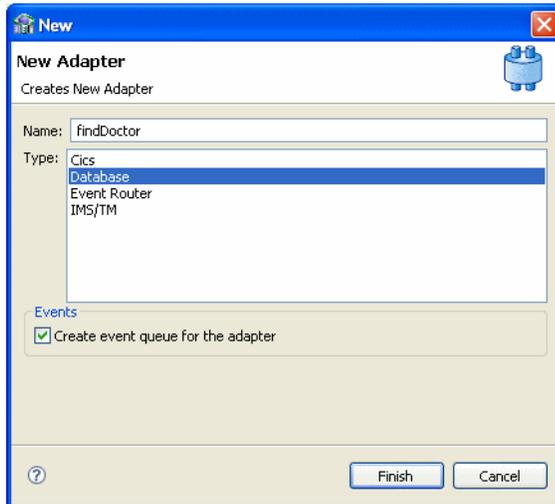
You now create a database adapter, which lets you create interactions to get the information you are seeking. To create a database adapter, do the following

1. Expand the computer you just added and then expand the NAV binding.
2. Right-click the **Adapters** folder and then select **New adapter**.
3. Enter the following information for your adapter, then click **Finish**.
 - **Name:** findDoctor
 - **Type:** Database
 - Select **Create event queue for the adapter**.

For a detailed explanation on how to set up a database adapter, see [Setting Up an Oracle Connect Adapter](#).

The following figure shows the Add adapter dialog box with the correct information:

Figure 6–3 Add Adapter Dialog Box



Create Interactions

You create interactions to work with the data under the Oracle Application Server. You use the interactions that you create when you create your endpoint using JDeveloper. In this example, you should create an interaction called `findDoctor`. To create an interaction, do the following:

1. Expand the computer you just added and then expand the NAV binding.
2. Right-click the adapter you are using and select Show in **Metadata**.
3. Right-click Interactions and select **New**.
4. Enter the following information for in the wizard, then click **Finish**.
 - **Name:** findDoctor
 - **Type:** Database
 - Select **Create event queue for the adapter**.
 - In **Creation Mode:** select **Manual**, and **Database query**.
 - Interaction Name: `findDoctor`.
 - Select **Create New Query**
 - Create a Select statement find a doctor in the database.

For detailed information on how to create an interaction, see [Generating Outbound Interactions](#).

Save all of your information and exit Oracle Studio.

Troubleshooting OracleAS Adapter for IMS/DB

Troubleshooting Oracle AS Adapter for IMS/DB involves checking various definitions and properties in Oracle Connect, including daemon status, workspace options, server parameters, and various system logs.

This section contains the following topics:

- [Troubleshooting the Daemon](#)
- [Resolving Communication Errors](#)
- [Resolving Specific Errors](#)

Troubleshooting the Daemon

Troubleshooting the daemon and the communication between Oracle Application Server and OracleAS Adapter for IMS/DB is performed using Oracle Studio. It is used to monitor the daemon and server activity and control what happens to the daemon and server processes.

See Also: [Appendix C, "Advanced Tuning of the Daemon"](#) for details about the configuration settings.

This section contains the following topics:

- [Starting the Daemon](#)
- [Shutting Down the Daemon](#)
- [Monitoring the Daemon During Run Time](#)
- [Daemon Logs](#)

Starting the Daemon

The daemon is started when OracleAS Adapter for IMS/DB is installed. In case you have shut down the daemon, as described in "[Shutting Down the Daemon](#)" on page 7-2, you can restart the daemon as described in the following task.

Note: The daemon is started on the IBM /OS platform. It cannot be started remotely using Oracle Studio.

Task: Starting the Daemon

Activate `INSTROOT.USERLIB(ATTTDAEMN)` as a started task to invoke the daemon. For example, in the SDSF screen, enter the following command:

```
'/s ATTTDAEMN'
```

Where `INSTROOT` is the high-level qualifier where Oracle Connect is installed.

See Also: ["Starting the Daemon"](#) on page 2-10 for details about the ATTTDAEMN JCL

Shutting Down the Daemon

To shut down the daemon use Oracle Studio, as follows:

1. From the **Start** menu, select **Start, Programs, Oracle**, and then select **Studio**.
2. Select the computer defined in ["Setting Up the IBM z/OS Platform in Oracle Studio"](#) on page 2-14.
3. Right-click the computer and select **Open Runtime Perspective**.
4. In the Runtime Explorer, right-click the computer and select **Shutdown Daemon**.

Monitoring the Daemon During Run Time

Use the Runtime Manager perspective of Oracle Studio to monitor the daemon during run time.

Perform the following steps:

1. From the **Start** menu, select **Start, Programs, Oracle**, and then select **Studio**.
2. Right-click the computer defined in ["Setting Up the IBM z/OS Platform in Oracle Studio"](#) on page 2-14, and select **Open Runtime Perspective**.

You can manage the daemon by expanding the relevant node, daemon, workspace or server process, as described in the following sections.

Daemon (Computer) Options

Right-click the daemon to display the options available for it, including the ability to display the daemon log.

The following table lists the available daemon options:

Table 7-1 Daemon Options

Option	Description
Edit Daemon Configuration	Opens the daemon editor, which enables you to reconfigure the daemon. See Also: Appendix C, "Advanced Tuning of the Daemon" for details about the configuration settings.
Status	Checks the status of the daemon. The information about the daemon includes the name of the daemon configuration used, the active client sessions, and logging information.
Reload Configuration	Reloads the configuration after any changes. Any servers currently started are not affected by the changed configuration. See Also: Appendix C, "Advanced Tuning of the Daemon" for details about the configuration settings.

Table 7–1 (Cont.) Daemon Options

Option	Description
View Log	Displays the daemon log. For details see " Daemon Logs " on page 7-4.
View Events	Displays the daemon events log.
Daemon Properties	Displays information about the computer where the daemon is running, such as the physical address and any username and password needed to access the computer.
Recycle servers	Closes all unused servers and prepares all active servers to close when the client disconnects. New connection requests are allocated with new servers.
Kill servers	Immediately closes all active and unused servers. Note: It is recommended to use this option with caution, as it may lead to data loss.
Shutdown Daemon	Shuts down the daemon on the computer.
Rename	Enables changing the name of the daemon displayed in the Runtime Explorer.
Remove	Removes the daemon from the Runtime Explorer.
Refresh	Refreshes the display.

Workspace Options

Right-click a workspace to display the options available for the workspace, including the ability to display the workspace log.

The following table lists the available options:

Table 7–2 Workspace Options

Option	Description
Edit Workspace Configuration	Opens the daemon editor to enable you to reconfigure the workspace. See Also: Appendix C, "Advanced Tuning of the Daemon" for details about the configuration settings.
Status	Checks the status of the workspace whether it is available or not.
Reload Configuration	Reloads the configuration of the workspace after any changes. Any servers currently started are not affected by the changed configuration.
View Log	Displays the log for all servers for the workspace. For details see " Daemon Logs " on page 7-4
View Events	Displays the workspace events log.
Recycle Servers	Closes all unused servers and prepares all active servers to close when the client disconnects. New connection requests are allocated with new servers.
Kill Servers	Immediately closes all active and unused servers. Note: It is recommended to use this option with caution, as it may lead to data loss.
Remove	Removes the selected workspace from the Runtime Explorer.

Table 7–2 (Cont.) Workspace Options

Option	Description
Disable	Disables the selected workspace.
Refresh	Refreshes the display.

Server Options

Right-click a server to display the options available for the server, including the ability to display the server log.

The options available at the server level are listed in the following table:

Table 7–3 Server Options

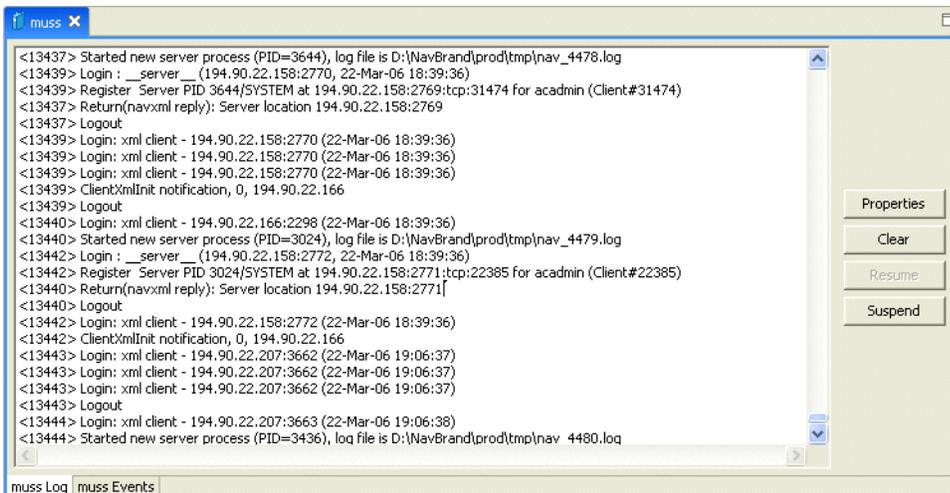
Option	Description
Status	Checks the status of the server. The information about the server includes the server mode and the number of active client sessions for the server.
View Log	Displays the server log. For details see "Daemon Logs" on page 7-4.
View Events	Displays the server events log.
Kill server	Ends the server process, regardless of its activity status. Note: It is recommended to use this option with caution, as it may lead to data loss.
Refresh	Refreshes the display.

Daemon Logs

Oracle Connect produces a number of logs that you can use to troubleshoot problems. The daemon manages the following logs:

- Daemon
- Workspace
- Server process

The Runtime Manager perspective of Oracle Studio provides a monitor for these logs as shown in the following figure:



Display the required log by right-clicking the level you want (daemon, workspace or server) and selecting **View Log**. Each log is displayed in a different tab. You can flick between logs by clicking the required tab.

The Daemon Log Monitor

The daemon log displays activity between clients and the daemon, including clients logging in and logging out from the daemon.

You can change the level of logging by clicking Properties. The following levels of logging are available:

- **none**: The log displays who has logged in and out from the daemon.
- **error**: The log displays who has logged in and out from the daemon and any errors that have been generated.
- **debug**: The log displays who has logged in and out from the daemon, any errors that have been generated, and any tracing that has been specified in the daemon configuration.

See Also: Daemon "[Logging](#)" on page C-3.

The Workspace Log Monitor

The workspace log displays information about the workspace being used by the client.

You can change the level of logging by clicking Properties. The following levels of logging are available:

- **none**: The log displays who has connected and disconnected from the server process.
- **error**: The log displays who has connected and disconnected from the server process and any errors that have been generated.
- **debug**: The log displays who has connected and disconnected from the server process, any errors that have been generated, and any tracing that has been specified in the daemon configuration.

See Also: Workspace "[General](#)" on page C-7.

The Server Log Monitor

The server log displays activity between clients and the server process used by that client to handle the client request.

You can change the level of logging by clicking Properties. The following levels of logging are available:

- **none**: The log displays who has connected and disconnected from the server process.
- **error**: The log displays who has connected and disconnected from the server process and any errors that have been generated.
- **debug**: The log displays who has connected and disconnected from the server process, any errors that have been generated, and any tracing that has been specified in the daemon configuration.

See Also: Workspace "[General](#)" on page C-7.

Resolving Communication Errors

When Oracle Studio disconnects from the IBM z/OS computer, the computer is displayed in Oracle Studio with an X in a red circle. If this situation occurs, try to access the computer later.

The following table describes the various scenarios that may exist when Oracle Application Server disconnects from the IBM z/OS computer.

Table 7-4 Scenarios When a Client Is Disconnected

Scenario	Idle (Not Processing a Client Request)	Processing a Client Request
Explicit Disconnect (client explicitly closes connection or client program terminates)	The server is immediately notified of the disconnect and either becomes available for use by another client or terminates (if it is not reusable).	The server does not know that the client has disconnected and continues processing. When processing completes, the server tries to reply to the client and immediately gets an error that the connection was lost. The server either becomes available for use by another client or terminates (if it is not reusable).
Abrupt Disconnect (client closed without proper shutdown or client system hanged and communication disconnected)	The server does not know that the client has disconnected and remains in the idle state. After timing out based on whichever comes first of the value for the client idle timeout daemon workspace parameter or the TCP/IP <code>KEEPALIVE</code> parameter, the server is notified of the disconnect and either becomes available for use by another client or terminates (if it is not reusable).	The server does not know that the client has disconnected and continues processing. When processing completes, the server tries to reply to the client. After an interval (typically several minutes, depending on the TCP/IP configuration), during which the TCP/IP subsystem retries sending the message to the client, the server assumes that the client has terminated and notifies the server that the connection has been closed. The server either becomes available for use by another client or terminates (if it is not reusable).

To troubleshoot client/server communication problems, you need to be familiar with the following:

- Daemon configuration settings
- Oracle Connect security
- TCP/IP subsystem. Oracle Application Server Adapter for IMS/DB uses TPC/IP for internal intercomputer communications.
- System details, such as the account name and password of the administrator account, the IP address of the computers involved and whether a portmapper is being used.

Resolving Specific Errors

The following error messages relate to errors received from Oracle Connect.

C007: Server initialization failed.

Cause: The daemon failed to start its network service.

Action: Check the processes being run on the system to see whether another daemon or program is using the port specified in the `oc4j-ra.xml` file for the adapter.

Action: Check the TCP/IP subsystem on the current computer by trying to ping it or run FTP or Telnet to or from it.

Action: Check whether the daemon has privileges to use the TCP/IP services on the current computer with the port specified in the oc4j-ra-xml file for the adapter.

C008: Setting server event handler failed.

Cause: Internal error.

Action: Contact Oracle Support Services.

C009: IRPCD process has been terminated by user request.

Cause: This message is informational only. The daemon successfully shut down.

Action: No action required.

C00A: Application %s not found.

Cause: The requested workspace does not exist.

Action: Check that the workspace defined in the oc4j-ra-xml file is also defined in the daemon configuration on the IBM z/OS platform. Use the Status option in the Runtime Manager perspective.

C00B: Invalid IRPCD client context.

Cause: A non-Oracle Connect program is trying to connect to the daemon.

Action: Check the processes and kill the relevant process with a system command.

C00C: Daemon request requires a server login.

Cause: A non-Oracle Connect server or program was trying to use a daemon service reserved for Oracle Connect servers.

Action: Check the processes and kill the relevant process with a system command.

C00D: Daemon request requires a client login.

Cause: The requested daemon requires a valid client login, which was not supplied.

Action: Reissue the command and specify a username and password.

Action: Edit the user profile in Oracle Studio to specify a valid username and password for the IBM z/OS platform.

See Also: ["Setting Up Run-Time User Access to the IBM z/OS Platform"](#) on page 2-17.

C00E: Daemon request requires an administrator login.

Cause: The requested daemon service requires an administrative login.

Action: Edit the daemon security in Oracle Studio to specify a valid administrator username and password.

See Also: ["Security"](#) on page C-5.

C00F: Anonymous client logins are not allowed.

Cause: The daemon is configured to require a valid username and password, which were not supplied.

Action: Enable anonymous client access in daemon security in Oracle Studio.

See Also: ["Security"](#) on page C-5.

Action: Edit the user profile in Oracle Studio to specify a valid username and password for the IBM z/OS platform.

See Also: ["Setting Up Run-Time User Access to the IBM z/OS Platform"](#) on page 2-17.

C010: Anonymous server logins are not allowed.

Cause: Internal error.

Action: Contact Oracle Support Services.

C011: Client has already timed out.

Cause: A server process was started on behalf of a client and the client has timed out before the server completed its startup.

Action: Increase the Connect timeout value for the server workspace in the WS Info. tab of the daemon configuration.

See Also: ["General"](#) on page C-7.

C012: Invalid username/password.

Cause: Invalid username/password supplied when logging on to the daemon.

Action: See the daemon log file for the reason that the username/password were not accepted.

Action: Edit the user profile in Oracle Studio to specify a valid username and password for the IBM z/OS platform.

See Also: ["Setting Up Run-Time User Access to the IBM z/OS Platform"](#) on page 2-17.

Action: Make sure the daemon is started from an APF-authorized account that is allowed to check for system usernames and passwords.

C014: Client connection limit reached - try later.

Cause: The maximum number of server processes for the workspace has been reached, and none of the active servers could accept the client connection.

Action: Increase the value of the Number of sub-tasks in the WS Server section of the daemon configuration.

See Also: ["Server Mode"](#) on page C-11.

Action: Try running the command later.

C015: Failed to start server process.

Cause: The Oracle Connect daemon failed to start a server process or the started server failed upon starting up.

Action: See the daemon and server logs for the reason the server did not start. For example, you might receive a message with a reason specified in the log file similar to the following: [C015] Failed to start NAVIGATOR server process: No server account name defined for anonymous client; code: -1601: SQL code: 0

Action: If you use impersonation, check the user profile on the client. Also see C069.

To set impersonation: APF authorize all the steplibs in the server script on z/OS computer. For example:

```
setprog... ada622-volume adavol
CICS.CICS.SDFHEXCI - p390dx
INSTROOT.load - 111111
INSTROOT.loadaut - 111111
```

INSTROOT is the high level qualifier where Oracle Connect is installed.

In the **Security** tab of the Navigator workspace, under the daemon node in the Configuration Explorer, check **Use specific workspace account** and clear the **Workspace account** field of all values.

C016: Unexpected server state.

Cause: Internal error.

Action: Contact Oracle Support Services.

C017: Active daemon clients exist. Shutdown canceled.

Cause: One or more clients are still connected to the daemon.

Action: Wait until all the clients log off the daemon and then retry the shutdown operation.

C019: Request is not granted because someone else is locking it.

Cause: A request to lock a resource managed by the daemon was denied because another user has locked the resource.

Action: Wait for the other user to release the resource.

C01A: Lock %s not found.

Cause: A request to free a resource was denied because the caller did not lock that resource (for example, another user shut down the daemon you are working with).

Action: Contact Oracle Support Services.

C01B: Unexpected error in %s.

Cause: Internal error.

Action: Contact Oracle Support Services.

C01C: Cannot update configuration without _APPLICATIONS lock.

Cause: Internal error.

Action: Contact Oracle Support Services.

C01D: Need to lock the application first.

Cause: Internal error.

Action: Contact Oracle Support Services.

C01F: Cannot set configuration of a deleted application.

Cause: Internal error.

Action: Contact Oracle Support Services.

C020: Failed in looking up host name (gethostname())

Cause: Cannot connect to the remote computer.

Action: Check that the name specified for the computer in the oc4j-ra.xml file is correct.

Action: Check that a domain name server (DNS) is available to look up the host name.

Action: Check the TCP/IP subsystem on the computer by trying to ping it or run FTP or Telnet to or from it.

C021: Required variable %s not found

Cause: An environment variable required by the Oracle Connect server was not defined when the server started up.

Action: Check whether the startup script makes any changes to the environment variables used by Oracle Connect.

Action: Check whether the system-defined environment size is sufficiently large for Oracle Connect.

C022: Server failed to connect and register with the daemon.

Cause: An Oracle Connect server started by the daemon was not able to connect or register back with the daemon.

Action: Try to connect again.

Action: Increase the Connect timeout value for the server workspace in the WS Info. section of the daemon configuration.

See Also: ["General"](#) on page C-7.

Action: Check that the startup script for the workspace launches the correct version of Oracle Connect.

Action: Increase the value of the `Set maximum number of servers` and `Maximum` parameter for the Clients per server limit in the WS Server section of the daemon configuration.

See Also: ["Server Mode"](#) on page C-11.

C023: Call made to unregistered module %d.

Cause: Internal error.

Action: Contact Oracle Support Services.

C024: Failed to create a socket.

Cause: An error occurred within the TCP/IP subsystem.

Action: Check whether you have sufficient system privileges.

Action: Check the TCP/IP subsystem on the computer by trying to ping it or run FTP or Telnet to or from it.

C025: Failed to set socket option %s

Cause: An error occurred within the TCP/IP subsystem.

Action: Check whether you have sufficient system privileges.

Action: Check the TCP/IP subsystem on the computer by trying to ping it or run FTP or Telnet to or from it.

C026: Failed to bind server to port %s

Cause: An Oracle Connect server or daemon was not able to bind to the specified port.

Action: Check whether another program is holding the port that was specified in the oc4j-ra.xml file for the adapter.

Action: Check whether you have sufficient system privileges.

C027: Cannot create TCP service for %s

Cause: An error occurred within the TCP/IP subsystem

Action: Check the TCP/IP subsystem on the computer by trying to ping it or run FTP or Telnet to or from it.

C028: Unable to register (%s, %d, tcp)

Cause: This error may happen when a portmapper is used (*host:a*) but the portmapper is not available.

Action: Enable the portmapper.

Action: Avoid using the portmapper (by not using *:a* when starting the daemon).

C029: Failed to create a server thread

Cause: Internal error.

Action: Contact Oracle Support Services.

C02A: Server thread failed to start

Cause: Internal error.

Action: Contact Oracle Support Services.

C02B: Stopping the %s server - no client

Cause: A server that was started by the Oracle Connect daemon to service a client did not get a client connection request within one minute. The server terminates.

Action: In most cases, the client was terminated by a user request, so no specific action is required.

Action: If no client can connect to the server, it may be that the server has multiple network cards and the Oracle Connect daemon is not aware of this. In this case, start the daemon with an IP address.

C02C: Unexpected event - a termination signal intercepted

Cause: Internal error.

Action: Contact Oracle Support Services.

C02D: Modified transport, context unknown/lost

Cause: Internal error.

Action: Contact Oracle Support Services.

C02F: Corrupted arguments passed to procedure

Cause: Internal error.

Action: Contact Oracle Support Services.

C030: Unable to free arguments for %s() of %s

Cause: Internal error.

Action: Contact Oracle Support Services.

C031: Cannot register a non-module RPC %s

Cause: Internal error.

Action: Contact Oracle Support Services.

C032: An IRPCD program is required

Cause: Internal error.

Action: Contact Oracle Support Services.

C033: An IRPCD super-server is required for module events

Cause: Internal error.

Action: Contact Oracle Support Services.

C034: An invalid super-server module ID was specified, %d

Cause: Internal error.

Action: Contact Oracle Support Services.

C035: Out of memory

Cause: Not enough memory to service a client request.

Action: Increase process memory quota or add memory to the system.

C036: Failed to register RPC procedure module %s

Cause: Internal error.

Action: Contact Oracle Support Services.

C037: Failed to register an invalid RPC procedure number %x

Cause: Internal error.

Action: Contact Oracle Support Services.

C038: Cannot reregister RPC procedure number %x

Cause: Internal error.

Action: Contact Oracle Support Services.

C042: Remote call to %s failed; %s

Cause: Remote call to API failed.

Action: Check the daemon log file.

Action: If necessary, change the level of detail written to the log file to help resolve the problem.

See Also: ["Logging"](#) on page C-3.

C043: Failed to connect to host %s;%s

Cause: The remote host is not correctly defined to Oracle Connect or is not working.

Action: Check the remote computer definition in the oc4j-ra-xml file for the adapter.

Action: Check that the daemon is up on the IBM z/OS platform. Use the Status option in the Runtime Manager perspective.

Action: Check the network connection by trying to ping the host computer or run FTP or Telnet to or from it.

C045: Failed to create a service thread

Cause: The server failed to create a thread to service a client request.

Action: A system or process quota limit has been exceeded. Either increase the quota or lower the `Clients per server limit` field value in the WS Info. section of the daemon configuration.

See Also: ["General"](#) on page C-7.

C047: %s out of memory

Cause: Not enough memory was available to Oracle Connect to complete a requested operation.

Action: Terminate unnecessary processes running on the server.

Action: Add more memory to the system.

Action: Allow the process to use more memory.

Action: Limit the number of processes the daemon may start. If the demand for servers exceeds the number of available servers, clients get a message telling them the maximum number of servers has been reached and asking them to try again later.

C066: Communication error with the server%s

Cause: Connection to the Oracle Connect daemon or server failed, or an established session with a server has failed.

Action: Check the remote computer definition in the `oc4j-ra.xml` file.

Action: Check that the daemon is up on the IBM z/OS platform. Use the Status option in the Runtime Manager perspective.

Action: In case of a network problem, check the network connection by trying to ping the host computer or run ftp or telnet to or from it.

C067: Unexpected error occurred in server function %s

Cause: One of the server functions has exited with an exception (such as an `abend`, or an Invalid Instruction).

Action: Contact Oracle Support Services.

C068: Fail to login daemon

Cause: The daemon is not running on the server computer.

Action: Use the Status in Oracle Studio Runtime Manager perspective to check whether a daemon is running on the server

Action: Have the system administrator reinstall Oracle Connect on the server.

C069: Fail to get server

Cause: The Oracle Connect daemon on the server computer could not start a server process to serve the client. A separate message provides more detail on why the server process could not start.

Action: There are many possible causes of this error. If the cause is not clear from the related message, see the Oracle Connect daemon log file on the server

Action: The resolution to this error is highly dependent on the particular cause. The following are some typical causes and resolutions.

Action: Some process creation quota was exceeded. Either try again later or increase the quota or the other relevant system resources.

Action: The server startup script failed.

Action: The username given is not allowed to use the requested server. Use an authorized username.

Action: A limit on concurrent clients for a server has been reached. Try again later.

Action: If you use impersonation, check the user profile on the client. Also see C015.

C06A: Failed to connect to server

Cause: The server assigned to the client did not accept the client connection. A separate message provides more detail about why the server process did not accept the connection.

Action: See the daemon and server log files for the reason that the server was not available to accept its assigned client.

C06B: Disconnecting from server

Cause: A network failure, or a server computer failure or a server program failure caused the connection to abort. The currently active transaction is aborted as well.

Action: Oracle Connect automatically tries to reestablish a connection with a server upon the next SQL command issued against the server. Once the network or computer failure is corrected, the connection to the daemon is reestablished automatically.

C070: Server failed to send reply to the client

Cause: Server terminated unexpectedly.

Action: Unless the client was intentionally stopped (for example, using Control-C), contact Oracle Support Services.

C071: Connection to server %s was disconnected. Cursors state was lost.

Cause: Either a network failure, a server computer failure or a server program failure caused the connection to abort. The currently active transaction is aborted as well.

Action: Normally, Oracle Connect automatically tries to create a new session with the server upon the next attempt to access the server. If the network and server are accessible, the next operation should succeed. Otherwise, the network or server computer should be fixed before connection can be resumed.

Action: In case of a server crash not related to callable user code, contact Oracle Support Services.

C072: Reconnect to server %s

Cause: This is an informational message only. The client has reestablished its connection with the server.

Action: No action is required.

C073: The parameters passed to the admin server are invalid: %s

Cause: Internal error.

Action: Contact Oracle Support Services.

C074: No authorization to perform the requested operation (%s)

Cause: User/account has insufficient privileges.

Action: Grant administrative privileges to the user/account using the Administrator parameter of the Daemon Security or WS Security sections in the daemon configuration.

See Also: Daemon "[Security](#)" on page C-5 or "[Security](#)" on page C-16.

C075: Failed to register daemon in the TCP/IP service table

Cause: Registration of the daemon in the TCP/IP services file has failed.

Action: Check that the account running the daemon has the permissions to update the TCP/IP services file.

E001: Failed in lock/release operation

Cause: A lock or release operation of a global resource has failed. A separate message provides more details. The separate message specifies the cause of this error.

Action: There are various causes for this error, including lack of sufficient privileges or a system resource shortage.

J0006: Operation on already closed connection was requested

Cause: A request using a connection that was closed was attempted.

Action: Reopen the connection and try again.

J0028: Internal Error: Unknown XML tag %s

Cause: Internal error.

Action: Contact Oracle Support Services.

J0030: Internal Error: Method %s needs to be overwritten

Cause: Internal error.

Action: Contact Oracle Support Services.

J0031: Internal Error: Required attribute %s not found in %s verb

Cause: Internal error.

Action: Contact Oracle Support Services.

J0032: Internal Error: %s ACP object was returned instead of %s as expected

Cause: Internal error.

Action: Contact Oracle Support Services.

J0033: Internal Error: Attempt to work with closed socket

Cause: Internal error.

Action: Contact Oracle Support Services.

J0034: Internal Error: corrupted message; %s bytes read instead of %s as expected

Cause: XML sent from the client to the server has become corrupted.

Action: Check compression settings for XML transferred from the client to the server. If the settings are OK, retry sending the request from the client to the server.

J0035: Internal Error: Invalid redirection address %s returned by daemon

Cause: Internal error.

Action: Contact Oracle Support Services.

J0036: %s: %s

Cause: One of the following errors was received from the server: 0 - server.internalError, 1 - client.xmlError, 2 - client.requestError, 3 - client.noActiveConnection, 4 - server.resourceLimit, 5 - server.redirect, 6 - client.noSuchResource, 7 - client.authenticationError, 8 - client.noSuchInteraction, 9 - client.noSuchConnection, 10 - server.notImplemented, 11 - server.xaProtocolError, 12 - server.xaUnknownXID, 13 - server.xaDuplicateXID, 14 - server.xaInvalidArgument, 15 - client.autogenRejected, 16 - server.xaTransactionTooFresh, 17 - server.resourceNotAvailable, 18 - client.authorizationError, 19 - server.configurationError

Action: Review the server log file to determine the problem.

J0037: Internal Error: No ACP response when %s was expected

Cause: Internal error.

Action: Contact Oracle Support Services.

J0039: Internal Error: ACP root is not found in the XML

Cause: Internal error.

Action: Contact Oracle Support Services.

J0040: Internal Error: Input record is required for interaction %s execution

Cause: Internal error.

Action: Contact Oracle Support Services.

J0048: Invalid metadata type %s is passed to %s function

Cause: A request for metadata was not fulfilled.

Action: Check the validity of the request.

J0050: Key of the put method must be of type string

Cause: In either a GET or PUT operation, the key must be a string.

Action: Change the key used in the operation to a valid key.

J0059: Value %s is invalid for attribute %s

Cause: A request for metadata was not fulfilled.

Action: Check the validity of the request.

J0068: Value must be of type string

Cause: In a PUT operation, the value must be a string.

Action: Change the value used in the operation to a valid value.

J0069: Value must be of type MappedRecord

Cause: In a PUT operation, the value must be a mapped record.

Action: Change the value used in the operation to a valid value.

J0070: Value must be of type MappedRecord[]

Cause: In a PUT operation, the value must be mapped record array.

Action: Change the value used in the operation to a valid value.

J0071: Bad key for mapped record, #element or #element[] is required

Cause: In a PUT operation, the value must be mapped record array.

Action: Change the key used in the record to a valid key.

J0072: Value must be of type Object[]

Cause: In a PUT operation, the value must be mapped record array.

Action: Change the value used in the operation to a valid value.

J0078: In nonpersistent connection and the nonkeep alive encryption is not supported - ignored

Cause: Encryption is not supported for nonpersistent connections.

Action: There is no action to take. This warning can be ignored.

J0079: Invalid argument passed to %s - Argument: %s, Value: %s

Cause: The value pass.

Action: Change the argument used to a number.

Advanced Features of OracleAS Adapter for IMS/DB

Oracle Connect includes a number of tuning parameters that can improve performance. Specifically, the daemon can be configured to optimize communication between the IBM z/OS platform and a client.

In addition, the binding environment can be tuned to optimize the request handling.

This section contains the following topics:

- [Configuring the Daemon for High Availability](#)
- [Configuring a Binding Environment](#)
- [Migration Considerations](#)
- [Security Considerations](#)
- [Transaction Support](#)

Configuring the Daemon for High Availability

The daemon workspace is responsible for allocating server processes to clients. You can configure a workspace to use a pool of server processes so that a server process is always available for a client request.

Use Oracle Studio to maintain daemon and daemon workspace parameters to control the allocation of server processes and their management in a pool.

You can also have a number of daemon workspace configurations. Thus, you can create individual workspaces for use with different adapters.

Adding a New Daemon Workspace Configuration

Use Oracle Studio to add a new daemon configuration. You can set up different daemon configurations for different situations.

Perform the following steps to add a new daemon workspace configuration:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. In the Design perspective, Configuration view expand the **Machines** folder.
3. Expand the machine you are working with.
4. Expand the **Daemons** folder. The daemon configurations available on this computer are listed.

5. Right-click **IRPCD** and select **New Workspace**. The New Daemon Workspace screen is displayed.
6. Specify a name for the new workspace and optionally, provide a description.
7. Specify whether you want it to have default settings or copy the properties of an existing workspace.
To copy the properties of an existing workspace, click **Ellipsis** and select the workspace from which you want to copy the properties.
8. Click **Next**. The Select Scenario screen is displayed.
9. Select **Application Server using connection pooling** and click **Next**.
10. Continue through the wizard, specifying the required values for the workspace.
11. Click **Finish**.

The workspace is displayed under the **IRPCD** daemon node.

Editing the Workspace

You edit a workspace by using the tabs described in the following table:

Table 8–1 Workspace Properties tabs

Tab	Description
General	Specifies general information including the server type, the command procedure used to start the workspace, the binding configuration associated with this workspace (which dictates the data sources and applications that can be accessed) the timeout parameters, and logging information (which dictates the data sources and applications that can be accessed), the timeout parameters, and logging information.
Server Mode	Contains the workspace server information including features that control the operation of the servers started up by the workspace and allocated to clients.
Security	Specifies administration privileges, user access, ports available to access the workspace and workspace account specifications.

Use Oracle Studio to access these tabs, as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. In the Design perspective Configuration view, expand the **Machines** folder and then expand the machine where you want to edit the workspace.
3. Expand the **Daemons** folder. The daemon available on this computer are listed.
4. Expand the **IRPCD** daemon. The daemon workspaces are listed.
5. Right-click the workspace you are editing and select **Open**.
6. Click the tab that contains the information you want to edit. For full details of the tabs and the fields in these tabs, see [Workspaces](#).
7. After editing the workspace, click **Save**.

Configuring the Server Mode

The server mode dictates how the daemon starts up new processes. The daemon supports the following server modes:

- **singleClient:** Each client receives a dedicated server process. The account in which a server process runs is determined either by the client login information or by the specific server workspace.

This mode enables servers to run under a particular user account and isolates clients from each other (because each receives its own process). However, this server mode incurs a high overhead due to process startup times and may use a lot of server resources (because it requires as many server processes as concurrent clients).

- **multiClient:** Clients share a server process and are processed serially. This mode has low overhead because the server processes are already initialized. However, because clients share the same process, they may impact one another, especially if they issue lengthy queries.

The number of clients that share a process is determined by the Clients per server limit (the maximum number of concurrent clients a server process for the current workspace accepts).

- **reusable:** This is an extension of the single client mode. Once the client processing finishes, the server process does not die and can be used by another client, reducing startup times and application startup overhead.

This mode does not have the high overhead of single client mode because the servers are already initialized. However, this server mode may use a lot of server resources (because it requires as many server processes as concurrent clients).

The other modes can be set so that the server processes are reusable by setting the number of times a process can be reused with the `Reuse limit` value (the maximum number of times a particular server process can be reused or how many clients it can serve before it is retired). Reuse of servers enhances performance because it eliminates the need to repeat initializations. However, reuse runs a risk of higher memory leakage over time. The default value for the `Reuse limit` field is `None`, indicating that no reuse limit is enforced.

Set the server mode in the **Server Mode** tab of the daemon workspace editor as shown in the following figure:

Figure 8–1 The Server Mode Tab

When using any of the server modes you can specify a pool of server processes. These server processes are started when the daemon starts and are maintained in a pool. The server processes are available for use by new client requests from the pool, saving initialization time. Instead of starting a new server process each time one is requested by a client, the client receives a process immediately from the pool of available processes. When the client finishes processing, this server process either dies, or if reusable servers have been specified, it is returned to the pool.

You set up a pool of server processes by specifying the following parameters in the **Server Mode** tab.

- **Port Range:** Select the range for specific firewall ports through which you access the workspace. Determines the range of ports available for this workspace when starting server processes. Use this option when you want to control the port number, so that Oracle Connect can be accessed through a firewall.

Enter the port range in the following fields:

- **From:** Enter the highest numbered port in the range
 - **To:** Enter the lowest numbered port in the range
- **Use Default Port Range:** Select this to use the port range that is defined in the daemon.
- **Maximum number of server processes:** Enter the maximum number of server processes that can run at the same time.
- **Limit server reuse:** Select this if you want to limit the number of servers that can be reused. If this is selected, the **Reuse limit** parameter is available.

If **Limit server reuse** is selected, in the field next to the check box, enter the maximum number of times a server can be reused. Select the maximum of clients accepted in a server process.

A one-client server can be reused after its (single) client has disconnected. Reuse of servers enhances startup performance because it avoids the need to repeat initialization.

This parameter is not available if the Limit server reuse parameter is not selected.

This parameter is not available if the server mode value is **singleClient**.

- **Limit Concurrent clients per server:** Select this to limit the number of clients that a server can accept for the current workspace process.

If this is not selected, the number of clients is unlimited.

If **Limit concurrent clients per server** is selected, in the field next to the check box, enter the maximum number of clients that a server process for the current workspace accepts. The default for this field is **None**, indicating that the number of clients for each server is unlimited. This field is available if the server mode value is **multiClient** or **multiThreaded**.

- **Specify Server Priority:** Set the priority for servers. For example, a workspace for applications with online transaction processing can be assigned a higher priority than a workspace that requires only query processing. The lower the number, the higher the priority. For example, workspaces with a priority of 1 are given a higher priority than workspaces with a priority of 2.

Note: This is unavailable if **Use default server priority** is selected.

- **Use default server priority:** Sets the priority to 0. There is no specific priority for this workspace. Clear this check box to set a priority in the **Specify Server Priority** parameter.
- **Keep when daemon ends:** Select this to kill all servers started by that daemon when a daemon is shutdown, even if they are active. Select this if you want the servers for the workspace to remain active, even after the daemon has been shut down. If selected, it is the responsibility of the system operator or manager to ensure that the servers are eventually killed. This must be done at the system level.
- **Number of prestarted servers in pool:** The number of server processes that are prestarted for this workspace when the daemon starts up. These are available for use by new client processes with minimal initialization time. Instead of starting a new server process each time one is requested by a client, the daemon immediately allocates (to the client) a server from a pool of available servers. When the number of available server processes drops lower than the value specified in the Minimum number of available servers field, the daemon again starts server processes until the specified number of available servers is reached. The default for this parameter is 0, meaning that no servers are prestarted for this workspace.
- **Number of spare servers:** The minimum number of server processes in the prestarted server's pool before the Oracle Connect daemon resumes creating new server processes (up to the number specified in the Initial number of servers field value, described earlier). If this parameter is set to a value greater than the Initial number of servers field value, the daemon considers the value to be the same as the value specified in the Initial number of servers field. In this case, a new server process is started and added to the pool each time a server process is removed from the pool and allocated to a client). The default for this parameter is 0, which means that new servers are created only when there are no other available servers.
- **Number of sub-tasks:** The number of sub-tasks for a server that are prestarted for this workspace when the daemon starts up. In addition to setting up a pool of server processes as described earlier, you can set additional server processes as

sub-tasks by specifying this parameter. If you set 10 servers and 10 prestarted sub-tasks then 100 tasks are started (10 sub-tasks for each process).

Configuring a Binding Environment

Each binding configuration includes the following information:

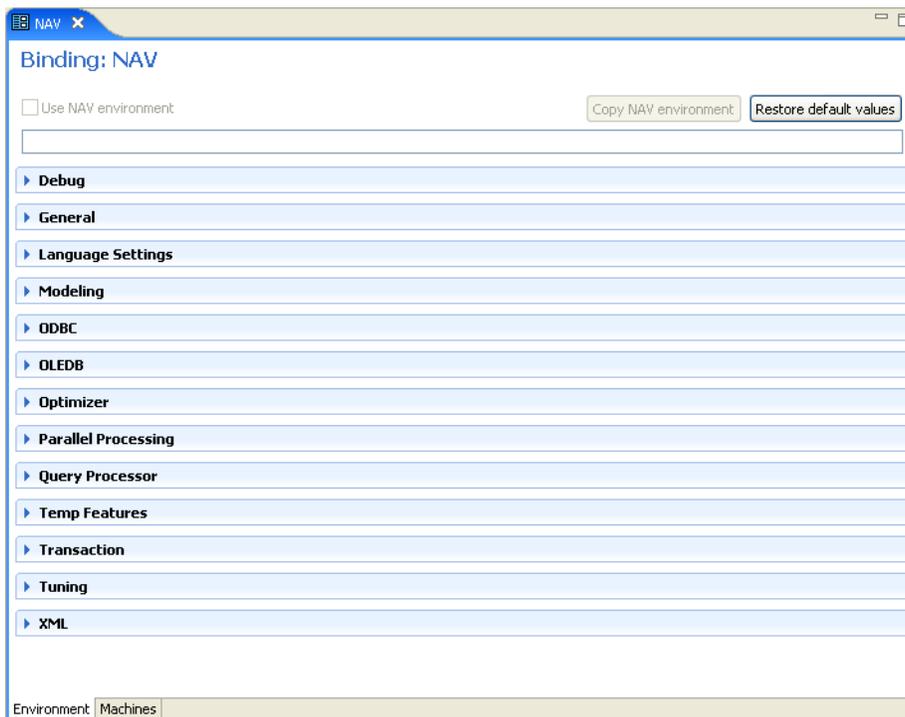
- Environment settings, which are used to configure the environment used by any of the adapters defined in the binding.
- Application adapters on the current computer.

To configure environment settings in Oracle Studio, perform the following steps:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. In the Design perspective Configuration view, expand the **Machine** folder, then expand the machine where you want to configure the binding.
3. Expand the **Bindings** folder. The binding available on this computer are listed.
4. Right-click **NAV** and select **Open**.
5. In the **Environment** tab, edit the environment settings as needed. To edit an environment setting, expand the property category and click the value to edit.

The binding **Environment** tab is shown in the following figure:

Figure 8–2 The Binding Properties tab



The binding environment is divided into the following categories:

- [Debug](#)
- [General](#)
- [Language](#)

- Modeling
- ODBC
- OLEDB
- Optimizer
- Query Processor
- Parallel Processing
- Transactions
- Tuning
- XML

Debug

The following table lists the parameters that define debugging and logging operations:

Table 8–2 Debug Parameters

Parameter	Description
ACX trace	Select this for the the input xml sent to the back-end adapter and the output xml returned by the back-end adapter to be written to the log.
GDB Trace	This parameter is not applicable for use with OracleAS Adapter for IMS/DB.
General trace	Select this to log general trace information. The default writes only error messages to the log. Note: Changing the default setting can degrade performance.
Query warnings	This parameter is not applicable for use with OracleAS Adapter for IMS/DB.
Add timestamp to traced events	Select this to add a timestamp on each event row in the log.
Query Processor trace	This parameter is not applicable for use with OracleAS Adapter for IMS/DB.
Binary XML Log Level	Select the binary XML log level from the list. The following logging levels are available: <ul style="list-style-type: none"> ■ None ■ API ■ Info ■ Debug
Log file	The high-level qualifier of the log file for messages. The following type of message are written to the log: <ul style="list-style-type: none"> ■ Error messages ■ Trace information and information about the query optimization strategy, if <code>generalTrace</code> is set to <code>true</code>.
Trace Directory	This parameter is not applicable for use with OracleAS Adapter for IMS/DB.
Optimizer trace	This parameter is not applicable for use with OracleAS Adapter for IMS/DB.

Table 8–2 (Cont.) Debug Parameters

Parameter	Description
Transaction extended logging	Select this for the transaction manager to write additional information about transactions to the log.

General

The following table lists the parameters that define various operations the directory where temporary files are written:

Table 8–3 General Parameters

Parameter	Description
NAV_UTIL editor	This parameter is not applicable for use with OracleAS Adapter for IMS/DB.
Temporary Dir	The directory where temporary files are written, including the temporary files created for use by hash joins and for sorting files. The default is the current high-level qualifier.
Year 2000 policy	<p>Determines the way two-digit years are converted into four-digit years. When the <code>year2000Policy</code> parameter is not set, or when it is set to a value outside the range of values defined for the policy, as described in the following paragraphs, a default value of 5 and the Sliding Base Year policy is used. Two policies are provided:</p> <p>Fixed Base Year: <code>year2000Policy</code> is set to a value greater than, or equal to 1900. In this case, the value of <code>year2000Policy</code> is the first four-digit year after 1900 that can be represented by a two-digit year. For example, if <code>year2000Policy</code> is set to 1905, the years 2000->2004 will be represented by 00->04. All other two digits will map to 19xx.</p> <p>This solution is most required if there is live data at the low end (close to the year 1900), which the user wants to keep with the current two-digit format.</p> <p>The user will probably change the base date only after ensuring that these old dates have been deleted from the data source.</p> <p>Sliding Base Year: <code>year2000Policy</code> is set to a positive value less than 100. In this case, the value of <code>year2000Policy</code> represents the number of years ahead of the current year that can be represented by a two-digit number. With each passing year the earliest year that can be represented by a two-digit number changes to a year later.</p>
Cache buffer size	Enter the number of bytes to be used for a memory buffer on a client machine, which is used by the Oracle Connect client/server to store read-ahead data. The default is 200000

Language

The following table lists the parameters that define globalization support:

Table 8–4 Language Settings Parameters

Parameter	Description
Language	Identifies the application language. A default codepage is selected based on the value specified for this parameter. See also: Appendix E, "Globalization Settings" .
Code Page	For use with globalization support to identify the codepage for the workspace. See also: Appendix E, "Globalization Settings" .
NLS String	Specifies the codepage used by a field whose data type is defined as <code>nlsstring</code> . Use this for a field whose codepage is other than that of the computer codepage. This parameter includes the following values: <ul style="list-style-type: none"> ■ The name of the codepage. ■ Whether the character set reads from right to left (as in middle eastern character sets). The default is <code>false</code> .

Modeling

The **Modeling** parameters are not applicable with OracleAS Adapter for IMS/DB.

ODBC

The **ODBC** parameters are not applicable for use with OracleAS Adapter for IMS/DB.

OLEDB

The **OLEDB** parameters are not applicable for use with OracleAS Adapter for IMS/DB.

Optimizer

The **Optimizer** parameters are not applicable for use with OracleAS Adapter for IMS/DB.

Query Processor

The **Query Processor** parameters are not applicable for use with OracleAS Adapter for IMS/DB.

Parallel Processing

The **Parallel Processing** parameters are not applicable for use with OracleAS Adapter for IMS/DB.

Transactions

The following table lists the parameters that define transaction support:

Table 8–5 Transaction Parameters

Parameter	Description
Transaction extended logging	Select this to write extended information about transactions to the transaction manager log files.

Table 8–5 (Cont.) Transaction Parameters

Parameter	Description
Commit on destroy	Select this to commit all single-phase commit transactions opened for a data source, if a connection closes while the transaction is still open.
Disable 2PC	Select this to disable two-phase commit capabilities, even in drivers that support two phase commit.
User commit confirm table	This parameter is not applicable for use with OracleAS Adapter for IMS/DB.
Transaction log file	The high-level qualifier and name of the log file that logs activity when using transactions. The <code>logfile</code> parameter can also include the keyword <code>NORRS</code> after a comma (so that the format is <code>log,NORRS</code>) when RRS is not running on the z/OS platform.
Recovery Delay	The number of minutes from the start of a transaction before any recovery operation on that transaction can be attempted. The default is 15 minutes.
Time limit	Enter the time to wait for a transaction to complete before an error is returned. This parameter is also used when performing a RECOVERY, and it then indicates the number of minutes to wait before a forced activity can be performed, since the last transaction activity.
Conversions Select one:	<p>No conversion: Select this if you want all transactions to remain as sent. This is selected by default</p> <p>Convert all to distributed: Select this to convert all simple transactions into distributed transactions.</p> <p>Convert all to simple: Select this to convert all distributed transactions into simple transactions.</p>

Tuning

The **Tuning** parameters are not applicable for use with OracleAS Adapter for IMS/DB.

XML

The following table lists the parameters that define XML support:

Table 8–6 XML Category Parameters

Parameter	Description
COM maximum XML in memory	Specifies the maximum size of an XML document held in memory. The default is 65535 bytes.
COM maximum XML size	Specifies the maximum size of an XML document passed to another computer. The default is 65535 bytes. Note: When you increase this value for this property, you may need to increase the value for the Maximum XML in memory property in the daemon. For more information on daemons, see "Control".
COM XML transport buffer size	Enter the maximum size of the internal communications buffer. The default value (-1) indicates there is no size limit.

Table 8–6 (Cont.) XML Category Parameters

Parameter	Description
XML date format	Enter the date format to use for XML. The options are: <ul style="list-style-type: none"> ■ ISO (the default): The date format is: YY-MM-DDThh:mm:ss [.ss. .] ■ ODBC: The date format is: YYYY-MM-DD HH:MM:SS [.NNN. . .]
Replace invalid XML characters	Select this to replace invalid XML characters with a '?'. This property is used for diagnostic and troubleshooting purposes.
XML trim char columns	Select this to enable padded spaces to be trimmed from XML string columns when the record format is fixed. By default this is selected, and padded spaces are trimmed for fixed size character columns. If you do not want this behavior, clear this check box.

Migration Considerations

You can migrate an adapter configuration from one platform to another. The configuration information is stored in the Oracle Connect repository on the source platform and is exported to an XML file which can then be imported to the target platform.

Note that when migrating a configuration, any file names and paths that are specific to the source platform must be changed to valid files on the target platform.

To migrate an adapter configuration using Oracle Studio, perform the following steps:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. In the Design perspective, Configuration view, expand the **Machines** folder.
3. In the Configuration Explorer, right-click the required computer, and select **Export XML definitions**.
4. Specify the path and name of the XML file where the XML representation of the computer and its complete configuration is stored.
5. Edit any paths in the XML definition to the paths required on the target platform. For example, the setting for the serverLogFile might need changing, depending on the platform.
6. Set up the target platform in Oracle Studio in the same way you set up the source platform, as described in "[Setting Up the IBM z/OS Platform in Oracle Studio](#)" on page 2-14.
7. In the Configuration Explorer, right-click the target computer and select **Import XML definitions**.
8. Import the XML file to the target platform.

Security Considerations

Oracle Connect works within the confines of the platform security system. For example, on an z/OS computer with RACF installed, and with the workspace server mode set to multi-tasking, a TRACROUTE VERIFY is performed for each task in the address space, according to the client connection.

In addition, Oracle Connect provides the following security:

- A binary XML encryption mechanism, which is activated as follows:

1. The client's first message to the server includes a pre-defined shared key, including the key name and value in the connection string. The server gets the key value for the key name passed from the client from the native object store (NOS).
 2. The server generates a random 128-bit RC4 session key which is returned encrypted to the client, using the shared key. If no predefined shared key is provided, then a predefined, hardcoded key is used (this key is hardcoded on the client and on the server).
 3. Passwords are always encrypted when passed over the wire, using an RC4, 128-bit session key, regardless of whether the entire session is encrypted or not.
 4. If a predefined shared key was provided, then the entire session is encrypted. Otherwise, only the password exchange is encrypted (using the hardcoded key).
- Credentials: Passwords and usernames exchanged over the network are encrypted using a pre-defined, hardcoded, 128-bit RC4 session key.
 - Design Time: Security within Oracle Studio to grant access to Oracle Studio itself and to grant access to computers, user profiles and workspaces.
 - Run time: Security used to access IMS/DB, including controlling the daemon for the access.

Setting Design Time Security

Setting design time security is described in the following sections:

- Securing access to Oracle Studio is described in "[Setting Password Access to Oracle Studio](#)" on page 2-15.
- Securing rights to configure a computer in Oracle Studio is described in "[Specifying Users with Administrative Rights](#)" on page 2-16.
- Securing access to user profiles is accomplished by right-clicking the relevant user profile in Oracle Studio and selecting **Change Master Password**. In the dialog box that is displayed, specify a password that must be provided in the future to edit the specific user profile.
- Securing access to workspaces is accomplished by right-clicking the relevant workspace in Oracle Studio and selecting **Set Authorization**. In the dialog box that is displayed, specify a valid user and password that must be provided in the future to edit the specific workspace.

Setting Runtime Security

During run time, security considerations are implemented as follows:

- When the client request accesses the legacy platform through the daemon, either anonymous access is allowed or a valid user name and password must be provided for the computer in the user profile. The `userName` and `password` properties in the J2CA 1.5 IMS/DB adapter are used at this stage to access the daemon.

Note: The user name used to access the daemon must also be the name of a user profile used.

- Access by the client must be through a valid port, according to the port range entered in the **Server** section of the workspace **Server Mode** tab in Oracle Studio. For more information, see the explanation of the workspace [Server Mode](#) on page C-11.

Note: Access to the legacy platform through a firewall using the NAT protocol is specified when the computer is added to Oracle Studio.

- To be allocated a server process, the client must be granted anonymous access to the workspace or be listed in the **Authorized Workspace Users** section of the workspace **Security** tab in Oracle Studio. For more information see the explanation of the workspace ["Security"](#) on page C-16.
- The ability to run commands on the daemon, such as starting or stopping a daemon or ending server processes is available only to administrators who have been registered in Oracle Connect as a daemon administrator. A client is registered as a valid daemon administrator in the daemon **Security** tab in Oracle Studio, as described in daemon ["Security"](#) on page C-5.

Note: You can also specify administrators who can run commands only at the level of the workspace. Select these administrators in the workspace **Security** tab, as described in the explanation of workspace ["Security"](#) on page C-16.

Transaction Support

OracleAS Adapter for IMS/DB supports global transactions and can fully participate in a distributed transaction if you access the IMS/DB data under CICS.

Note: To use Oracle Application Server Adapter for IMS/DB under CICS with global transactions, you must have RRS installed and configured.

To work with global transactions, select **Convert all to distributed** in the Transaction section of the binding environmental properties. See ["Transactions"](#) in the ["Configuring a Binding Environment"](#) section.

To use the global-transaction capability to access data on the or z/OS computer, define every library in the ATTSRVR JCL as an APF-authorized library.

To define a DSN as APF-authorized, in the SDSF screen, enter the following command:

```
"/setprog apf,add,dsn=instroot.library,volume=ac002"
```

Where ac002 is the volume where you installed Oracle Connect and INSTROOT is the high-level qualifier where Oracle Connect is installed.

If the Oracle Connect installation volume is managed by SMS, when defining APF-authorization enter the following command in the SDSF screen:

```
"/setprog apf,add,dsn=instroot.library,SMS"
```

Make sure that the library is APF-authorized, even after an IPL (restart) of the computer.

If RRS is not running, OracleAS Adapter for IMS/DB can participate in a distributed transaction, as the only one-phase commit resource, if the **Transaction log file** environment property includes the keyword `NORRS`. See "[Transactions](#)" in the "[Configuring a Binding Environment](#)" section.

Note: If a log file is not specified, then the format for the `logFile` parameter when RRS is not running is `,NORRS`.

Advanced Tuning of the Metadata

Oracle Studio enables you to define outbound adapter interactions. In addition, Oracle Studio defines input and output structures used for these interactions. The interactions and input and output structures are maintained as metadata by Oracle Studio in the **Metadata** tab of the Design perspective.

This appendix contains the following sections:

- [Metadata for the IMS/DB Data Source](#)
- [Adapter Metadata](#)

Metadata for the IMS/DB Data Source

Using Oracle Studio, perform the following steps to maintain the metadata for the IMS/DB data source:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Expand the **Machines** folder, then expand the machine with the metadata you are working with.
3. Expand the **Bindings** folder.
4. Expand the **NAV** binding.
5. Expand the **Data sources** folder to display the data sources.
6. Right-click the IMS/DB data source and select **Show Metadata View** to display the **Metadata** view.

The **Metadata** tab is shown in the following figure:

7. Right-click the table you want to view in the Metadata Explorer and select **Edit**.

The metadata editor opens, displaying the **General** tab, with general table details. The following tabs are used to view and edit the metadata:

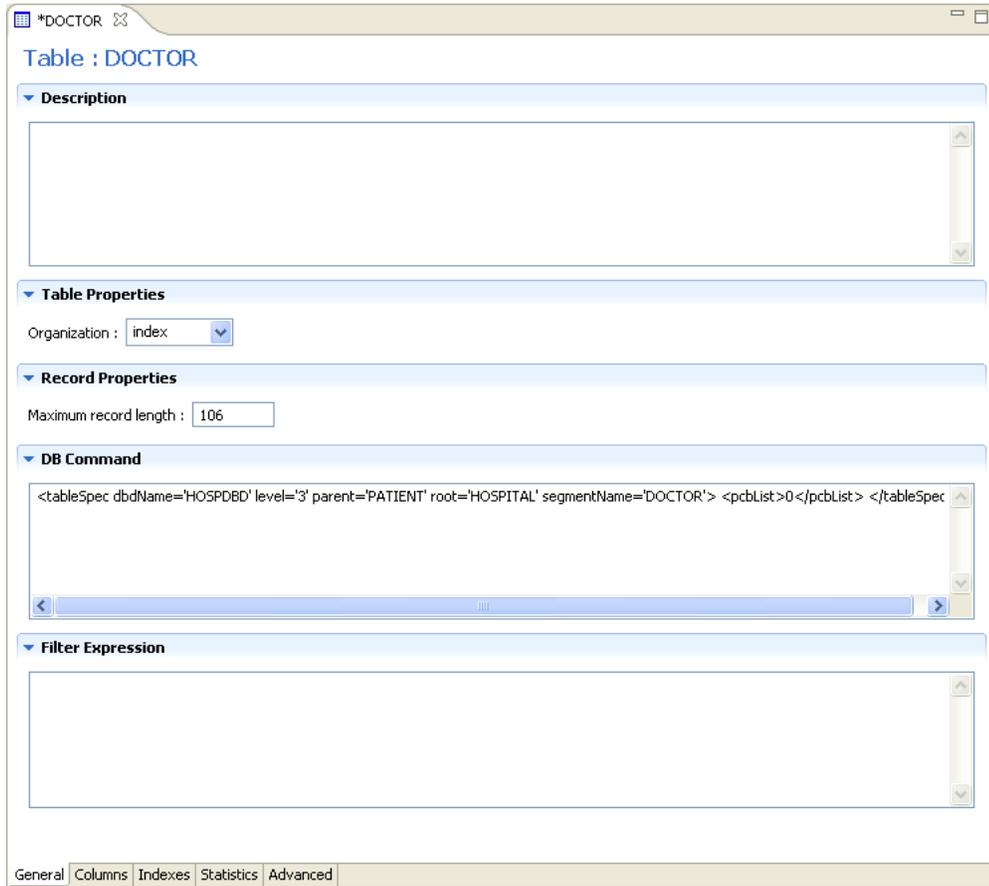
- [General Tab](#)
- [Columns Tab](#)
- [Indexes Tab](#)
- [Statistics Tab](#)
- [Advanced Tab](#)

General Tab

Use the **General** tab to maintain information about the whole table, such as the table name and the way the table is organized.

The **General** tab is shown in the following figure:

Figure A-1 The General tab



The **General** tab comprises fields, as listed in the following table:

Table A-1 General Tab Components

Field	Description
Description	An optional description of the table.
Table Properties	
Data file location	The name of the file that contains the table. You must enter the full path and include the file extension for the file. For example, D:\COBOL\orders.cob. You can click Browse and browse to find and enter the location of the table file. Note: Do not enter the file extension for DIASM or CIASM files.

Table A-1 (Cont.) General Tab Components

Field	Description
Organization	Select how the record represented by the table is organized. The options that are displayed depend on the record. The following options are available: <ul style="list-style-type: none"> ■ Index ■ Sequential ■ Relative: Used with RRDS files. Access to a specific record number of a relative file is performed by using a pseudo column to specify the record position. The hash symbol (#) is used to specify a pseudo column. For example: <pre>SELECT * FROM colleges WHERE # = 6</pre>
Record format	Specifies how the record, represented by the table, is formatted. The options that are displayed depend on the record. The IMS/DB records have a fixed format.
Maximum record length	The maximum allowable size of a record (in bytes).
DB Command	IMS/DB specific commands are displayed in the DB Command section of the General tab. The information displayed is generated automatically when the metadata is generated and should not be modified.
Filter Expression	A WHERE clause. This clause is added to every query accessed using this metadata. The filter is specified without the WHERE keyword. Specify a filter when more than one logical table is stored in the same physical file.

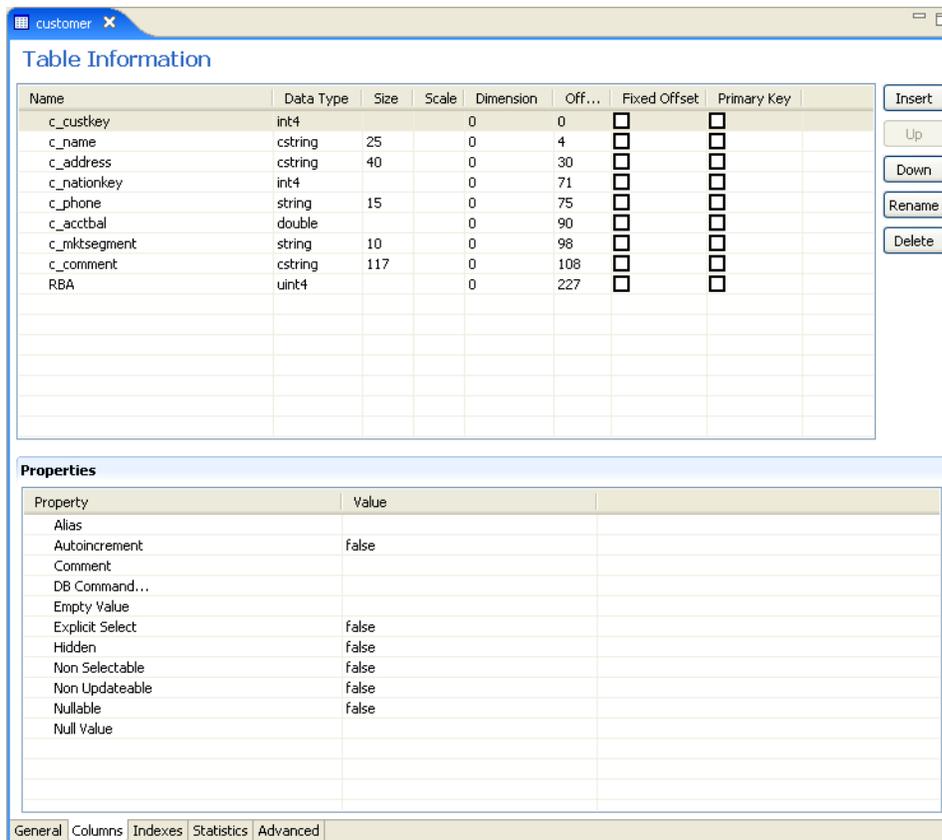
Columns Tab

Use the **Columns** tab to specify metadata that describe the table columns. The tab is divided into the following:

- [Column Definition Section](#)
- [Column Properties](#)

The **Columns** tab is shown in the following figure:

Figure A-2 The Columns tab



Column Definition Section

The top section of this tab lets you define the columns in the source data. You can click in any row (which represents a column in the data base table) to edit the information. The following table describes this section.

Table A-2 Metadata Column Tab Definitions

Field name	Description
Name	The name of the column
Data type	The data type of the column. Selecting this field displays a drop-down box listing the possible data types.
Size	The size of the column
Scale	The information entered in this field depends on the data type: For decimal data types, this is the number of digits to the right of the decimal place. This number must not be greater than the number of digits. The default value is 0. For scaled data types, this is the total number of digits. The number must be negative.
Dimension	The maximum number of occurrences of a group of columns that make up an array. The (+) to the left of a column indicates a group field. This type of field will have a Dimension value. Click (+) to display the group members.
Offset	An absolute offset for the field in a record.

Table A–2 (Cont.) Metadata Column Tab Definitions

Field name	Description
Fixed offset	<p>This column lets you determine whether to calculate the offset. There are two options:</p> <ul style="list-style-type: none"> ■ Calc offset: If you clear this check box, the absolute offset for each of the columns is calculated. ■ Fixed offset: When you select this check box, you will have a fixed offset. <p>The offset of a field is usually calculated dynamically by the server at runtime according the offset and size of the proceeding column. Select the check box in this column to override this calculation and specify a fixed offset at design time. This can happen if there is a part of the buffer that you want to skip.</p> <p>By selecting the check box, or by editing the offset value you pin the offset for that column. The indicated value is used at runtime for the column instead of a calculated value. Note that the offset of following columns that do not have a fixed offset are calculated from this fixed position.</p>
Primary Key	Select this to indicate that this column is a primary key.

The buttons on the right side of the tab are used to manipulate the data in this section of the tab. The following table describes how you can move around in this section.

Table A–3 Definition Section Buttons

Button	Description
Insert	Inserts a column to the table. You can insert a new column. If the table has arrays, you can add a new child column.
Up	Moves your selection to the column directly above where the currently selected column.
Down	Moves your selection to the column directly below where the currently selected column
Rename	Lets you rename the selected column.
Delete	Deletes the selected column.
Find	Click this button to open a list of all columns in the database. Select a column and click OK to select it in the table.

Column Properties

You can change the property value by clicking in the **Value** column. Follow these steps for displaying the column properties.

To display the column properties

- Select a column from the Column Definition (top) section.

The properties for the column are displayed at the bottom of the tab.

The following table shows some of the properties available for selected columns.

Table A-4 Metadata Properties

Property	Description
Alias	A name used to replace the default virtual table name for an array. Virtual table names are created by adding the array name to the record name. When an array includes another array the name of the nested array is the name of the record and the parent array and the nested array. When the default generated virtual table name is too long, use an Alias to replace the long name.
Autoincrement	The current field is updated automatically by the data source during an INSERT statement and is not explicitly defined in the INSERT statement. The INSERT statement should include an explicit list of values. This attribute is used for fields such as an order number field whose value is incremental each time a new order is entered to the data source.
Comment	A short note or description about the column.
DB command	IMS/DB specific commands for the column. The information displayed is generated automatically when the metadata is generated and should not be modified.
Empty value	The value for the field in an insert operation, when a value is not specified.
Explicit Select	When true, the current field is not returned when you execute a SELECT * FROM . . . statement. To return this field, you must explicitly ask for it in a query, for example, SELECT NATION_ID, SYSKEY FROM NATION where SYSKEY is a field defined with Explicit Select. You cannot use an asterisk (*) in a query where you want to retrieve a field defined with the Explicit Select value.
Hidden	The current field is hidden from users. The field is not displayed when a DESCRIBE statement is executed on the table.
Non Selectable	When true, the current field is never returned when you execute an SQL statement. The field is displayed when a DESCRIBE statement is executed on the table.
Non Updateable	If true, the current field cannot be updated.
Nullable	This value allows the current field to contain NULL values.
Null value	The null value for the field during an insert operation, when a value is not specified.
Chapter of	This property shows that the set member field is a chapter of an owner field. A value for this property must be used when accessing a set member as a chapter in an ADO application. This property is used for DBMS metadata.
OnBit	The position of the bit in a BIT field and the starting bit in a BITS field.
Subfield of	The value is generated automatically when you generate metadata from Adabas data that includes a superdescriptor based on a subfield. A field is created to base this index on, set to the offset specified as the value of the Subfield start field. If no value is entered in the Subfield start field, the subfield is set by default to an offset of 1.
Subfield start	The offset within the parent field where a subfield starts.

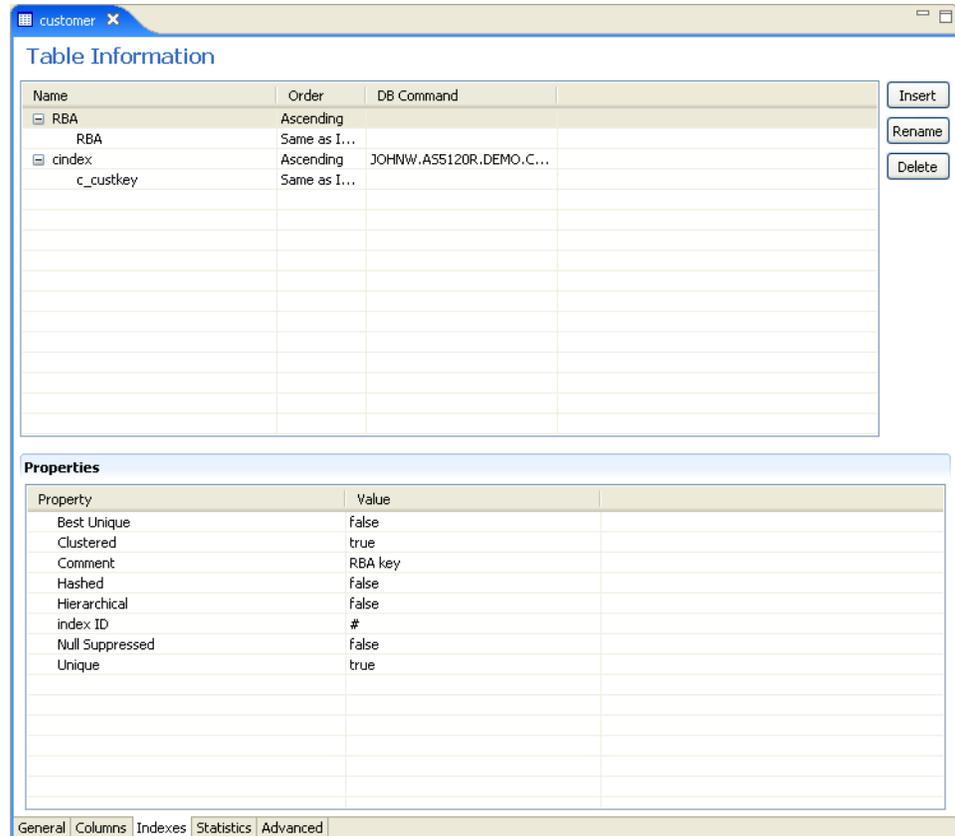
Indexes Tab

Use the **Indexes** tab to specify metadata describing the indexes of a table.

Note: The Indexes tab contains information only if the **Organization** field in the Table tab is set to Index.

The **Indexes** tab is shown in the following figure:

Figure A-3 The Indexes tab



This tab has two sections. The first section lets you define the index keys for the columns in the table. The bottom of the tab lists the properties for each of the columns at the top.

The following sections describe the **Indexes** tab:

- [Table Information](#)
- [Properties](#)

Table Information

The following table describes the fields for the top part of the tab, which defines the indexes used for the table.

Table A–5 *Indexes Tab Components*

Field	Description
Name	The names of existing indexes for the current table.
Order	The ordering of the rows retrieved by the index.
DB Command	IMS/DB-specific commands for the index. The information displayed is generated automatically when the metadata is generated and should not be modified.

The buttons on the right side of the tab are used to manipulate the data in this section of the tab. The following table describes how you can move around in this section.

Table A–6 *Index Definition Buttons*

Button	Description
Insert	Inserts an index to the table.
Rename Index	Lets you rename the selected index.
Delete	Deletes the selected index.

Properties

You can index properties for each index column. Follow these steps for displaying the properties for each index.

To display the index properties

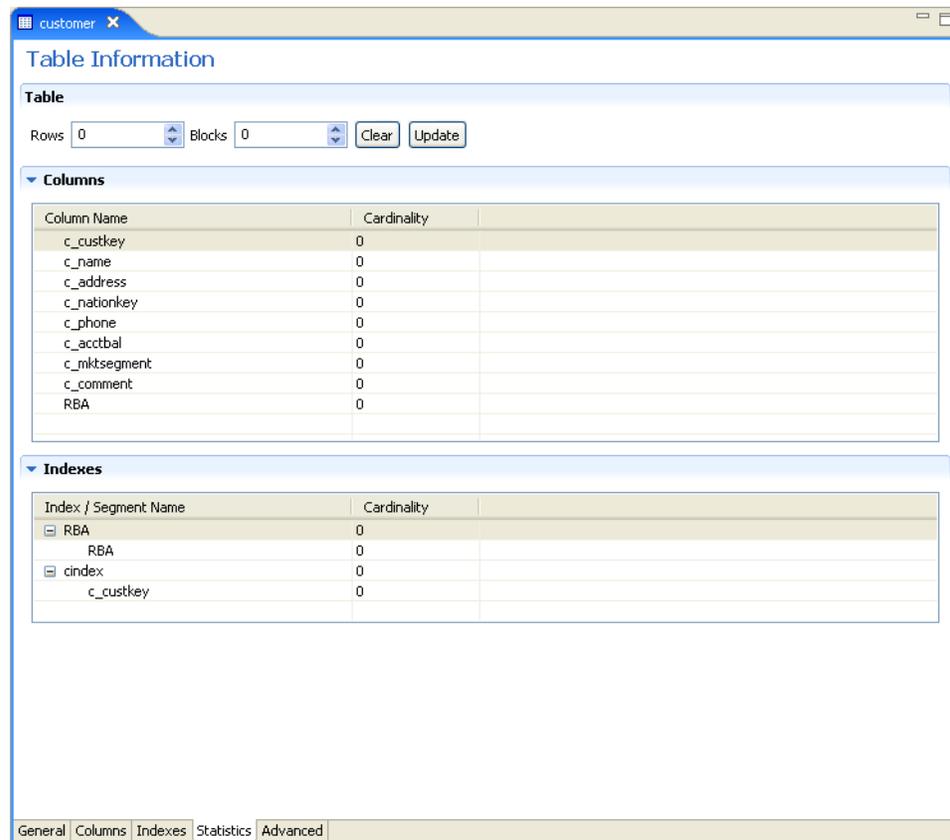
- Select a column from the Index Definitions (top) section.

The properties for the column are displayed at the bottom of the tab.

This properties displayed at the bottom of the tab describe the index or segment. The properties available depend on the data source.

Statistics Tab

Use the **Statistics** tab to update statistics for a table. The **Statistics** tab is shown in the following figure:

Figure A-4 The Statistics tab

The **Statistics** tab comprises fields as listed in the following tables:

Table A-7 Statistics tab Components

Field	Description
No. of rows	The approximate number of rows in the table. If the value is -1, then the number of rows in the table is unknown (a value was not supplied and the update statistics utility was not run to update the value). A value of 0 indicates that this table is empty.
No. of blocks	The approximate number of blocks in the table. Note: If neither the number of rows nor the number of blocks is specified for a table, queries over the table might be executed in a nonoptimal manner.

Use the Columns group box to specify cardinality for each of the columns in the table:

Table A-8 Columns group Components

Field	Description
Column name	The columns in the table.

Table A-8 (Cont.) Columns group Components

Field	Description
Cardinality	The number of distinct values for the column. If the value is -1, then the number of distinct values for the column is unknown (a value was not supplied and the update statistics utility was not run to update the value). A value of 0 indicates that there are no distinct values for the column.

Use the Indexes group box to specify cardinality for the columns in each of the indexes in the table:

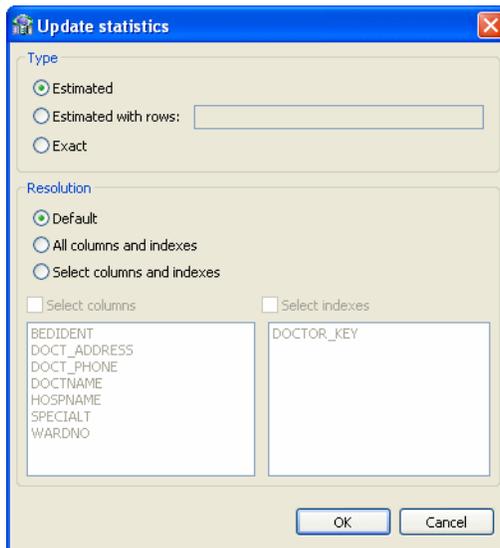
Table A-9 Indexes group Components

Field	Description
Indexes and segments	The indexes and segments in the table.
Cardinality	The number of distinct key values in the index. If the value is -1, then the number of distinct key values in the index is unknown (a value was not supplied and the update statistics utility was not run to update the value). A value of 0 indicates that there are no distinct key values in the index.

Generating Statistics

Click **Update** in the **Statistics** tab to generate updated statistics for the table. The Update Statistics screen is displayed, as shown in the following figure:

Figure A-5 The Update Statistics screen



The following tables list the fields that are used to update statistics:

Use the Type group to specify the following:

Table A–10 Type group Components

Field	Description
Estimated	An estimation of the amount of statistical information returned.
Estimated with rows	An estimation of the amount of statistical information returned. The estimate includes an estimation of the number of rows in the table. Specify the number in the text box. This number is used to shorten the time to produce the statistics, assuming that the value specified here is the correct value, or close to the correct value.
Exact	The exact statistical information returned. Note that this can be a lengthy task and can lead to disk space problems with large tables.

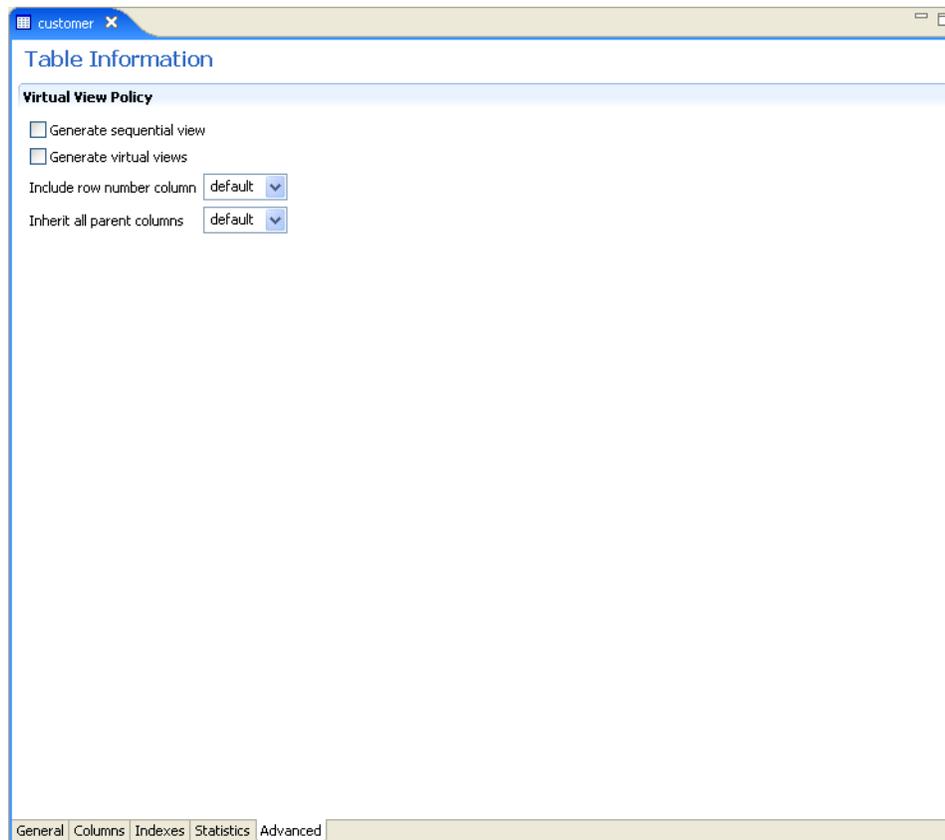
Use the Resolution group to specify the following:

Table A–11 Resolution group Components

Field	Description
Default	Only information about the table and indexes is collected. Information for partial indexes and columns is not collected.
All columns and indexes	Information about the table, indexes, partial indexes and columns is collected.
Select columns and indexes	Enables you to select the columns and indexes for which you want to collect statistics. In the enabled list of columns or indexes, left click those columns you want included (you can use shift-click and control-click to select a number of columns or indexes).

Advanced Tab

The **Advanced** tab lets you enter information about the virtual view policy for arrays. These parameters are valid only if you are using virtual array views. The configurations made in this editor are for the selected table, only. The same parameters are configured on the data source level in the data source editor.

Figure A-6 Data Source Metadata Advanced Tab

Enter the following information in this tab:

- **Generate sequential view:** Select this to map non-relational files to a single table.
- **Generate virtual views:** Select this to have individual tables created for each array in the non-relational file.
- **Include row number column:** Select one of the following:
 - **true:** Select **true**, to include a column that specifies the row number in the virtual or sequential view. This is true for this table only, even in the data source is not configured to include the row number column.
 - **false:** Select **false**, to not include a column that specifies the row number in the virtual or sequential view for this table even if the data source is configured to include the row number column.
 - **default:** Select **default** to use the default data source behavior for this parameter.
- **Inherit all parent columns:** Select one of the following:
 - **true:** Select **true**, for virtual views to include all the columns in the parent record. This is true for this table only, even in the data source is not configured to include all of the parent record columns.
 - **false:** Select **false**, so virtual views do not include the columns in the parent record for this table even if the data source is configured to include all of the parent record columns.

- **default:** Select **default** to use the default data source behavior for this parameter.

Adapter Metadata

Use Oracle Studio to maintain the metadata for your database adapter.

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Expand the **Machines** folder, then expand the machine you are working with.
3. Expand the **Bindings** folder.
4. Expand the **NAV** binding.
5. Expand the **Adapters** folder to display the adapters list.
6. Right-click the adapter, and select **Show Metadata View** to open the Metadata view.

You can create and edit the adapter metadata as follows:

- **Adapter Metadata General Properties:** Enter and edit information about the adapter, such as the adapter name and the way in which you connect to the adapter. You make these changes in the Design perspective, Metadata view.
- **Adapter Metadata Interactions:** Enter details of an interaction. The interaction Advanced tab is displayed for some adapters only, such as the Database adapter and includes more details about the interaction.
- **Adapter Metadata Schema Records:** The input and output record structure for a record in the adapter definition.

Adapter Metadata General Properties

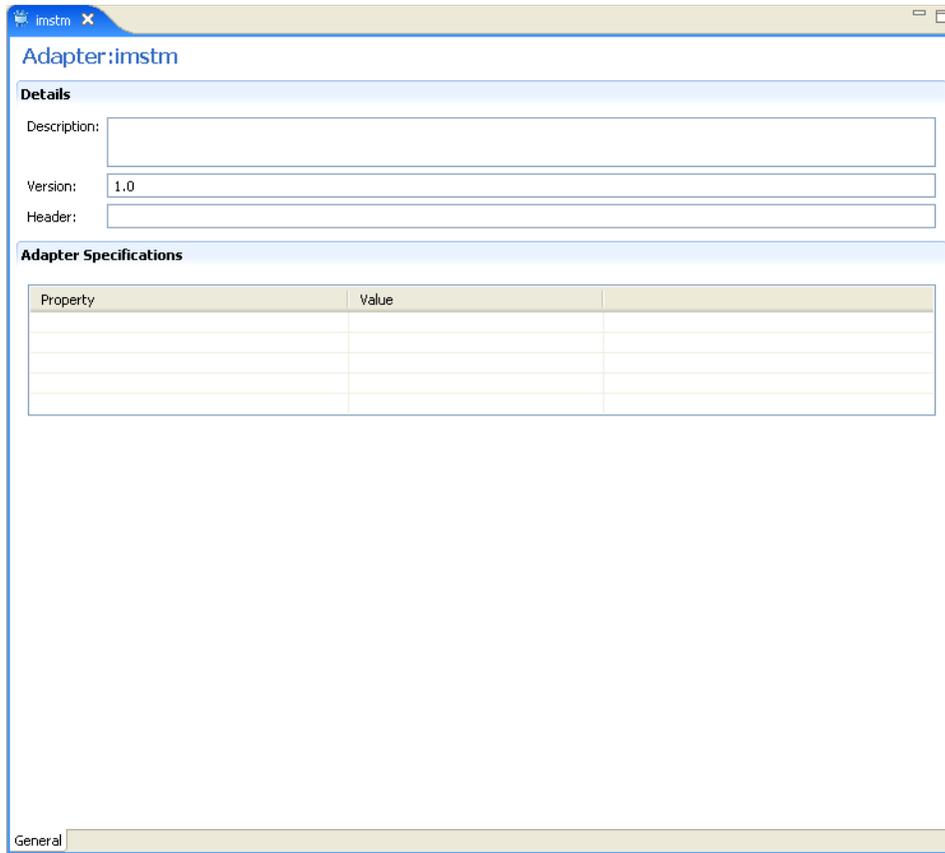
You can enter and edit information about the adapter, such as the adapter name and the way in which you connect to the adapter. You make these changes in the Design perspective, Metadata view. The following describes how to open the Adapter General Properties editor.

1. In Oracle Studio Design perspective, Metadata view, expand the **Adapters** folder.
2. Right-click the adapter that you want to edit, and select **Open**.

The General properties editor is displayed.

The Adapter General Properties editor is shown in the following figure:

Figure A-7 Adapter Metadata General Properties



The **General** properties are listed in the following table:

Table A-12 General tab Components

Field	Description
Description	Specifies an identifying description of the adapter.
Authentication mechanism	Specifies the authentication to access the adapter. The available mechanisms are: <ul style="list-style-type: none"> ■ kerbv5 ■ none ■ basic password
Max request size	Specifies the maximum size in bytes for an XML request or reply. Larger messages are rejected with an error.
Max active connections	Specifies the maximum number of simultaneous connections for an adapter (per process).
Max idle timeout	Specifies the maximum time, in seconds, that an active connection can stay idle. After that time, the connection is closed.
Adapter Specifications	Specifies the adapter-specific properties for an interaction. The IMS/DB database adapter does not have any adapter-specific properties.

Adapter Metadata Interactions

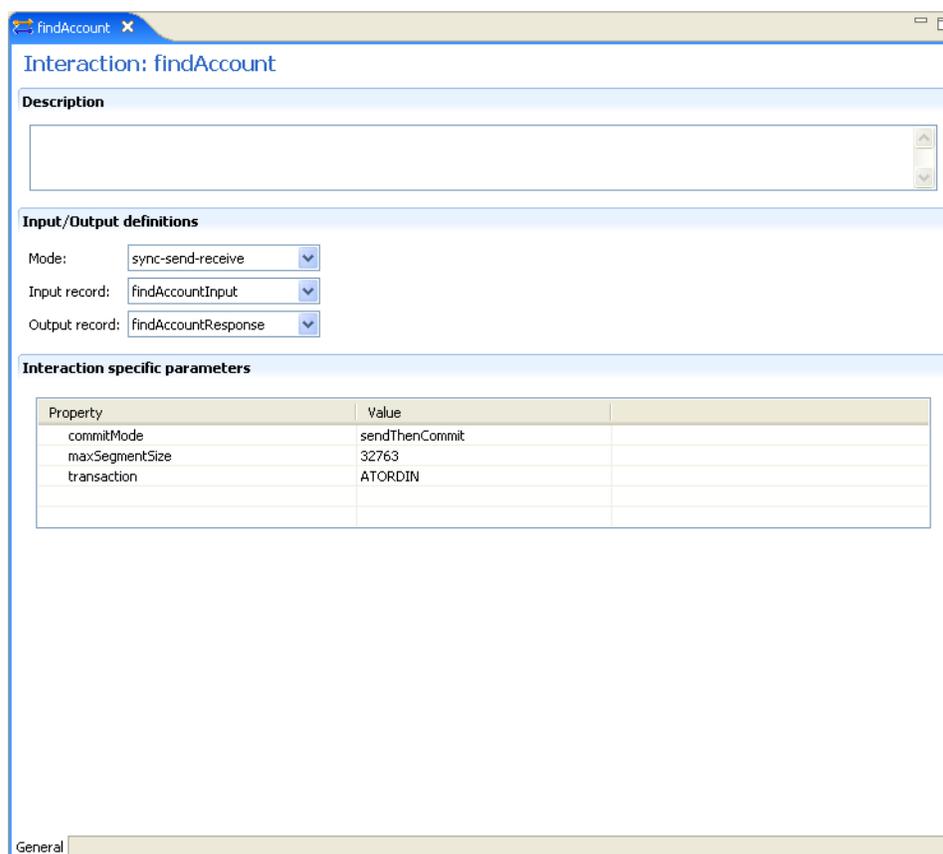
The Adapter Metadata Interactions editor defines an interaction and its input and output definitions. The following describes how to open the Adapter Metadata editor.

1. In Oracle Studio Design perspective, Metadata view, expand the **Adapters** folder.
2. Expand the adapter with the interaction that you want to edit.
3. Expand the **Adapter** folder.
4. Right-click the adapter you want to edit and select **Open**.

The Adapter Metadata Interactions editor is displayed.

The Adapter Metadata Interactions editor is shown in the following figure:

Figure A–8 Adapter Metadata Interactions



The Adapter Metadata Interaction properties are listed in the following table:

Table A–13 Interaction General Editor Components

Field	Description
Description	Provides a descriptive identifier for the interaction.

Table A–13 (Cont.) Interaction General Editor Components

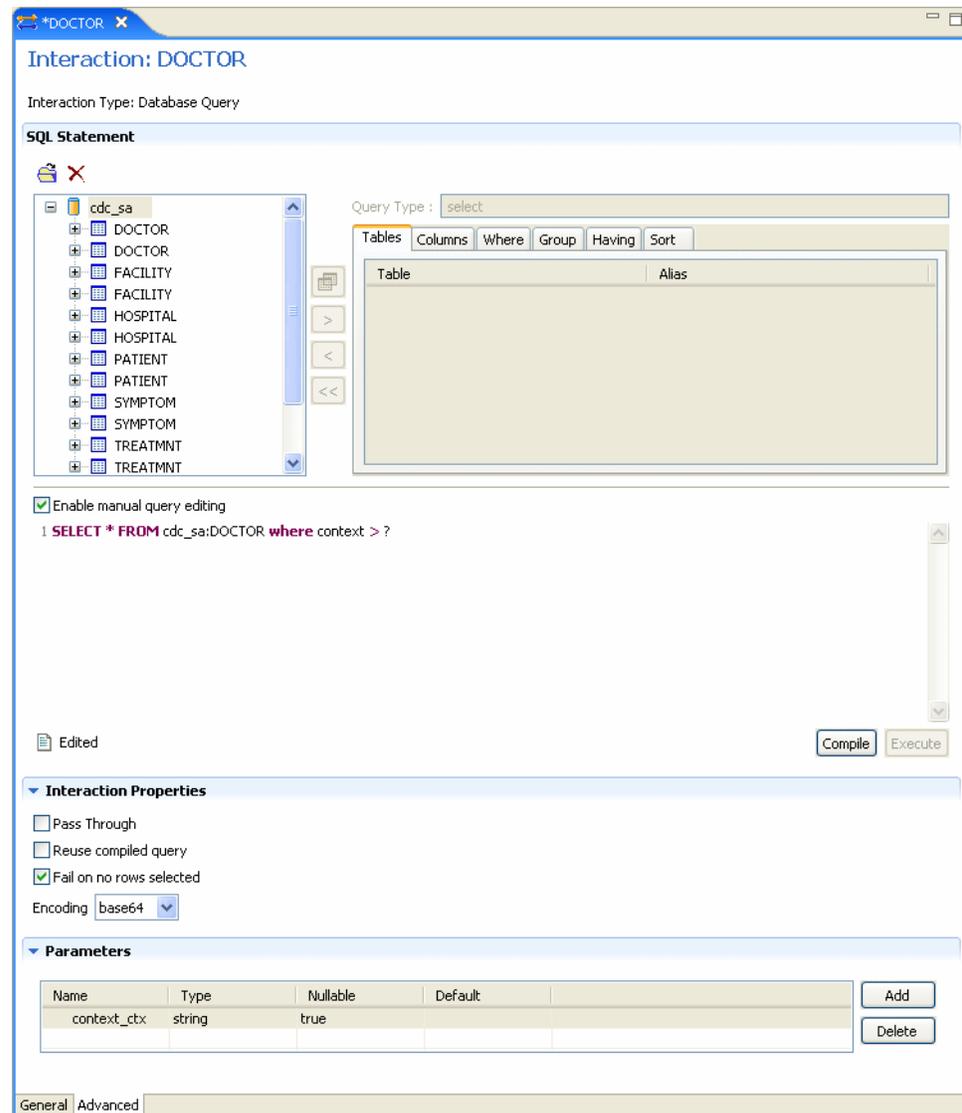
Field	Description
Mode	Determines the interaction mode. The following interaction modes are available: <ul style="list-style-type: none">■ sync-send-receive: The interaction sends a request and expects to receive a response.■ sync-send: The interaction sends a request and does not expect to receive a response.■ sync-receive: The interaction expects to receive a response.
Input record	Identifies an input record.
Output record	Identifies an output record for the results of an interaction.
Interaction Specific Parameters	Specific properties for the interaction. When an Interaction Advanced tab is used, this section is not displayed.

Interaction Advanced Tab

In the Adapter Metadata Interactions editor, click **Advanced** at the bottom of the editor to open the Interaction **Advanced** tab. Use this to enter advanced details for the interaction or to create interaction manually.

The following figure shows the Interactions **Advanced** tab.

Figure A-9 Interaction Advanced Tab



This tab has three sections.

The **SQL Statement** section lets you build any valid SQL statement. Use the tabs to select the tables and statement types and build a statement. When you select **Enable manual query editing**, you can manually enter a valid SQL statement at the bottom of the screen.

The **Interaction Properties** section lets you select any of the following:

- **Pass Through:** Select this to pass a query directly to the IMS/DB data.
- **Reuse compiled query:** Select this to save query objects created in the previous execution to the cache. This allows the objects to be reused.
- **Fail on no rows returned:** Select this if you want to the system to return an error if no rows are selected.
- **Encoding:** Select one of the following from the list:
 - **base64:** Select this for base 64 encoding

- **hex**: Select this for hexadecimal encoding

The **Parameters** section lets you create parameters to use for the interaction. To create a parameter, click **Add**. Enter a name in the dialog box and click **OK**. The parameter is entered in the list. You can edit the following properties for each parameter you create. Click in the corresponding cell to edit the properties.

- **Name**: The name of the parameter. This is automatically entered when you create a new parameter. You can click in the cell to change this parameter.
- **Type**: The type of parameter. Select one of the following types from the list:
 - **string**
 - **number**
 - **timestamp**
 - **binary**
 - **xml**
- **Nullable**: Select True or False to determine whether the parameter can be nullable.
- **Default**: Enter a default value for the parameter, which is used if the parameter attribute is missing in the input record.

Notes:

- If a field is not nullable and a default value is not supplied in the schema part of the Adapter Definition, an error occurs if the parameter attribute is missing in the input record.
 - The parameters must be entered in the same order as they are used in the SQL statement.
-
-

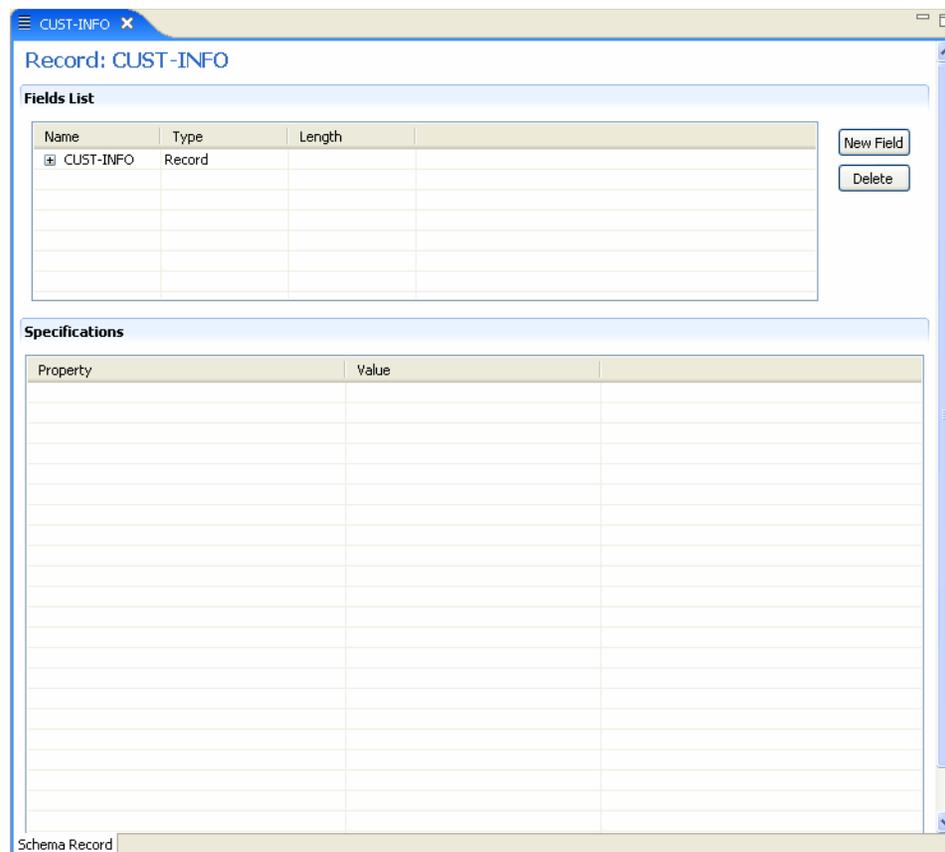
Adapter Metadata Schema Records

The Adapter Metadata Schema Records editor defines the general details of the input and output record structures for the interaction. The following describes how to open the Adapter Metadata Schema Records editor:

1. In Oracle Studio Design perspective, Metadata view, expand the **Adapters** folder.
2. Expand the adapter with the schema records that you want to edit.
3. Expand the **Schemas**.
4. Right-click the schema you want to edit and select **Open**.

The Adapter Metadata Schema Records editor is displayed.

The Adapter Metadata Schema Records editor is shown in the following figure:

Figure A–10 Adapter Metadata Schema Records

The Adapter Metadata Schema Records properties are listed in the following tables:

Table A–14 Schema Record Tab

Field	Description
Fields list	<p>Defines the single data item within a record. This section has a table with the following three columns:</p> <ul style="list-style-type: none"> ▪ Name: The name of the field ▪ Type: The data type of the field. See the Valid Data Types table for a list of the valid data types. ▪ Length: The size of the field including a null terminator, when the data type supports null termination (such as the string data type).
Specifications	<p>Defines specific field properties. To display the properties, select the specific field in the Fields list.</p>

The following table describes the valid data types that can be used when defining these specifications in the Schema Record editor.

Table A–15 Valid Data Types

Binary	Boolean	Byte
Date	Double	Enum
Float	Int	Long

Table A-15 (Cont.) Valid Data Types

Binary	Boolean	Byte
Numeric([p[,s]])	Short	String
Time	Timestamp	

Adapter Metadata XML

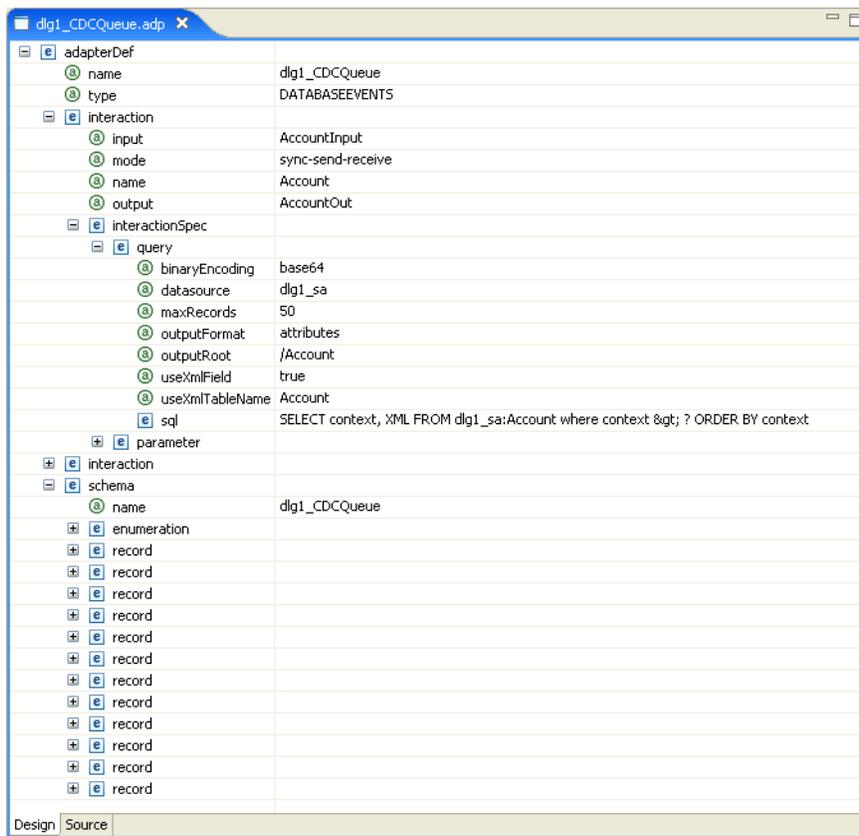
You can also edit the adapter metadata by viewing its XML schema. The following describes how to open the adapter metadata XML editor:

1. In Oracle Studio Design perspective, Metadata view, expand the **Adapters** folder.
2. Right-click the adapter that you want to edit, and select **Open as XML**.

The adapter XML editor is displayed in the Design view.

The adapter XML editor is shown in the following figure:

Figure A-11 Adapter Metadata XML Editor



For information on how to edit the properties in the XML editor Design view, see .

Back-end Adapter Data Type Support

OracleAS Adapters for IMS/DB supports a number of data types that are used when defining metadata in Oracle Studio. The data types are mapped from the COBOL data types during the import procedure.

Note: The mapping of data types between OracleAS Adapters for IMS/DB and Oracle Application Server is performed internally by Oracle Connect.

Data Type Mapping

The COBOL data type `COMP`, in the table is an abbreviation for, and synonymous with, `COMPUTATIONAL`. Square brackets ([]) denote optional qualifiers for some COBOL compilers, which may not be allowed for other COBOL compilers.

Table 8-7 Data Type Mapping: COBOL and Oracle Connect Back-end Adapter

COBOL Data Type	Oracle Connect Data Type
BINARY (with fractional data)	string
BINARY (without fractional data)	int
COMP (with fractional data)	string
COMP (without fractional data)	int
COMP-2	double
COMP-3	string
COMP-4 (with fractional data)	string
COMP-4 (without fractional data)	int
COMP-5 (with fractional data)	string
COMP-5 (without fractional data)	int
COMP-X (with fractional data)	string
COMP-X (without fractional data)	int
INDEX	int
[SIGN [IS]] LEADING	string
[SIGN [IS]] LEADING SEPARATE [CHARACTER]	string
NATIVE-2	int

Table 8-7 (Cont.) Data Type Mapping: COBOL and Oracle Connect Back-end Adapter

COBOL Data Type	Oracle Connect Data Type
NATIVE-4	int
NATIVE-8	string
PACKED-DECIMAL	string
POINTER	int
[SIGN [IS]] TRAILING	string
[SIGN [IS]] TRAILING SEPARATE [CHARACTER]	string

Advanced Tuning of the Daemon

The daemon configuration is managed using Oracle Studio. Daemon configuration is divided into the following groups:

- [Control](#)
- [Logging](#)
- [Security](#)
- [Workspaces](#)

Control

Using the **Control** tab for the daemon, you define various daemon control options. The **Daemon Control** tab is accessed as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. From the Design perspective Configuration view expand the **Machines** folder.
3. Right-click the computer and select **Open Runtime Perspective**.
4. Right-click the required daemon in the Runtime Explorer and select **Edit Daemon Configuration**. The **Control** tab for the daemon is displayed in the editor.
5. After making changes to the daemon, right-click the daemon and select **Reload Configuration**.

Note: You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.

Changes made to the daemon configuration are only implemented after the configuration is reloaded using the **Reload Configuration** option in the Runtime Manager perspective.

The **Control** tab is shown in the following figure:

Figure 8–3 The Control tab

The following table shows the parameters that can be set in the **Control** tab:

Table 8–8 Daemon Control Tab Components

Field	Description
Daemon IP Address	Enter the IP address of the machine(s) where the daemon is listening. If no IP address is entered, the daemon will listen on all available IP addresses.
Daemon port	Enter the port where the daemon is listening. If no port is entered, the daemon listens on all available ports.
Automatically recover from failure	The daemon restarts automatically if it fails for any reason (any error that causes the daemon process to terminate, such as network process lost or the CPU running the daemon crashes and the backup daemon is defined on another CPU). All available and unconnected servers are terminated and any connected servers are marked and terminated on release. Also the backup starts a backup for itself. The backup appends a new log file to the log of the original daemon, adding a line indicating that a backup daemon was started.
Maximum XML request size	The maximum number of bytes that the daemon handles for an XML document.
Default language	The language that the daemon supports. This setting is used when working with a client with a code page different from the server code page.
Maximum XML in memory	The maximum amount of space reserved for the XML in memory.

Table 8–8 (Cont.) Daemon Control Tab Components

Field	Description
Call timeout	<p>The timeout period for <i>short</i> calls for all daemons. The definition of a short call is a call that should be completed in a few seconds. For example, most calls to a database such as <code>DESCRIBE</code> should be completed in a few seconds as opposed to call like a <code>GETROWS</code> call, which can take a long time. In heavily loaded or otherwise slow systems, even short calls such as calls to open a file, may take a significant amount of time. If a short call takes more than the specified time to complete, then the connection is stopped. The default value for this parameter is 60 seconds. Values of less than 60 seconds are considered to be 60 seconds.</p> <p>Specifying the timeout in a workspace overrides the value set in this field for that workspace.</p>
Connect timeout	<p>The time the client waits for a daemon server to start. If the daemon server does not start within this period, then the client is notified that the server did not respond. The value specified for this parameter serves as the default timeout for all the workspaces listed in the daemon configuration. The default value for this parameter is 60 seconds.</p> <p>Notes:</p> <ul style="list-style-type: none"> ▪ Entering the timeout in a workspace overrides the value set in this field for that workspace. ▪ Even if the XML source does not list this parameter in the workspace section, the workspace gets it using the default value. If you want to prevent a workspace from using the default value, you must enter a value of zero for this parameter in the workspace section.
Client idle timeout	<p>The maximum amount of time any daemon client may be idle before the connection with the server is closed.</p> <p>Specifying the timeout in a Workspace overrides this setting for that workspace.</p>

Logging

Using the **Logging** tab, you define the daemon log file settings, the log file structure and the location where the log is saved. In addition, use it to define the data that is logged and traced in the file.

The following describes how to open the **Logging** tab.

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. From the Design perspective Configuration view expand the **Machines** folder.
3. Right-click a computer and select **Open Runtime Perspective**.
4. Right-click the daemon in the Runtime Explorer and select **Edit Daemon Configuration**.
5. Click the **Logging** tab.
6. After making changes to the daemon, right-click the daemon and select **Reload Configuration**.

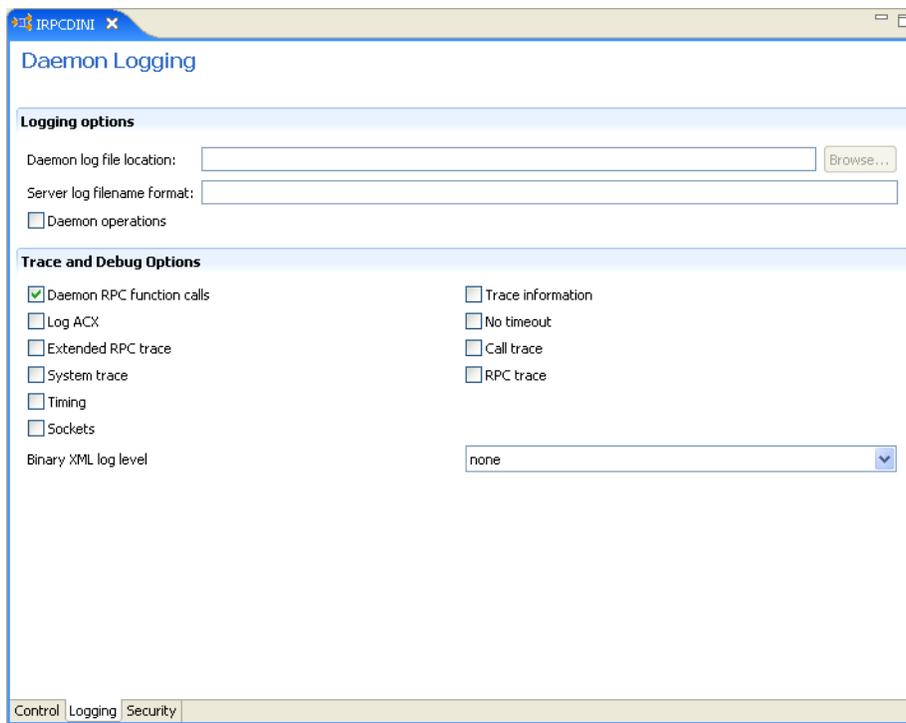
Note: You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.

Changes made to the daemon configuration are only implemented after the configuration is reloaded using the **Reload Configuration** option in the Runtime Manager perspective.

- Right-click the daemon and select **Recycle Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **Logging** tab for the daemon is shown in the following figure:

Figure 8–4 The Logging tab



The **Daemon Logging** tab comprises fields, as listed in the following table:

Table 8–9 Daemon Logging Tab Components

Field	Description
Logging options	
Daemon log file location	Specifies the daemon produces its log data. The full path must be specified.
Server log filename format	Defines the name and location of the server log file. The field must specify the full path name. If no directory information is provided for the log file, then it will be located in the login directory of the account running Oracle Connect workstation.
Daemon operations	Select this to log all of the daemon operations.

Table 8–9 (Cont.) Daemon Logging Tab Components

Field	Description
Tracing and debug options	
Daemon RPC function calls	Select this to log all daemon RPC function calls.
Log ACX	Select this if you want to log requests and processes.
Extended RPC trace	Generates a verbose message in the server log file for each low-level RPC function called. This is useful for troubleshooting the server.
System trace	Generates system-specific tracing of various operations.
Timing	Generates a timestamp for every entry to the server log file.
Sockets	Generates a message in the server log file for each socket operation.
Trace information	Select this to log low-level RPC operations.
No timeout	Disables the standard RPC timeouts, setting them to a long duration (approximately an hour) to facilitate debugging.
Call trace	Generates a message in the server log file for each RPC function called. This is useful for troubleshooting the server.
RPC trace	Enables debugging messages on the server.
Binary XML log level	Sets the binary XML log level. Your options are: <ul style="list-style-type: none"> ▪ debug ▪ none (the default) ▪ api ▪ info

The following tokens can appear in the log file template and will be replaced accordingly:

- %A: workspace name
- %D: date (yymmdd)
- %I: instance number of the given workspace server
- %L: server account login directory
- %P: server process ID
- %T: time (hhmmss)
- %U: server account name (username)

For example, %L/server_%A%I.log may produce a log file such as:
/usr/smith/server_sales15.log.

The default log file template is %L/server_%A%I.log.

Security

The following **Security** tab for the daemon is used to:

- Grant administration rights for the daemon.

- Determine access to the computer.

The following shows how to open the Daemon **Security** tab:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. From the Design perspective Configuration view expand the **Machines** folder.
3. Right-click the computer and select **Open Runtime Perspective**.
4. Right-click the daemon in the Runtime Explorer and select **Edit Daemon Configuration**.
5. Click the **Security** tab.
6. After making changes to the daemon, right-click the daemon and select **Reload Configuration**.

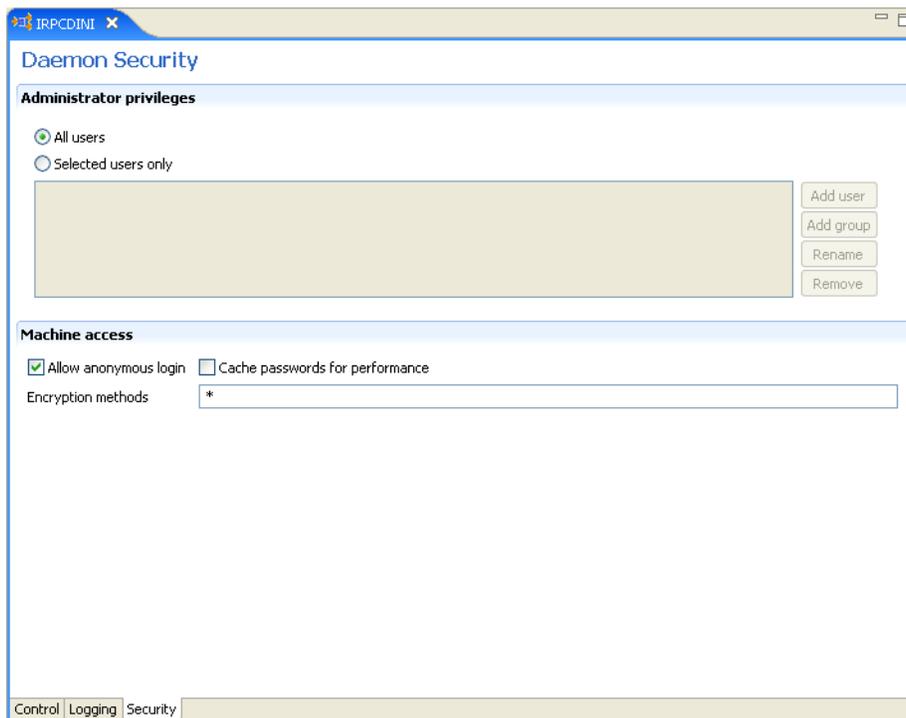
Note: You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.

Changes made to the daemon configuration are not implemented. They are only implemented after the configuration is reloaded using the **Reload Configuration** option in the Runtime Manager.

7. Right-click the daemon and select **Recycle servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The Daemon **Security** tab is shown in the following figure:

Figure 8–5 The Daemon Security tab



The **Daemon Security** tab comprises fields, as listed in the following table:

Table 8–10 Daemon Security Tab Components

Field	Description
Administrators privileges	Identifies the users (accounts) allowed to perform administrative tasks (tasks that require administrative login).
All users	Enables all users to access the daemon and change the settings.
Selected users only	Identifies the names of users (accounts) and groups that can be administrators. ¹ If a user is not specified, the account from which the daemon was started is considered the administrator. Note that the daemon does not require the user to log in to the account on the system, but to log in to the daemon using the account name and password.
Machine access	Manages access to the computer.
Allow anonymous login	Whether workspaces allow anonymous logins (without user name/password entries). For the optimal level of security, keep this option unchecked and define a username for the Daemon Administrators parameter. If unchecked, then no workspace can have an anonymous client. If checked, then a particular workspace allows anonymous clients.
Cached password	Enables login passwords to be cached. This enhances performance by reducing login times for future connections from the same client in a session.
Encryption methods	Specifies the encryption method used to send information across the network. The default is an asterisk (*), meaning that all methods are acceptable. If an encryption method is specified, it must be used. The RC4 and DES3 protocols are currently supported.

¹ The name is prefixed with '@', to utilize the operating system GROUP feature.

Workspaces

A daemon can include a number of workspaces. A workspace defines the server processes and environment that are used for the communication between the client and the server for the duration of the client request. Each workspace has its own definition. The workspace definition is divided into the following groups:

- [General](#)
- [Server Mode](#)
- [Security](#)

General

Using the **General** tab, you enter general information about the features that control the operation of the workspace, such as the server type, the command procedure used to start the workspace and the binding configuration associated with this workspace.

Do the following to open the **General** tab:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. From the Design perspective Configuration view, expand the **Machines** folder.

3. Right-click a computer and select **Open Runtime Perspective**.
4. Expand the Daemons node to display the workspaces in the Runtime Explorer.
5. Right-click the workspace and select **Edit Workspace Configuration**. The WS Info. tab opens.
6. After making changes to the workspace, right-click the daemon and select **Reload Configuration**.

Note: You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.

Changes made to the daemon configuration are not implemented. They are only implemented after the configuration is reloaded using the **Reload Configuration** option in the Runtime Manager.

7. Right-click the daemon and select **Recycle Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **General** tab is shown in the following figure:

Figure 8–6 The General tab

The **General** tab comprises fields, as listed in the following table:

Table 8–11 General Tab Components

Field	Description
Info	

Table 8–11 (Cont.) General Tab Components

Field	Description
Workspace name	The name used to identify the workspace. Note: The default configuration includes the default Navigator workspace. This workspace is automatically used if a workspace is not specified as part of the connection settings.
Description	A description of the workspace.
Startup script	The full path name of the script that starts the workspace server processes. The script specified here must always activate the <code>nav_login</code> procedure and then run the server program (<code>svc</code>). If you do not specify the directory, the startup procedure is taken from the directory where the daemon resides. Oracle Connect includes a default startup script, which it is recommended to use.
Server type	This field is not applicable for use with OracleAS Adapters for IMS/DB.
Workspace binding name	This field is not applicable for use with OracleAS Adapters for IMS/DB.
Timeout parameters	The time the client waits for the workspace server to start. If the workspace server does not start within this period, then the client is notified that the server did not respond. Specifying the timeout here overrides the default setting, specified in the Control section. See Also: Control for details about the Daemon Control section.
Client idle timeout	The maximum amount of time a workspace client can be idle before the connection with the server is closed.
Connect timeout	The time the client waits for a workspace server to start. If the workspace server does not start within this period, then the client is notified that the server did not respond.
Call timeout	The timeout period for <i>short</i> calls for all daemons. The definition of a short call is a call that should be completed in a few seconds. For example, most calls to a database such as <code>DESCRIBE</code> should be completed in a few seconds as opposed to call like a <code>GETROWS</code> call, which can take a long time. In heavily loaded or otherwise slow systems, even short calls such as calls to open a file, may take a significant amount of time. If a short call takes more than the specified time to complete, then the connection is stopped. The default value for this parameter is 60 seconds. Values of less than 60 seconds are considered to be 60 seconds. Specifying the timeout in a workspace overrides the value set in this field for that workspace.

Logging and Trace Options

Table 8–11 (Cont.) General Tab Components

Field	Description
Specific log file format	<p>Defines the name and location of the server log file if you want the data written to a file instead of SYSOUT for the server process. The parameter must specify the name and the high level qualifier.</p> <p>The following tokens can appear in the log file template and will be replaced accordingly:</p> <ul style="list-style-type: none"> ■ %A: workspace name ■ %D: date (yymmdd) ■ %I: instance number of the given workspace server ■ %L: server account's login directory ■ %P: server's process ID ■ %T: time (hhmmss) ■ %U: server's account name (username)
Trace options	<p>Specifies the type of tracing to be performed. The following tracing options are available:</p> <ul style="list-style-type: none"> ■ No timeout: Select this to disable the standard RPC timeouts, setting them to a long duration (approximately an hour) to facilitate debugging. ■ Call trace: Select this to generate a message in the server log file for each RPC function called. This is useful for troubleshooting the server. ■ RPC trace: Select this to enable debugging messages on the server. ■ Sockets: Select this to generate a message in the server log file for each socket operation. This is useful for troubleshooting client/server communication - providing a detailed trace of every client/server communication. ■ Extended RPC trace: Select this to generate a verbose message in the server log file for each low-level RPC function called. This is useful for troubleshooting the server. ■ System trace: Select this to generate operating system-specific tracing. ■ Timing: Select this to generate a timestamp for every entry to the server log file.
Query governing restrictions	
Max number of rows in a table that can be read	Select the maximum number of table rows that are read in a query. When the number of rows read from a table exceeds the number stated the query returns an error.
Max number of rows allowed in a table before scan is rejected	<p>Select the maximum number of table rows that can be scanned. This parameter has different behavior for query optimization and execution.</p> <ul style="list-style-type: none"> ■ For query optimization, the value set is compared to the table cardinality. If the cardinality is greater than the value, the scan strategy is ignored as a possible strategy (unless it is the only available strategy). ■ For query execution, a scan is limited to the value set. When the number of rows scanned exceeds the number entered, the query returns an error.

Server Mode

The Server Mode tab lets you configure the features that control the operation of the servers started up by the workspace and allocated to clients.

For example, you can configure the workspace to start up a number of servers for future use, prior to any client request, instead of starting each server when a request is received from a client.

Do the following to open the **Server Mode** tab:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. From the Design Perspective Configuration view, expand the **Machines** folder.
3. Right-click the computer and select **Open Runtime Perspective**.
4. Expand the Daemons node to display the workspaces in the Runtime Explorer.
5. Right-click the workspace and select **Edit Workspace Configuration**.
6. Click the **Server Mode** tab.
7. After making changes to the workspace, right-click the daemon and select **Reload Configuration**.

Notes:

- You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.
 - Changes made to the daemon configuration are not implemented. They are only implemented after the configuration is reloaded using the **Reload Configuration** option in the Runtime Manager.
-
-

8. Right-click the daemon and select **Recycle Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **Server Mode** tab is shown in the following figure:

Figure 8–7 The Server Mode tab

Workspace Server Mode

Server

Workspace server mode: []

Port range: From 0 To 0

Use default port range

Maximum number of server processes: 0

Limit server reuse: 50

Limit concurrent clients per server: 0

Specify server priority: 0

Use default server priority

Keep when daemon ends

Server Provisioning

Number of prestarted servers in pool: 0

Number of spare servers: 0

Prestarted server pool limit: 0

Resource limitations

Number of sub-tasks (OS/390 specific): 0

General | **Server Mode** | Security

The **Server Mode** tab has the following fields:

Table 8–12 Server Mode Tab Components

Field	Description
Workspace server mode	<p>Specifies the type of new server processes that the daemon starts up. The daemon supports the following server modes:</p> <ul style="list-style-type: none"> ■ <code>singleClient</code>: Each client receives a dedicated server process. The account in which a server process runs is determined either by the client login information or by the specific server workspace. <p>This mode enables servers to run under a particular user account and isolates clients from each other, as each receives its own process. However, this server mode incurs a high overhead due to process startup times and can use a lot of server resources as it requires as many server processes as concurrent clients.</p> ■ <code>multiClient</code>: Clients share a server process and are processed serially. This mode has low overhead because the server processes are already initialized. However, because clients share the same process, they can impact one another, especially if they issue lengthy queries. The number of clients that share a process is determined by the Clients per server limit field. ■ <code>multiThreaded</code>: This mode is not applicable for use with OracleAS Adapter for IMS/DB. ■ <code>reusable</code>: An extension of single-client mode. Once the client processing finishes, the server process does not die and can be used by another client, reducing startup times and application startup overhead. <p>This mode does not have the high overhead of single-client mode because the servers are already initialized. However, this server mode can use a lot of server resources as it requires as many server processes as concurrent clients.</p> <p>Note: The other modes can be set so that the server processes are reusable. The number of times a process can be reused is controlled by the Reuse limit field value.</p>
Reuse limit	<p>Sets the maximum number of times a particular server can be reused. A one-client server can be reused after its (single) client has disconnected. Reuse of servers enhances startup performance because it avoids the need to repeat initialization. The default for this field is none (0), indicating that server reuse is unlimited. This parameter is disabled only if the server mode value is <code>singleClient</code>.</p>
Clients per server limit	<p>Sets the maximum number of clients a server process for the current workspace accepts. The default for this field is none (0), indicating that the number of clients for each server is unlimited. This field is enabled only if the server mode value is <code>multiClient</code> or <code>multiThreaded</code>.</p>

Table 8–12 (Cont.) Server Mode Tab Components

Field	Description
Server availability	<p data-bbox="610 268 1154 323">Specifies the number of servers in a pool of servers, available to be assigned to a client.</p> <p data-bbox="610 333 992 363">The following options are available:</p> <ul data-bbox="610 373 1227 1339" style="list-style-type: none"> <li data-bbox="610 373 1227 583">■ Initial number of servers: The number of server processes that are prestarted for this workspace when the daemon starts up. When the number of available server processes drops lower than the value specified in the Minimum number field, the daemon again starts server processes until this number of available server processes is reached. The default for this field is 0. <li data-bbox="610 594 1227 804">■ Minimum number: The minimum number of server processes in the prestarted pool before the daemon resumes creating new server processes (to the value specified in the Initial number of servers field). If this field is set to a value higher than the Initial number of servers field, the daemon uses the value specified in the Initial number of servers field. The default for this field is 0. <li data-bbox="610 814 1227 1066">■ Keep when daemon ends: When a daemon is shutdown, all the servers started by that daemon are also killed, even if they are active. Set this field to <code>true</code> if you want the servers for the workspace to remain active, even after the daemon has been shut down. If this field is set to <code>true</code>, it is the responsibility of the system operator or manager to ensure that the servers are eventually killed. This must be done at the system level. <li data-bbox="610 1077 1227 1339">■ Set maximum number of servers: The maximum number of available server processes. Once this number is reached, no new nonactive server processes are created for the particular workspace. For example, if a number of server processes are released at the same time, so that there are more available server processes than specified by this field, the additional server processes higher than this value are terminated. The default for this field is zero, meaning that there is no maximum.
Port range	<p data-bbox="610 1360 1227 1465">the workspace. Determines the range of ports available for this workspace when starting server processes. Use this option when you want to control the port number, so that Oracle Connect can be accessed through a firewall.</p> <p data-bbox="610 1476 1068 1505">Enter the port range in the following fields:</p> <ul data-bbox="610 1516 1227 1591" style="list-style-type: none"> <li data-bbox="610 1516 1227 1545">■ From: enter the lowest numbered port in the range. <li data-bbox="610 1556 1227 1591">■ To: Enter the highest numbered port in the range.
Use default port range	<p data-bbox="610 1602 1227 1686">Select this to use the port range that is defined in the daemon. This is defined in the Port range for servers field in the daemon Control tab.</p>
Maximum number of server processes	<p data-bbox="610 1696 1227 1759">Enter the maximum number of server processes that can run at the same time.</p>
Limit server reuse	<p data-bbox="610 1770 1227 1854">Select this if you want to limit the number of servers that can be reused. If this is selected, the Reuse limit parameter is available.</p>

Table 8–12 (Cont.) Server Mode Tab Components

Field	Description
Limit concurrent clients per server	<p>If Limit server reuse is selected, in the field next to the check box, enter the maximum number of times a server can be reused. Select the maximum of clients accepted in a server process.</p> <p>A one-client server can be reused after its (single) client has disconnected. Reuse of servers enhances startup performance because it avoids the need to repeat initialization.</p> <p>This parameter is not available if the Limit server reuse parameter is not selected.</p> <p>This parameter is not available if the server mode value is singleClient.</p> <p>Select this to limit the number of clients that a server can accept for the current workspace process.</p> <p>If this is not selected, the number of clients is unlimited.</p>
Specify Server Priority	<p>If Limit concurrent clients per server is selected, in the field next to the check box, enter the maximum number of clients that a server process for the current workspace accepts. The default for this field is None, indicating that the number of clients for each server is unlimited. This field is available if the server mode value is multiClient or multiThreaded.</p> <p>Set the priority for servers. For example, a workspace for applications with online transaction processing can be assigned a higher priority than a workspace that requires only query processing. The lower the number, the higher the priority. For example, workspaces with a priority of 1 are given a higher priority than workspaces with a priority of 2.</p> <p>Note: This is unavailable if Use default server priority is selected.</p>
Use default server priority	<p>Sets the priority to 0. There is no specific priority for this workspace. Clear this check box to set a priority in the Specify server priority parameter.</p>
Keep when daemon ends	<p>Select this to kill all servers started by that daemon when a daemon is shutdown, even if they are active. Select this if you want the servers for the workspace to remain active, even after the daemon has been shut down. If selected, it is the responsibility of the system operator or manager to ensure that the servers are eventually killed. This must be done at the system level.</p>
Server Provisioning	
Number of prestarted servers in pool	<p>Initial number of servers: The number of server processes that are prestarted for this workspace when the daemon starts up. When the number of available server processes drops lower than the value specified in the Minimum number field, the daemon again starts server processes until this number of available server processes is reached. The default for this field is 0.</p>

Table 8–12 (Cont.) Server Mode Tab Components

Field	Description
Number of spare servers	The minimum number of server processes in the prestarted pool before the daemon resumes creating new server processes (to the value specified in the Initial number of servers field). If this field is set to a value higher than the Initial number of servers field, the daemon uses the value specified in the Initial number of servers field. The default for this field is 0.
Prestarted server pool limit	The maximum number of available server processes. Once this number is reached, no new nonactive server processes are created for the particular workspace. For example, if a number of server processes are released at the same time, so that there are more available server processes than specified by this field, the additional server processes higher than this value are terminated. The default for this field is zero, meaning that there is no maximum.
Resource limitations	
Nuber of sub-tasks	The number of sub-tasks for a server that are prestarted for this workspace when the daemon starts up. In addition to setting up a pool of server processes as described earlier, you can set additional server processes as sub-tasks by specifying this parameter. If you set 10 servers and 10 prestarted sub-tasks then 100 tasks are started (10 sub-tasks for each process).

Security

The **Security** tab lets you configure the security level for a workspace. This lets you set the security options for the workspace only. The Security tab is used to:

- Grant administration rights for the workspace
- Determine access to the workspace by a client

Do the following to open the **Security** tab:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. From the Design Perspective Configuration view, expand the **Machines** folder.
3. Right-click the computer and select **Open Runtime Perspective**.
4. Expand the Daemons node to display the workspaces in the Runtime Explorer.
5. Right-click the workspace and select **Edit Workspace Configuration**.
6. Click the **Security** tab.
7. After making changes to the workspace, right-click the daemon and select **Reload Configuration**.

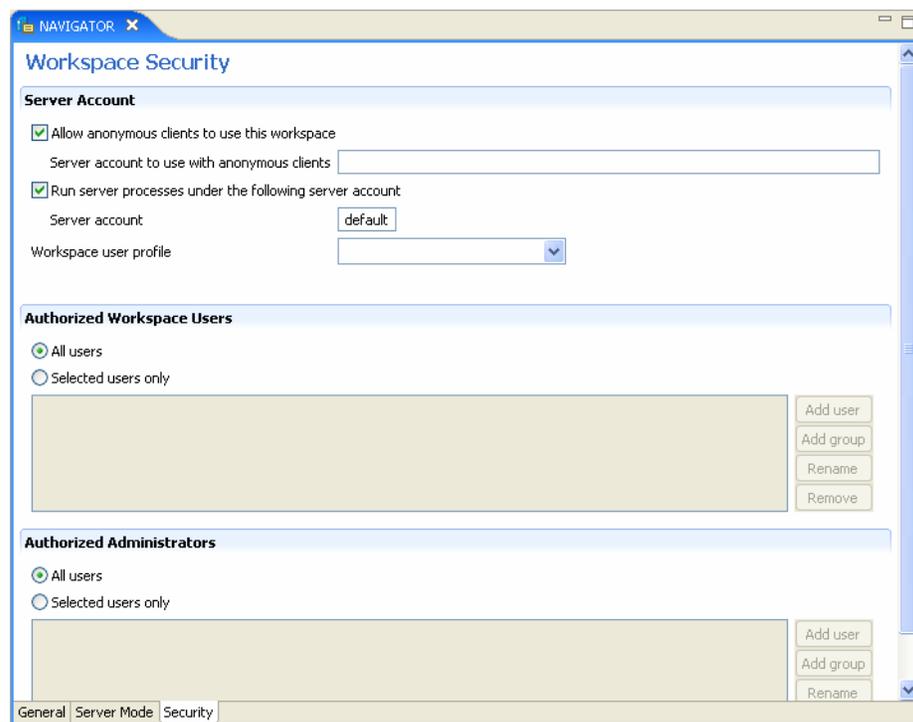
Notes:

- You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.
- Changes made to the daemon configuration are not implemented. They are only implemented after the configuration is reloaded using the **Reload Configuration** option in the Runtime Manager.

8. Right-click the daemon and select **Recycle Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **Security** tab is shown in the following figure:

Figure 8–8 The Security Tab



The **Security** tab has the following fields:

Table 8–13 Security Tab

Field	Description
Server Account	This section defines the users (accounts) allowed to access the workspace, firewall access ports, workspace account, and anonymous login permissions.
Use specific workspace account	<p>Select this if you want to define the operating system account used for the workspace.</p> <p>If selected, enter the name of the workspace account in the workspace account field.</p> <p>If not selected, the account name that was provided by the client is used.</p>
Allow anonymous clients to use this workspace	<p>Select this if you want to allow this workspace to be invoked without authentication.</p> <p>If selected, enter the name of the workspace account in the Server account to use with anonymous clients field.</p>
Authorized Workspace users	<p>Indicate which users have permission to use the workspace. Select one of the following</p> <ul style="list-style-type: none"> ■ All users: Any user who has logged on to the daemon may use the workspace ■ Selected users only: Select this to allow only users (or accounts) with specific permission to use the workspace. <p>When this is selected, add the names of users (or accounts) and groups that can be use the workspace in the field below.</p> <p>Note: If no user is specified, any user who has logged on to the daemon may use the workspace.</p>
Authorized Administrators	<p>Identifies the users (accounts) with administrator privileges. Select one of the following:</p> <ul style="list-style-type: none"> ■ All users: Indicates that anyone can access the workspace and change the settings. ■ Selected users only: Select this to allow only users (or accounts) with specific permission to be administrators. <p>When this is selected, add the names of users (or accounts) and groups that can be workspace administrators.</p> <p>If no user is specified, any user who has logged on to the daemon may administrator this workspace.</p>

Supported SQL Syntax and SQL Enhancements

OracleAS Adapter for IMS/DB provides basic support for standard ANSI '92 SQL along with a number of enhancements, all of which can be used when specifying adapter interactions.

This appendix contains the following sections:

- [Supported SQL Statements](#)
- [Supported Operators](#)
- [Supported Functions](#)
- [SQL Enhancements](#)

Supported SQL Statements

OracleAS Adapter for IMS/DB supports SELECT, DELETE, INSERT, and UPDATE statements, when specified in interactions.

Supported Operators

OracleAS Adapter for IMS/DB enables the use of the following operators in SQL statements:

- [Arithmetic Operators](#)
- [Comparison Operators](#)

Table D-1 Arithmetic Operators

Operator
+
-
*
/

Table D-2 Comparison Operators

Operator
=

Table D–2 (Cont.) Comparison Operators

Operator
>
<
>=
<=
<>, !=, ^=
IS NOT NULL
IS NULL

Supported Functions

OracleAS Adapter for IMS/DB enables the use of the following functions in SQL statements:

- [String Functions](#)
- [Group Functions](#)
- [Mathematical Functions](#)

Table D–3 String Functions

Oracle Function	Oracle Connect Function	Usage	Comment
		<i>str1</i> <i>str2</i>	Returns a string consisting of <i>str1</i> concatenated with <i>str2</i>
Ascii	Ascii	Ascii(<i>c</i>)	Returns the ASCII value of <i>c</i>
Chr	Chr	Chr(<i>ascii</i>)	Returns the character corresponding to the given ASCII value
Instr	Position	Position(<i>str2</i> , <i>str1</i>)	Returns an index in <i>str2</i> to the first occurrence of <i>str1</i> in <i>str2</i>
Length	Length	Length(<i>str</i>)	Returns the number of bytes of <i>str</i>
Lower	Lower	Lower(<i>str</i>)	Returns <i>str</i> in lowercase
Lpad	Lpad	Lpad(<i>str</i> , <i>n</i>)	Returns <i>str</i> with <i>n</i> leading blanks
Ltrim	Ltrim	Ltrim(<i>str</i>)	Returns <i>str</i> with leading blanks removed
Rpad	Rpad	Rpad(<i>str</i> , <i>n</i>)	Returns <i>str</i> with <i>n</i> trailing blanks
Rtrim	Rtrim	Rtrim(<i>str</i>)	Returns <i>str</i> with trailing blanks removed
Substr	Substr	Substr(<i>str</i> , <i>n</i> [, <i>m</i>])	Returns a substring of <i>str</i> , starting with the <i>n</i> th character and <i>m</i> characters in length, or until the end of the string if <i>m</i> is not supplied
Upper	Upper	Upper(<i>str</i>)	Returns <i>str</i> in uppercase

Table D–4 Group Functions

Oracle Function	Oracle Connect Function	Usage	Comment
Avg	Avg	Avg(<i>exp</i>)	Returns the average value of the expression <i>exp</i>
Count	Count	Count(<i>exp</i>)	Returns the count of the expression <i>exp</i>

Table D–4 (Cont.) Group Functions

Oracle Function	Oracle Connect Function	Usage	Comment
Max	Max	Max(<i>exp</i>)	Returns the maximum value of the expression <i>exp</i>
Min	Min	Min(<i>exp</i>)	Returns the minimum value of the expression <i>exp</i>
Sum	Sum	Sum(<i>exp</i>)	Returns the summation of the expression <i>exp</i>

Table D–5 Mathematical Functions

Oracle Function	Oracle Connect Function	Usage	Comment
Abs	Abs	Abs(<i>n</i>)	Returns the absolute value of <i>n</i>
Ceil	Ceil	Ceil(<i>n</i>)	Returns <i>n</i> rounded up to the closest integer
Cos	Cos	Cos(<i>n</i>)	Returns the cosine value of <i>n</i>
Exp	Exp	Exp(<i>n</i>)	Returns the exponential value of <i>n</i>
Floor	Floor	Floor(<i>n</i>)	Returns <i>n</i> rounded down to the closest integer
Ln	Ln	Ln(<i>n</i>)	Returns the natural log value of <i>n</i>
Log	Log	Log(<i>n</i>)	Returns the log value of <i>n</i>
Mod	Mod	Mod(<i>n</i> , <i>m</i>)	Returns the integer value after dividing <i>n</i> by <i>m</i>
Nvl	Nvl	Nvl(<i>exp1</i> , <i>exp2</i>)	Returns <i>exp2</i> when <i>exp1</i> is null
Power	Power	Power(<i>n</i> , <i>m</i>)	Returns <i>n</i> to the power of <i>m</i>
Round	Round	Round(<i>n</i> , <i>m</i>)	Returns <i>n</i> with the fractional part rounded to <i>m</i> digits
Sin	Sin	Sin(<i>n</i>)	Returns the sine value of <i>n</i>
Sqrt	Sqrt	Sqrt(<i>n</i>)	Returns the square root of <i>n</i>
Tan	Tan	Tan(<i>n</i>)	Returns the tangent value of <i>n</i>
Trunc	Trunc	Trunc(<i>n</i> , <i>m</i>)	Returns the absolute value of <i>n</i>

SQL Enhancements

You can incorporate the following SQL enhancements into the adapter interactions to handle hierarchical data in IMS/DB.

- [Generating Hierarchical Results](#)
- [Accessing Hierarchical Data Using SQL](#)
- [Flattening Hierarchical Data Using SQL](#)

Generating Hierarchical Results

A hierarchical query nests a SELECT statement as one of the columns of the rowset retrieved by a nested SELECT statement.

Use braces ({}) to delimit the nesting.

Accessing Hierarchical Data Using SQL

Data stored hierarchically in a IMS/DB data source can be referenced by using a hyphen followed by a right arrow (->) to denote the parent child relationship in the source:

```
FROM ... parent_name->child1->child2... [alias]
```

Or, using an alias for the parent table:

```
FROM ... parent_alias->child1->child2... [alias]
```

Flattening Hierarchical Data Using SQL

You can produce a flattened view of hierarchical data by embedding a SELECT statement inside the list of columns to be retrieved by another SELECT statement. You use parentheses to delimit the nesting. The nested SELECT statement can reference a child rowset (using the parent->child syntax) only in its FROM clause.

Using an Alias

To list the hierarchical data with the parent data only, you must use an alias for the child data.

Note: Without an alias the query lists, for each parent row, all of the children of all of the parent rows.

Globalization Settings

The OracleAS CDC Adapter for IMS/DB provides the globalization support for the following languages:

- Arabic
- English (the default)
- French
- German
- Greek
- Hebrew
- Italian
- Japanese
- Korean
- Portuguses
- Simple Chinese
- Spanish
- Traditional Chinese
- Turkish

This appendix describes how to define the language support.

Defining the Language and Codepage

The language and codepage parameters are accessed from the computer where Oracle Studio is installed.

Perform the following steps to define the required language and codepage:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. In the Design perspective **Configuration** view, expand the **Machines** folder.
3. Expand the machine for which you want to set the language.
4. Expand the Bindings folder and right-click the **NAV** binding.
5. Select **Open**.
6. Expand the **Language Settings** and do the following:

- From the **Language** list, select the NLS supported language to use in this binding. Valid values are listed in the Language Name column of [NLS Language Codes](#) table.
- From the **Codepage** list, select the codepage that you want to use with this language. The code pages available are determined by the Language that is selected. If you have additional code pages available, you can manually enter them in this field.

Note: If you change the language, the code page will also change. Check to be sure that you want to use the selected code page with the language you selected.

If no codepage is selected, the default codepage for the selected language is used.

- From the **NLS string** list, select the NLS string for this language and code page. The NLS strings available are determined by the code page that is selected. If you have additional NLS strings available, you can manually enter them in this field.

The codepage is used by a field with a data type defined as `nlsString`. This parameter is used for a field with a codepage that is different than the machine's codepage. This property includes values for the name of the codepage and whether the character set reads from right to left (as in middle-eastern character sets).

For example, the following specifies a Japanese EUC 16-bit codepage:

```
<misc nlsString="JA16EUC,false"/>
```

7. Save the change. New servers will use the language selected.

The following table lists the codepages:

Table 8–14 NLS Language Codes

Language Name	Language Code	Windows Default	ASCII Platforms (Default)	EBCDIC Platforms (Default)	Alternative Codepages (EBCDIC based unless noted otherwise)
English US	ENUS	Windows-1252	ISO-8859-15	IBM1140	IBM285, IBM500, IBM1148, IBM1047, ISO-8859-1 (ASCII based)
English UK	ENUK	Windows-1252	ISO-8859-15	IBM1146	IBM285, IBM037, IBM500, IBM1140, IBM1148, IBM1047, ISO-8859-1 (ASCII based)

Table 8–14 (Cont.) NLS Language Codes

Language Name	Language Code	Windows Default	ASCII Platforms (Default)	EBCDIC Platforms (Default)	Alternative Codepages (EBCDIC based unless noted otherwise)
French	FRE	Windows-1252	ISO-8859-15	IBM1147	IBM297, IBM037, IBM500, IBM1140, IBM1148, IBM1047, ISO-8859-1 (ASCII based)
Latin International	LAT	Windows-1252	ISO-8859-15	IBM1148	IBM500, IBM037, IBM1140, IBM1047, ISO-8859-1 (ASCII based)
Spanish	SPA	Windows-1252	ISO-8859-15	IBM1145	IBM284, IBM037, IBM500, IBM1140, IBM1148, IBM1047, ISO-8859-1 (ASCII based)
German	GER	Windows-1252	ISO-8859-15	IBM1141	IBM273, IBM037, IBM500, IBM1140, IBM1148, IBM1047, ISO-8859-1 (ASCII based)
Portuguese	POR	Windows-1252	ISO-8859-15	IBM1140	IBM037, IBM500, IBM1148, IBM1047, ISO-8859-1 (ASCII based)
Italian	ITL	Windows-1252	ISO-8859-15	IBM1144	IBM280, IBM037, IBM500, IBM1140, IBM1148, IBM1047, ISO-8859-1 (ASCII based)
Greek	GRK	Windows-1253	ISO-8859-7	IBM875	-
Russian ¹	RUS	Windows-1251	ISO-8859-5	IBM1154	IBM1025

Table 8–14 (Cont.) NLS Language Codes

Language Name	Language Code	Windows Default	ASCII Platforms (Default)	EBCDIC Platforms (Default)	Alternative Codepages (EBCDIC based unless noted otherwise)
Turkish ²	TUR	Windows-1254	ISO-8859-9	IBM1155	IBM1026
Hebrew	HEB	Windows-1255	ISO-8859-8	IBM424	IBM 862
Arabic	ARA	Windows-1256	ISO-8859-6	IBM420	
Japanese	JPN	SJIS	SJIS	IBM939	EUC-JP=EUC, VMS-JP
Chinese - Simplified	SCHI	GBK	GBK	IBM935	-
Chinese - Traditional	TCHI	BIG5	BIG5	IBM937	-
Korean	KOR	MS949	EUC-KR	IBM933	MS949

¹ Russian users who use ANSI 1251 Cyrillic as their Windows codepage must edit the `RUS.TXT` file and compile it to `RUS.CP` using the `NAV_UTIL CODEPAGE`.

² To work with solutions in Oracle Studio, when using Turkish, add the `-nl en` switch to the Target path in the Oracle Studio shortcut properties. For example: `"C:\Program Files\Oracle\Studio1\studio.exe -nl en"`

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