

Oracle® Application Server

Adapter for VSAM User's Guide

10g Release 3 (10.1.3.1.0)

B31002-01

March 2007

Oracle Application Server Adapter for VSAM User's Guide, 10g Release 3 (10.1.3.1.0)

B31002-01

Copyright © 2006, 2007, Oracle. All rights reserved.

Primary Author: Jeanne Wiegelmann

Contributing Authors: Yishai Hadas, Dror Harari, Adeeb Massad, Meera Srinivasan, Bo Stern, Shashi Suravarapu, Costi Zaboura, Sheela Vasudevan, Marian Jones

The Programs (which include both the software and documentation) contain proprietary information; they are provided under a license agreement containing restrictions on use and disclosure and are also protected by copyright, patent, and other intellectual and industrial property laws. Reverse engineering, disassembly, or decompilation of the Programs, except to the extent required to obtain interoperability with other independently created software or as specified by law, is prohibited.

The information contained in this document is subject to change without notice. If you find any problems in the documentation, please report them to us in writing. This document is not warranted to be error-free. Except as may be expressly permitted in your license agreement for these Programs, no part of these Programs may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose.

If the Programs are delivered to the United States Government or anyone licensing or using the Programs on behalf of the United States Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the Programs, including documentation and technical data, shall be subject to the licensing restrictions set forth in the applicable Oracle license agreement, and, to the extent applicable, the additional rights set forth in FAR 52.227-19, Commercial Computer Software--Restricted Rights (June 1987). Oracle USA, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

The Programs are not intended for use in any nuclear, aviation, mass transit, medical, or other inherently dangerous applications. It shall be the licensee's responsibility to take all appropriate fail-safe, backup, redundancy and other measures to ensure the safe use of such applications if the Programs are used for such purposes, and we disclaim liability for any damages caused by such use of the Programs.

Oracle, JD Edwards, PeopleSoft, and Siebel are registered trademarks of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

The Programs may provide links to Web sites and access to content, products, and services from third parties. Oracle is not responsible for the availability of, or any content provided on, third-party Web sites. You bear all risks associated with the use of such content. If you choose to purchase any products or services from a third party, the relationship is directly between you and the third party. Oracle is not responsible for: (a) the quality of third-party products or services; or (b) fulfilling any of the terms of the agreement with the third party, including delivery of products or services and warranty obligations related to purchased products or services. Oracle is not responsible for any loss or damage of any sort that you may incur from dealing with any third party.

Contents

Preface	vii
Audience	vii
Documentation Accessibility	vii
Related Documents	viii
Conventions	viii
1 Introduction	
OracleAS Adapter for VSAM Overview	1-1
VSAM Data	1-2
Accessing VSAM Data	1-2
OracleAS Adapter for VSAM Architecture	1-2
Integration Flow from Oracle Application Server to the Legacy Application	1-3
2 Installing and Configuring OracleAS Adapter for VSAM	
Preinstallation Tasks	2-1
IBM OS/390 or z/OS Hardware and Software Requirements	2-1
Hardware Requirements	2-1
Software Requirements	2-2
Windows Hardware and Software Requirements	2-2
Hardware Requirements	2-2
Software Requirements	2-2
Installing Oracle Connect on an IBM OS/390 or z/OS Series Platform	2-3
Installation Worksheet	2-3
Preinstallation Instructions	2-4
Importing the Installation Kit	2-5
Installation Instructions	2-5
Postinstallation Instructions	2-9
Postinstallation Procedures	2-9
Starting the Daemon	2-10
Setting Up Oracle Connect for Reentrancy	2-11
Setting Up Oracle Connect to Update VSAM Data	2-11
Updating an Existing Oracle Connect Installation with VSAM	2-12
Installing Oracle Studio	2-13
Installing Oracle Studio from the CD-ROM	2-13
Configuring Oracle Connect	2-14

Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio	2-14
Securing Access to Oracle Connect	2-15
Setting Password Access to Oracle Studio	2-15
Specifying Users with Administrative Rights	2-16
Setting Up Run-Time User Access to the IBM OS/390 or z/OS Platform	2-17
Modeling Interactions for OracleAS Adapter for VSAM.....	2-18
Setting Up the VSAM Data Source.....	2-18
Importing Metadata for the VSAM Data Source.....	2-21
Setting Up an Oracle Connect Adapter	2-29
Generating Outbound Interactions	2-31
Viewing the XML Schema.....	2-34
Creating XML Schemas	2-34

3 Deployment and Integration with the Oracle OC4J Container

Integrating OracleAS Adapter for VSAM with OC4J.....	3-1
Configuring the J2CA 1.5 VSAM Adapter	3-2
Using the CCI API to Develop Applications	3-3
Configuring Multiple Adapters	3-4
Updating Configuration Information	3-4

4 Troubleshooting OracleAS Adapter for VSAM

Troubleshooting the Daemon	4-1
Starting the Daemon	4-1
Task: Starting the Daemon	4-1
Shutting Down the Daemon.....	4-2
Monitoring the Daemon During Run Time.....	4-2
Daemon (Computer) Options	4-2
Workspace Options	4-3
Server Options.....	4-4
Daemon Logs	4-4
The Daemon Log Monitor	4-5
The Workspace Log Monitor.....	4-5
The Server Log Monitor	4-5
Resolving Communication Errors.....	4-5
Resolving Specific Errors.....	4-6

5 Advanced Features of OracleAS Adapter for VSAM

Configuring the Daemon for High Availability	5-1
Adding a New Daemon Workspace Configuration.....	5-1
Editing the Workspace	5-2
Configuring the Server Mode.....	5-2
Configuring a Binding Environment	5-4
comm Category	5-5
debug Category	5-5
miscellaneous Category	5-6
odbc Category	5-7

oledb Category	5-7
optimizer Category	5-7
queryProcessor Category.....	5-8
transactions Category	5-9
tuning Category.....	5-9
Migration Considerations.....	5-10
Security Considerations	5-11
Setting Design Time Security	5-11
Setting Run Time Security	5-11
Transaction Support.....	5-12

A Advanced Tuning of the Metadata

Metadata for the VSAM Data Source.....	A-1
General Tab	A-1
Columns Tab.....	A-3
Indexes Tab	A-5
Statistics Tab	A-6
Generating Statistics	A-7
Source Tab	A-8
Metadata for the Back-end Adapter.....	A-8
General Tab	A-9
Interaction General Tab.....	A-10
Interaction Advanced Tab	A-11
Schema General Tab	A-12
Schema Record Tab.....	A-13
Source Tab	A-14

B Back-end Adapter Data Type Support

Data Type Mapping	B-1
-------------------------	-----

C Advanced Tuning of the Daemon

Daemon Control	C-1
Daemon Logging	C-3
Daemon Security	C-5
Workspaces	C-7
WS Info.	C-7
WS Server	C-9
WS Logging.....	C-13
WS Security	C-16

D Supported SQL Syntax and SQL Enhancements

Supported SQL Statements	D-1
Supported Operators	D-1
Supported Functions.....	D-2
SQL Enhancements	D-3

Generating Hierarchical Results	D-3
Accessing Hierarchical Data Using SQL.....	D-4
Flattening Hierarchical Data Using SQL	D-4
Using an Alias	D-4

E Globalization Settings

Defining the Language and Codepage.....	E-1
---	-----

Index

Preface

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

This document describes the features of OracleAS Adapters for VSAM that apply to the UNIX, Windows 2000, Windows XP, and Windows Server 2003 operating systems.

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 VSAM
- Diagnosing errors
- Using OracleAS to access VSAM 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 VSAM.

Documentation Accessibility

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

<http://www.oracle.com/accessibility/>

Accessibility of Code Examples in Documentation

Screen readers may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, some screen readers may not always read a line of text that consists solely of a bracket or brace.

Accessibility of Links to External Web Sites in Documentation

This documentation may contain links to Web sites of other companies or organizations that Oracle does not own or control. Oracle neither evaluates nor makes any representations regarding the accessibility of these Web sites.

TTY Access to Oracle Support Services

Oracle provides dedicated Text Telephone (TTY) access to Oracle Support Services within the United States of America 24 hours a day, seven days a week. For TTY support, call 800.446.2398.

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 connects to a Virtual Sequential Access Method (VSAM) system through the Oracle Application Server Adapter for VSAM (OracleAS Adapter for VSAM). The OracleAS Adapter for VSAM provides connectivity and runs interactions on a VSAM system. This section provides an overview of the feature and architecture of OracleAS Adapter for VSAM.

This section contains the following topics:

- [OracleAS Adapter for VSAM Overview](#)
- [OracleAS Adapter for VSAM Architecture](#)

OracleAS Adapter for VSAM Overview

The OracleAS Adapter for VSAM models VSAM as a simple database with an SQL front end. The adapter is native to the data source and IBM OS/390 or z/OS system, providing direct access that results in improved performance.

OracleAS Adapter for VSAM includes the following features:

- Captures and maintains a metadata schema for VSAM by importing COBOL copybooks and transforming them into mapping definitions for Oracle Connect for VSAM on the IBM OS/390 or z/OS system and by associating the data structures with specific physical files.
- Full-fledged query processor and optimizer that runs SQL against the VSAM data with full support for VSAM data types such as arrays.
- 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.
- Maps data structures for facilitating access to VSAM 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.
- Enables you to access VSAM data managed by CICS or directly.
- Does support global transactions under CICS and can fully participate in a distributed transaction.

VSAM Data

VSAM is an IBM disk file storage scheme first used in S/370 and VS (Virtual Storage). VSAM comprises the following three access methods:

- Keyed Sequential Data Set (KSDS)-indexed file
- Relative Record Data Set (RRDS)-relative file
- Entry Sequenced Data Set (ESDS)-sequential file

These VSAM access methods are supported by the adapter

VSAM has no built-in metadata schema although a VSAM file does include information about its type (KSDS, RRDS, or ESDS) and index definition (KSDS only). Typically, VSAM is used by COBOL programs, either standalone (also known as batch programs) or CICS transactions. The VSAM record definitions are typically maintained within the COBOL code as COBOL copybooks.

Accessing VSAM Data

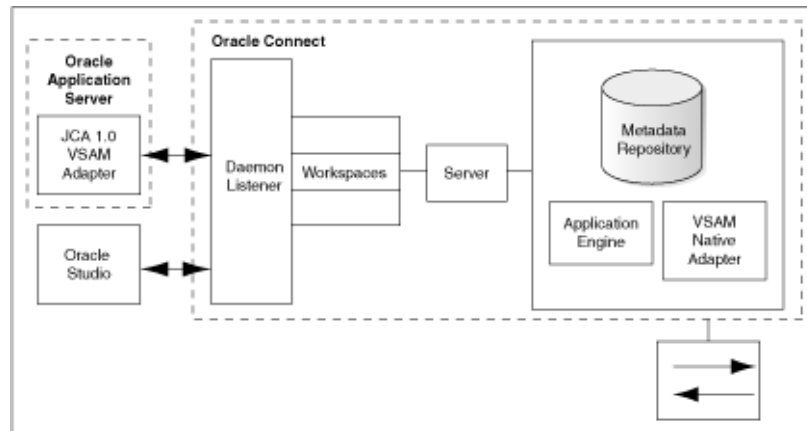
OracleAS Adapter for VSAM enables access to VSAM data under CICS or directly. If the VSAM cluster is managed by CICS, you can still access VSAM data directly to improve performance when the VSAM data is managed by CICS but access to it is read only, and there is no risk that changes are buffered by CICS while the read is performed.

OracleAS Adapter for VSAM Architecture

OracleAS Adapter for VSAM includes the following components:

- J2CA 1.5 VSAM adapter: The J2CA VSAM adapter is a standard resource adapter that is compliant with J2EE Connector Architecture, providing J2EE components connectivity.
- Oracle Connect: Oracle Connect runs on the legacy system and handles requests from the J2CA 1.5 VSAM 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 platform. Oracle Studio uses perspectives that enables you to generate specific information necessary to model OracleAS Adapter for VSAM.

The following figure illustrates the components of OracleAS Adapter for VSAM:

Figure 1–1 The Adapter Architecture

See Also: *Oracle Application Server Adapter Concepts Guide*

Integration Flow from Oracle Application Server to the Legacy Application

The J2CA 1.5 VSAM 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 VSAM 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 native structures understandable by VSAM and passes the converted XML to the back-end adapter. The back-end adapter builds an interaction based on the metadata for the back-end adapter stored in the repository and the incoming converted XML, and passes it to the legacy application. The results of this execution are passed back to the application engine, using the back-end adapter, where these results are converted to XML and passed back to the client.

Installing and Configuring OracleAS Adapter for VSAM

This section describes how to install Oracle Connect and Oracle Studio from the CD-ROM, and how to configure Oracle Connect using Oracle Studio.

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

This section includes the following topics:

- [Preinstallation Tasks](#)
- [Installing Oracle Connect on an IBM OS/390 or z/OS Series Platform](#)
- [Updating an Existing Oracle Connect Installation with VSAM](#)
- [Installing Oracle Studio](#)
- [Configuring Oracle Connect](#)

Preinstallation Tasks

Before installing OracleAS Adapter for VSAM, ensure that your computer meets the following requirements:

- [IBM OS/390 or z/OS Hardware and Software Requirements](#)
- [Windows Hardware and Software Requirements](#)

IBM OS/390 or z/OS Hardware and Software Requirements

This section describes the following requirements for installing Oracle Connect on an IBM OS/390 or z/OS platform:

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

Hardware Requirements

The following table summarizes the hardware requirements for Oracle Connect.

Hardware Component	Requirements
Processor	An IBM S/390 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.
CD-ROM Drive	An internal or external CD-ROM drive.
Disk Space (3380 and 3390 disks)	150 cylinders.

Software Requirements

The following table summarizes the software requirements for Oracle Connect.

Software Component	Requirements
Operating System	IBM OS/390 V2R5 or higher Or IBM z/OS Series V1R0 or higher
CICS TP Monitor (when accessing VSAM 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.
Oracle Application Server	Oracle Application Server 10g (10.1.3).

Windows Hardware and Software Requirements

This section describes the following requirements for installing Oracle Studio:

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

Hardware Requirements

The following table summarizes the hardware requirements for Oracle Studio.

Hardware Component	Requirements
Processor	An Intel or 100% compatible personal computer (PC), based on a Pentium processor
Memory	256 MB of RAM
CD-ROM Drive	An internal or external CD-ROM drive
Disk Space for Oracle Studio	100 MB of free disk space

Software Requirements

The following table summarizes the software requirements for Oracle Studio.

Software Component	Requirements
Operating System	Microsoft Windows 2000 with service pack 2 or higher, or Microsoft Windows XP, or Microsoft Windows 2003
Microsoft	Network transport protocol software, TCP/IP, included with Microsoft Windows

Installing Oracle Connect on an IBM OS/390 or z/OS Series Platform

This section explains how to install Oracle Connect from the CD-ROM. This section includes the following:

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

Note: If you have an Oracle Connect back-end adapter already installed on the IBM OS/390 or z/OS platform, then follow the instructions described in "[Updating an Existing Oracle Connect Installation with VSAM](#)" on page 2-12.

The other back-end adapters that run on an IBM OS/390 or z/OS platform are:

- OracleAS Adapters for CICS
 - OracleAS Adapter for IMS/DB
 - OracleAS Adapter for IMS/TM
-

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 2-1 Preinstallation Information

Topic	Required Information	Default	Comment
General	Operating system	-	OS/390 V2R5 or higher, or z/OS Series V1R0 or higher
-	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	OCL1012	-
-	Volume	-	-
-	Unit	3390	SMS only: unit where SMS resides.

Table 2–1 (Cont.) Preinstallation Information

Topic	Required Information	Default	Comment
-	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.SDFHEXCL	To access VSAM data under CICS

Table 2–2 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 VSAM data under CICS)
Permission to update the security manager, such as RACF
Optionally, permission to specify an output class for Oracle Connect output

Table 2–3 Installation Checklist

Step	Comment/Outputs
tso profile prefix	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	420 tracks (3390), format=FB, record length=80, block size=3120
FTP files to OS/390 (or 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 and BUILDKIT.LOAD created
EX {HLQ}.BUILDKIT.SRC(NAVINST)	Successful MAXCC is 0 or 4

Preinstallation Instructions

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

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

Before starting the installation, make sure 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 VSAM data under CICS
- Permission to update the security manager, such as RACF

Note: Optionally, make sure 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 OS/390 or the z/OS platform is present in the following datasets:

- OCL1012.TRANSMIT.KIT
- OCL1012.TRANSMIT.LOAD

These datasets are provided on a CD-ROM in the directory `Oracle_Connect\VSAM_Legacy_Adapter`.

Importing the Installation Kit

Perform the following steps 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 the following files:

- OCL1012.TRANSMIT.KIT = 130 tracks (3380 and 3390 disks)
- OCL1012.TRANSMIT.LOAD = 420 tracks (3380 and 3390 disks)

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

3. Using FTP, copy OCL1012.TRANSMIT.KIT and OCL1012.TRANSMIT.LOAD in binary mode from the installation CD-ROM to the mainframe. You can replace the OCL1012 high-level qualifier to any qualifier you want.

Installation Instructions

Perform the following steps to install Oracle Connect:

1. From within TSO, 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. The default value is OCL1012.

Note: You can use more than one high-level qualifier (such as `ACME.DEV.OCL1012`) 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, then the library is extracted to the current unit and volume.

3. Run the `PREPARE` member of the `nn.TRANSMIT.LIB` library:

```
ex PREPARE
```

Follow the instructions in the Response column in [Table 2-4](#) for each entry in the Screen column.

Table 2-4 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.TRANSMIT.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, run the NAVINST member:

ex NAVINST

Follow the instructions in the Response column in [Table 2–5](#) for each entry in the Screen column.

Table 2–5 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.	The high-level qualifier for the installation (referred to as <i>INSTROOT</i> throughout this guide)
ENTER THE HIGH LEVEL QUALIFIER ["QUALIFIER"]:	You can use more than one high-level qualifier (such as <code>ACME.DEV.VA10</code>). 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 "transmit" and "buildkit" 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 HOLD 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.

Table 2–5 (Cont.) Installation Prompts and Responses

Screen	Response
ADDING AND UPDATING ORACLE CONNECT FOR VSAM 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.	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.
ENTER A VALID USER NAME FOR AN ORACLE CONNECT ADMINISTRATOR [ALL]:	
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 INSTJBOR is located.

- In the *nnn.BUILDKIT.SRC* library, run the VSAM member:

ex VSAM

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

Table 2–6 VSAM Adapter-Specific Installation Prompts and Responses

Screen	Response
DO YOU WANT ORACLE CONNECT FOR LEGACY ADAPTER TO WORK WITH VSAM UNDER CICS (YES/NO) [NO]:	Answer YES to this prompt if you want to access VSAM data under CICS.
ENTER THE CICS EXCI LOAD LIBRARY NAME [CICSTS13.CICS.SDFHEXCI]:	If you responded YES to working with VSAM under CICS, then enter the CICS EXCI load library name only if you do not want the default.
PLEASE CONFIRM (YES/NO/QUIT) [YES]:	If you responded YES to working with VSAM under CICS, then confirm the entered details.
ENTER THE ISPF LOAD LIBRARY NAME [ISP.SISPLOAD] :	Enter the ISPF load library name only if you do not want the default.
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 HOLD 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.

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.

Postinstallation Instructions

The following postinstallation tasks must be done to work with Oracle Connect:

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

Postinstallation 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\VSAM_Legacy_Adapter directory in the installation CD 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 following command:

```
"/setprog apf,add,dsn=INSTROOT.loadaut,volume=vol002"
```

Where vol002 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 (restart) 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 (NAVCMD) 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 `ATTTDAEMN` script to include the IP address and port of the IBM OS/390 or z/OS platform.

For example, before:

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

After:

```
// PARM='-B -L ip_address:2252 START IRPCDINI'
```

Where *ip_address* is the ip address of the computer, 2552 is the default port for starting the daemon and `IRPCDINI` is the default daemon configuration.

- The `ATTTDAEMN` and `ATTTSRVR` 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 `ATTTDAEMN` and `ATTTSRVR` with a started task class and a general profile that enables the following:
 - Permission to issue master console commands.
 - `START` authority for the `ATTTSRVR` job.
 - Access to an Open OS/390 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, then you must also change the relevant cards in the following jobs to the new locations:

- `ATTTSRVR`: 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 2552 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'
```

`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 sub command. The `ATTTDAEMN JCL` is similar to the following:

```

// *ATTDAEMN 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 ATYSVCW member was moved.

Setting Up Oracle Connect to Update VSAM Data

Perform the following to set up Oracle Connect so that you can update VSAM data.

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

```
CEDA DEF PROG(UPDTRNS) G(ORA) LANG(C) DA(ANY) DE(ORACLE VSAM UPDATE PROG)
```

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

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

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

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

```
// IDCYSIN DD DSN=&&VSAM, DISP=(NEW,DELETE,DELETE),
// SPACE=(TRK,(1)), UNIT=SYSDA,
```

```
// DCB=(BLKSIZE=3200,LRECL=80,RECFM=FB)
```

Updating an Existing Oracle Connect Installation with VSAM

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

Table 2–7 Preinstallation Information

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

Table 2–8 Required Permissions

Permission
Permission to read the CICS EXCI library

In the `nnn.BUILDKIT.SRC` library, run the `CUSTOCL` member:

```
ex CUSTOCL
```

Follow the instructions in the Response column in [Table 2–9](#) for each entry in the Screen column.

Table 2–9 VSAM Adapter Installation Prompts and Responses

Screen	Response
DO YOU WANT ORACLE CONNECT FOR LEGACY ADAPTER TO WORK WITH IMS/DB (YES/NO) [YES]:	Answer YES to this prompt if you have Oracle Connect for VSAM already installed.
ENTER DBD LIBRARY NAME [IMS.DBDLIB]:	If you responded YES to working with VSAM, then enter the library where database definition (DBD) files are located.
ENTER PSB LIBRARY NAME [IMS.PSBLIB]:	If you responded YES to working with VSAM, then enter the library where Program Specification Blocks (PSBs) are located.
ENTER YOUR PSB NAME [HOSPPSB]:	If you responded YES to working with VSAM, then enter the name of the PSB file to use.
PLEASE CONFIRM (YES/NO/QUIT) [YES]:	If you responded YES to working with VSAM, then confirm the entered details.
DO YOU WANT ORACLE CONNECT FOR LEGACY ADAPTER TO WORK WITH IMS/DB UNDER CICS (YES/NO) [NO]:	If you want to access VSAM data under CICS, using the Oracle Application Server Integration Adapter for IMS/DB, then respond YES.
ENTER THE CICS EXCI LOAD LIBRARY NAME [CICSTS13.CICS.SDFHEXCI]:	If you responded YES to working with VSAM under CICS, then enter the CICS EXCI load library name only if you do not want the default.
PLEASE CONFIRM (YES/NO/QUIT) [YES]:	If you responded YES to working with VSAM under CICS, then confirm the entered details.
DO YOU WANT ORACLE CONNECT FOR LEGACY ADAPTER TO WORK WITH CICS APP ADAPTER (YES/NO) [YES]:	Answer YES to this prompt.
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.

Table 2–9 (Cont.) VSAM Adapter Installation Prompts and Responses

Screen	Response
THE VSAM DRIVER IS INSTALLED AUTOMATICALLY. DO YOU ALSO WANT ORACLE CONNECT FOR LEGACY ADAPTER TO WORK WITH VSAM UNDER CICS (YES/NO) [NO]:	Answer YES to this prompt if you have Oracle Connect for VSAM already installed and you want to access VSAM data under CICS.
ENTER THE CICS EXCI LOAD LIBRARY NAME [CICSTS13.CICS.SDFHEXCI]:	If you responded YES to working with VSAM under CICS, then enter the CICS EXCI load library name only if you do not want the default.
PLEASE CONFIRM (YES/NO/QUIT) [YES]:	If you responded YES to working with VSAM under CICS, then confirm the entered details.
ENTER THE ISPF LOAD LIBRARY NAME [ISP.SISPLOAD]:	Enter the ISPF load library name only if you do not want the default.
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 HOLD 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.

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 postinstallation tasks, as described in "[Postinstallation Instructions](#)" on page 2-9, as required.

Installing Oracle Studio

This section explains how to install Oracle Studio from the CD-ROM.

Note: If you have Oracle Studio already installed because you are also using another legacy adapter, then you do not need to reinstall it.

The other legacy adapters are:

- OracleAS Adapters for CICS
 - OracleAS Adapter for IMS/DB
 - OracleAS Adapter for IMS/TM
 - OracleAS Adapters for Tuxedo
-

Installing Oracle Studio from the CD-ROM

Assuming that the CD-ROM drive is D:, the installation file is located in the `D:\Oracle_Studio` directory. Install Oracle Studio from the CD-ROM by running the self-extracting executable installation file, `OSL904-win32.exe`.

Note: If you are installing Oracle Studio on a Windows XP computer, then you cannot specify a logical drive as the destination folder for the 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 OS/390 or z/OS platform where the VSAM data resides.

To configure Oracle Connect, refer to the following sections:

- [Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio](#)
- [Securing Access to Oracle Connect](#)
- [Modeling Interactions for OracleAS Adapter for VSAM](#)
- [Viewing the XML Schema](#)
- [Creating XML Schemas](#)

Note: These tasks assume you have permission to access the IBM OS/390 or 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.

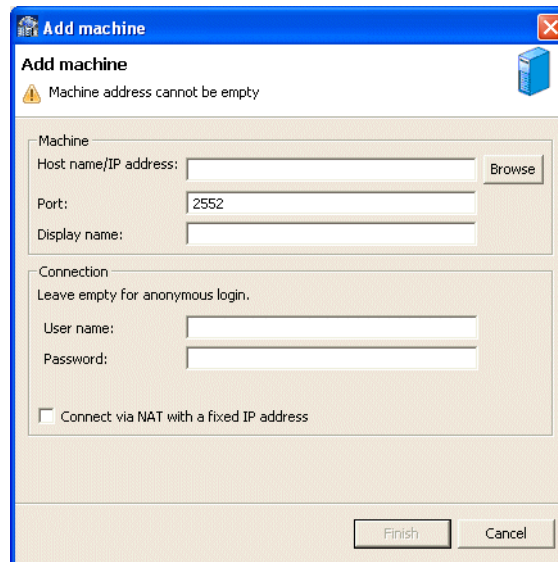
Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio

Using Oracle Studio, perform the following steps to configure the IBM OS/390 or z/OS platform:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**. Oracle Studio opens.
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 2552.
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 runtime.

During modeling the following security mechanisms can be applied:

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

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

- [Setting Up Run-Time User Access to the IBM OS/390 or z/OS Platform](#)

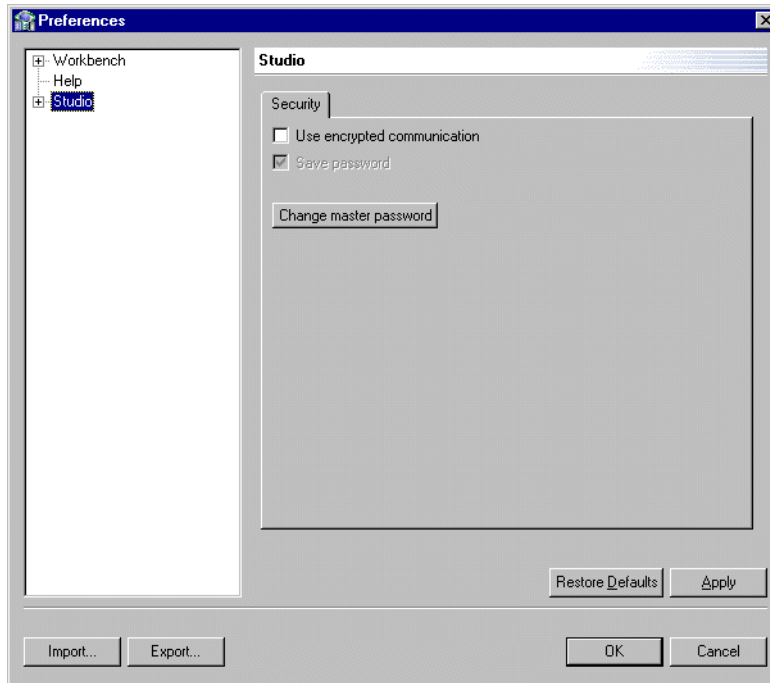
Setting Password Access to Oracle Studio

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 the password:

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

Figure 2–2 The Preferences screen



4. Click **Change 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 new password.
7. Click **OK**.

Specifying Users with Administrative Rights

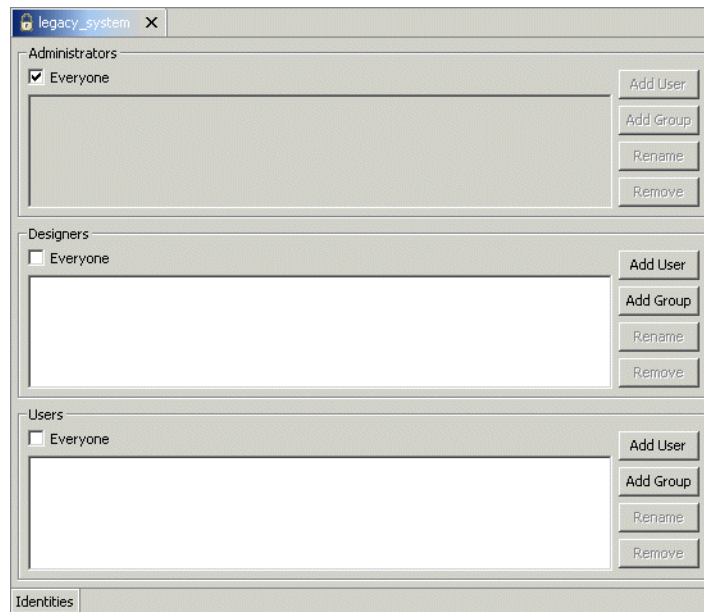
By default, only the user who was specified during the installation as an administrator has the authorization to modify settings on that computer from Oracle Studio. This user can then authorize other users to make changes or to view the definitions for a selected computer. Adding a computer to Oracle Studio is described in ["Setting Up the IBM OS/390 or 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**.
2. Right-click the computer in the Configuration Explorer and select **Administration Authorization**.

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

Figure 2–4 The Administration Authorization Identities tab



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.

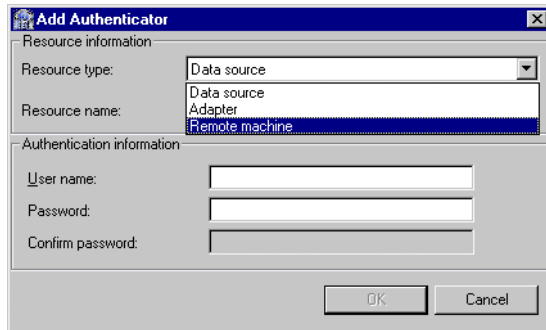
Setting Up Run-Time User Access to the IBM OS/390 or z/OS Platform

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. In the Configuration Explorer, expand the node of the computer which you want to set the user name and password.

2. Expand the **Users** node.
3. Right-click **NAV** and select **Edit User**. The NAV user profile editor is displayed.
4. In the User editor, click **Add**. The Add Authenticator screen is displayed as shown in the following figure:

Figure 2–5 The Add Authenticator screen



5. Select **Remote Machine** from the Resource Type list.
6. Enter the name of the IBM OS/390 or z/OS computer defined in Oracle Studio.
7. Enter the name and password used to access the computer and confirm the password.
8. Click **OK**.

Modeling Interactions for OracleAS Adapter for VSAM

Modeling interactions for OracleAS Adapter for VSAM involves defining an Oracle Connect back-end adapter, using Oracle Studio. All the definitions specified in Oracle Studio are written to the IBM OS/390 or z/OS platform.

This section contains the following:

- [Setting Up the VSAM Data Source](#)
- [Importing Metadata for the VSAM Data Source](#)
- [Setting Up an Oracle Connect Adapter](#)
- [Generating Outbound Interactions](#)

Setting Up the VSAM Data Source

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

Perform the following steps to setup the VSAM data source:

1. From the **Start** menu, select **Programs, Oracle** and then select **Studio**.
2. In the Configuration Explorer, expand the node of the computer defined in "[Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio](#)" on page 2-14.
3. Expand the **Bindings** node. The binding configurations available on this computer are listed.
4. Expand the **NAV** binding node. The NAV binding configuration includes branches for data sources and adapters that are located on the computer.

5. Right-click **Data sources** and select **New Data source**.

The New Data Source screen is displayed.

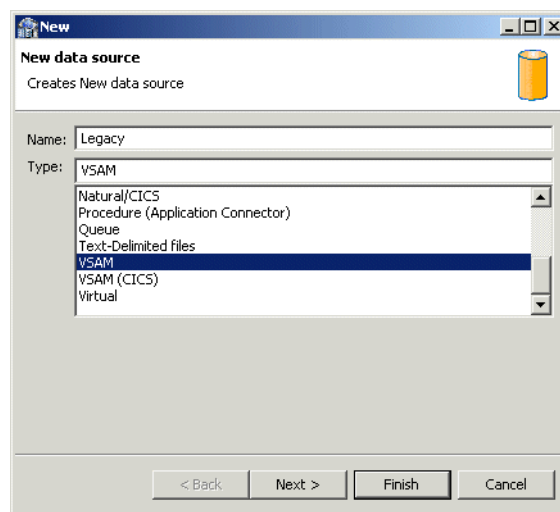
6. Enter a name for the VSAM data source. The name can contain letters and numbers and the underscore character only.
7. Select the data source type from the **Type** list, as follows:
 - If you are accessing VSAM data under CICS, then select **VSAM (CICS)**.
 - If you are accessing VSAM data directly, then select **VSAM**.

Note: Only use the VSAM option to connect directly to the VSAM data in the following circumstances:

- The VSAM records are not managed by CICS.
 - The VSAM records are required for read only purposes and changes to the data buffered by CICS while reading the data are not expected.
-

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

Figure 2–6 The New Data Source screen



8. Click **Next**. The Data Source Connect String screen is displayed.
9. Enter the Data source connect string. If you select **VSAM (CICS)**, then the following screen is displayed:

Figure 2–7 The Data Source Connect String screen

Where:

- **CICS Application ID:** 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. On the bottom right corner of the screen appears the legend `APPLID=target_system`.
- **Transaction ID:** The mirror transaction within CICS that receives control through `MRO`, which transfers the transaction from the Oracle Connect for VSAM environment to CICS. The default value is `EXCI`.
- **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 to `CEMT` the following command:

```
CEMT INQ CONN
```

Then you will see 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`.

- **Program Name:** The `UPDTRNS` program that is supplied by Oracle Connect for VSAM to enable updating VSAM data.

See Also: ["VSAM Running Under CICS"](#) on page 2-11 for details about the adapter metadata

- **Trace Queue:** The name of queue for output which is defined under CICS when tracing the output of the `UPDTRNS` program. When not defined, the default CICS queue is used.

If you select **VSAM**, then the Data Source Connect String screen is displayed, where you provide the following connection string properties:

- **Data HLQ:** The high-level qualifier where the data files are located. If a value is not specified in this field, then data files are written to the `DEF` high-level qualifier where Oracle Connect for VSAM is installed.
- **Disk Volume name:** The high-level qualifier (volume) where the data resides.

10. Click **Finish**.

The new data source is displayed in the Configuration Explorer.

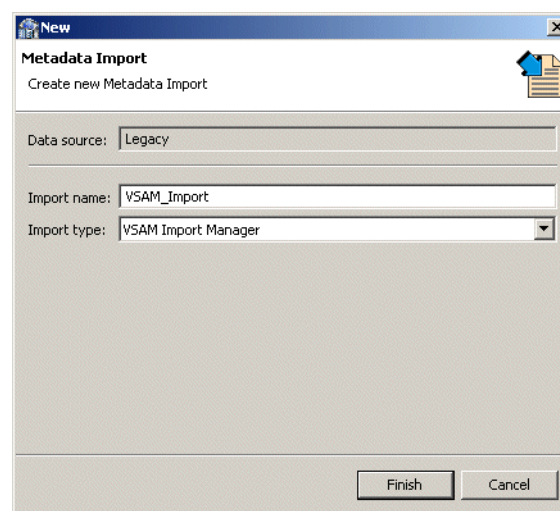
Importing Metadata for the VSAM Data Source

Oracle Connect requires metadata describing the VSAM data source records and the fields in these records. Use the Import Metadata procedure in Oracle Studio to import metadata for the VSAM data source from COBOL copybooks, which describe the data.

Perform the following steps to import metadata for the VSAM data source, as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. In the Configuration Explorer, expand the node of the computer defined in "[Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio](#)" on page 2-14.
3. Expand the **Bindings** node. The binding configurations available on this computer are listed.
4. Expand the **NAV** binding node
5. Expand the **Data sources** node.
6. Right-click the VSAM data source defined in "[Setting Up the VSAM Data Source](#)" on page 2-18.
7. Select **Edit Metadata** to open the Metadata tab, with the VSAM data source displayed under the data sources list.
8. Right-click the VSAM 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. Select the import type from the Import Type list, as shown in the following figure:

Figure 2–8 The Metadata Import screen



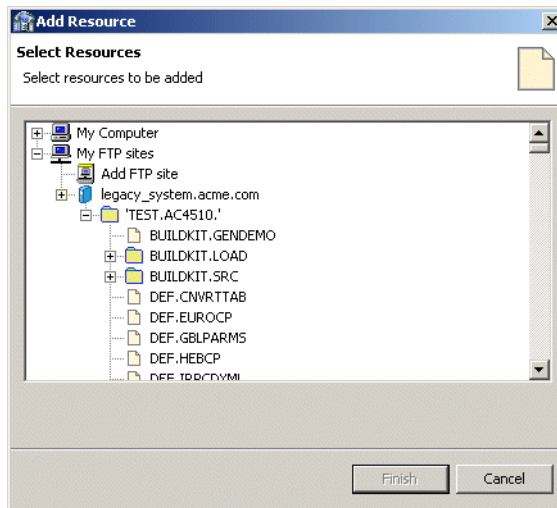
Note: The same New Import screen is displayed for both VSAM imports (VSAM under CICS and VSAM direct), with the exception of the Import type field value: either VSAM Under CICS Import Manager or VSAM Import Manager, respectively)

11. Click **Finish**. The Metadata Import wizard opens.
12. 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.
13. If the files are on another computer, then right-click My FTP Sites and select Add. Optionally, double-click **Add FTP site**. The Add FTP Site screen is displayed.
14. Enter the server name or IP address where the COBOL copybooks reside and enter a valid username and password to access the computer (if anonymous access is used, then click the Anonymous connection check-box) then click **OK**. The FTP site is added to the list of available sites.

Note: The selected server is accessed using the username as the high-level qualifier, enabling you to browse and transfer files.

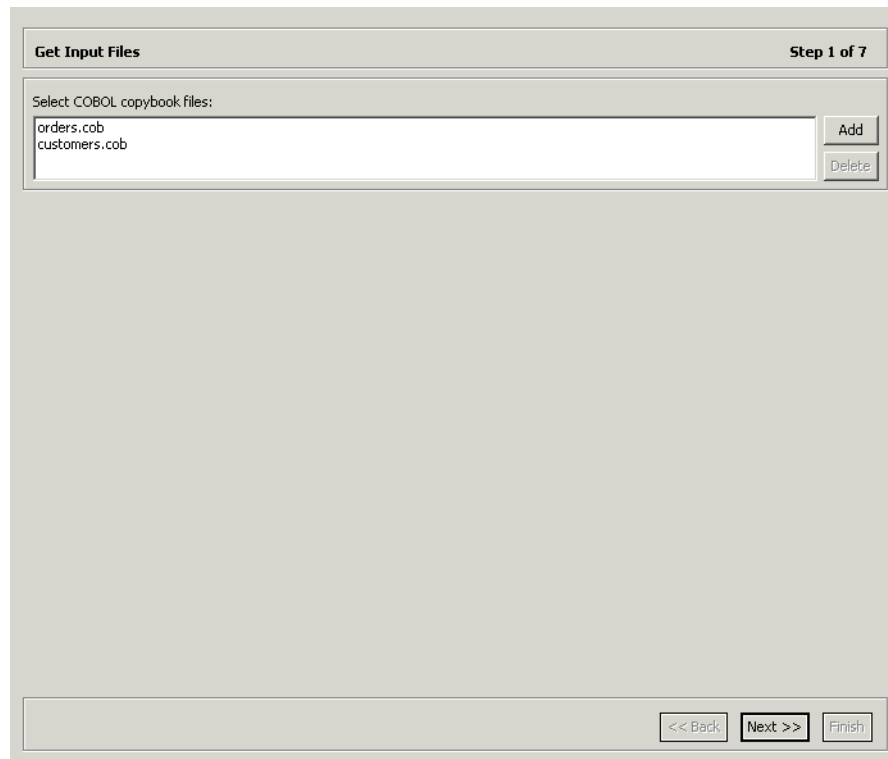
The Select Resources screen is shown in the following figure:

Figure 2–9 The Select Resources screen



15. Right-click the computer and select Set Transfer Type. Enter the transfer type (ASCII or BINARY) and click **OK**.
16. Expand the node of the added site and locate the necessary COBOL files. To change the high-level qualifier, right-click the computer and select Change Root Directory. Enter the high-level qualifier enclosed in quotes, and click **OK**.
17. Select the file or files and click **Finish**.

The selected file or files are displayed in the Metadata Import wizard, as shown in the following figure:

Figure 2–10 The Get Input Files screen

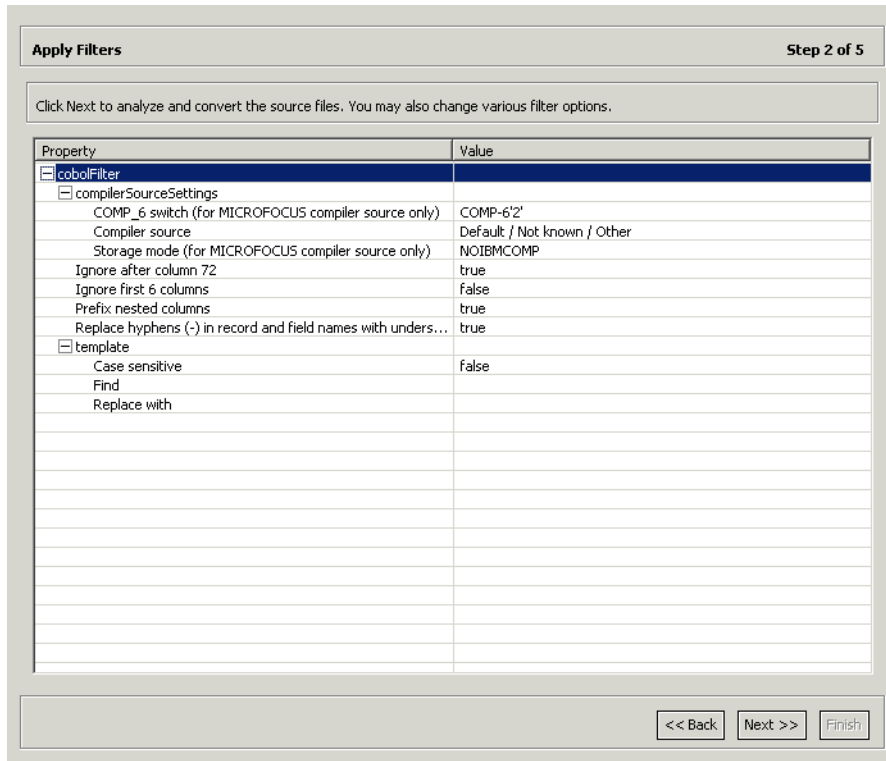
Note: You can import the metadata from one COBOL copybook and later add to this metadata by repeating the import procedure using different COBOL copybooks.

The format of the COBOL copybooks must be identical. That is, you cannot import a COBOL copybook that uses the first six columns with a COBOL copybook that ignores the first six columns. In this type of case you must repeat the import procedure.

18. Click **Next**. The Apply Filters screen is displayed.

The Apply Filters screen is shown in the following figure:

Figure 2–11 The Apply Filters screen



19. Apply filters to the copybooks as required.

The following table lists the available filters:

Table 2–10 Available Filters

Filter	Description
COMP_6 switch	The MicroFocus COMP-6 compiler directive. Specify either COMP-6'1' to treat COMP-6 as a COMP data type or COMP-6'2' to treat COMP-6 as a COMP-3 data type.
Compiler source	The compiler vendor.
Storage mode	The MicroFocus Integer Storage Mode. Specify either NOIBMCOMP for byte storage mode or IBMCOMP is for word storage mode.
Ignore after column 72	Ignores columns 73 to 80 in the COBOL copybook.
IgnoreFirst6	Ignores the first six columns in the COBOL copybook.
Replace hyphens (-) in record and field names with underscores (_)	Replaces all hyphens in either the record or field names in the metadata generated from the COBOL with underscore characters.
Prefix nested columns	Prefix all nested columns with the previous level heading.
Case sensitive	Specifies whether to be sensitive to the search string case.
Find	Searches for the specified value.
Replace with	Replaces the value specified for Find with the value specified here

Figure 2–13 The Import Manipulation screen

!	Table Name	Metadata Source	Data Location
	ORDERS	orders.cob	Not applicable
✘	CUSTOMERS	customers.cob	Not applicable
	CUSTOMERS	customers.cob	Not applicable

Validation	Log
✘	Duplicated table name: customers.cob/CUSTOMERS
✘	Duplicated table name: customers.cob/CUSTOMERS

This screen enables you to perform the following operations:

- Resolve table names, where tables with identical names are generated from different COBOL copybooks specified during the import.
- Specify the physical location for the data.
- Specify table attributes.
- Manipulate the fields generated from the COBOL, as follows:
 - Merging sequential fields into one for simple fields.
 - Resolving variants by either marking a selector field or specifying that only one case of the variant is relevant.
 - Adding, deleting, hiding, or renaming fields.
 - Changing a data type.
 - Setting a field size and scale.
 - Setting a field as nullable.
 - Changing the order of the fields.
 - Selecting a counter field for fields with dimensions (arrays). You can select the counter for the array from a list of potential fields.
 - 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 dimensions.

The **Validation** tab at the lower area of the screen displays information about what needs to be resolved in order to validate the tables and fields generated from the COBOL. The Log tab displays a log of what has been performed (such as renaming a table or specifying a data location).

22. To manipulate table metadata, right-click the table record, and select the necessary operation. The following table lists the available options:

Table 2–11 Table Manipulation options

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

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

24. Click Next. The next step depends whether the VSAM Under CICS Import Manager or the VSAM Import Manager is used.

If the VSAM Under CICS Import Manager is used, then the Assign File Names screen is displayed, as shown in the following figure:

Table 2–12 (Cont.) Adapter Properties

Property	Description
multipleResults	Leave this value as true.

Note: You must specify the VSAM data source name you used to define in Oracle Studio for the defaultDatasource property.

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 Configuration Explorer, expand the node of the computer defined in "[Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio](#)" on page 2-14.
3. Expand the **Bindings** node. The binding configurations available on this computer are listed.
4. Expand the **NAV** binding node.
5. Expand the **Adapters** node.
6. Right-click the Database back-end adapter defined in "[Setting Up an Oracle Connect Adapter](#)" on page 2-29.
7. Select **Edit metadata** to open the Metadata tab, with the database back-end adapter displayed under the adapters list.
8. Right-click the Interactions node and select **New** to open the New Interaction wizard. The wizard opens with the following options displayed:
 - Automatic: Four interactions are generated for each VSAM table, enabling you to run the `SELECT`, `INSERT`, `UPDATE`, and `DELETE` commands.
 - Manual: One interaction is generated, based on the type of SQL selected: Database Query (a `SELECT` statement) or Database Modification (an `INSERT`, `UPDATE` or `DELETE` statement).

Note: VSAM does not support the stored procedure option.

9. Select how you want to generate interactions (Automatic or Manual).
If you select Automatic generation, then perform the following steps:
 - a. Click **Next**. The Select Tables screen is displayed, enabling you to add tables that you want to access with the interaction from the VSAM data source.
 - b. Click **Add** to add 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.
 - c. Select the tables that you want to access with the interaction and click the right-pointing arrow to move the selected tables to the right-hand pane.

- d. Click **Finish**. The selected tables are displayed.
- e. Click **Finish**. Four interactions are generated for each table selected, together with the record structures to support the interactions and the responses from the VSAM data source.
- f. 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, then 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 SQL query.

Note: If Database query 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).

The SELECT or Modification query is built as follows:

- Selecting Tables: In the left-hand pane, expand the data source node where the required table resides and select the required table. Drag and drop it to the first available row in the Tables tab in the right-hand pane.
- Selecting Columns: Click the Columns tab in the right-hand pane. In the left-hand pane, expand the data source and the table containing the required column. Select the required column and drag and drop it into the Columns tab in the right-hand pane.
- Joining columns from different tables: When a column from a different table is selected, the Join Tables wizard is displayed. Expand the table node in the left-hand pane, select the required column and click the right-pointing arrow. Click Next to set the operator and logical parameters for each column/segment as required, and then click Finish to close the wizard.
- Adding conditions in a WHERE clause: Select the column you are setting the WHERE clause for, and drag and drop it into the Where tab in the right-hand pane. Set the operator, value and logical parameters as required.
- Grouping columns: Select the required columns and drag and drop them into the Group tab in the right-hand pane.
- Filtering results using a HAVING clause: The HAVING clause provides conditions for grouping columns. Select the required column and drag and drop it into the Having tab in the right-hand pane. Set the operator, value and logical parameters as required.

- Sorting results: Select the column whose results you want to sort and drag and drop it into the Sort tab in the right-hand pane. Set the sort order as required.
- d. Click **Next**. The Interaction Parameters screen is displayed, enabling you to specify input parameters for the interaction. The following parameters are specified:

Table 2–13 Interaction Input 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, then the column is skipped.

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

Table 2–14 Interaction Parameters

Parameter	Description
Name	The name of the parameter.
Type	The type of parameter (such as string, number, binary).
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: ["Metadata for the Back-end Adapter"](#) on page A-8 for details about the data source metadata

Viewing the XML Schema

The XML describing the adapter interactions can be viewed in Oracle Studio Design perspective **Source** tab.

A sample **Source** tab is shown in the following figure:

Figure 2–17 The Source tab



```

<?xml version="1.0" encoding="UTF-8"?>
<table name="customer" datasource="__NAVDEMO" description=""
  fileName="D:\Program Files\Oracle\Server\demo\customer"
  nBlocks="0" nRows="0" bookmarkSize="4" organization="index">
  <fields>
    <field name="c_custkey" datatype="int4"/>
    <field name="c_name" datatype="cstring" size="25"/>
    <field name="c_address" datatype="cstring" size="40"/>
    <field name="c_nationkey" datatype="int4"/>
    <field name="c_phone" datatype="string" size="15"/>
    <field name="c_acctbal" datatype="double"/>
    <field name="c_mktsegment" datatype="string" size="10"/>
    <field name="c_comment" datatype="cstring" size="117" nullable="true"/>
  </fields>
  <keys>
    <key name="cindex" size="4">
      <segments>
        <segment name="c_custkey"/>
      </segments>
    </key>
  </keys>
</table>

```

Creating XML Schemas

The XML schema describing the adapter interactions and the input and output records for these interactions is created automatically during the import procedure, as described in ["Generating Outbound Interactions"](#) on page 2-31.

Deployment and Integration with the Oracle OC4J Container

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

This section includes the following topics:

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

Integrating OracleAS Adapter for VSAM with OC4J

Oracle Application Server provides a complete Java 2 Enterprise Edition (J2EE) environment that runs 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 VSAM Adapter

To connect to the J2CA 1.5 VSAM adapter, 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 "Securing Access to Oracle Connect" on page 2-15.

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 OS/390 or z/OS Platform in Oracle Studio" on page 2-14. See Also: Appendix C, "Advanced Tuning of the Daemon" for details about the daemon.
workspace	Specifies to the name of a Oracle Connect server workspace to use. The default workspace is Navigator. See Also: "Workspaces" for details about workspaces.
portNumber	Specifies the TCP/IP port where the Oracle Connect daemon is running on the server. The default port is 2552.
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 "WS Security" for details about users allowed to access an Oracle Connect server.
password (optional)	Specifies a valid password for the user.
persistentConnecti on (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 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 VSAM adapter:

1. Look up a `ConnectionFactory` for the J2CA 1.5 VSAM 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 holds properties for driving an interaction with an EIS instance. It is used by the interaction to run the specified function on the underlying EIS. It 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. After the interactions have been processed, close the `Interaction` and `Connection` objects.

Configuring Multiple Adapters

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

See Also: *Oracle Application Server Adapter Concepts Guide*

Updating Configuration Information

You can change 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.

Troubleshooting OracleAS Adapter for VSAM

Troubleshooting Oracle AS Adapter for VSAM 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 VSAM 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 VSAM is installed. In case you have shut down the daemon, as described in "[Shutting Down the Daemon](#)" on page 4-2, you can restart the daemon as described in the following task.

Note: The daemon is started on the IBM OS/390 or z/OS platform. It cannot be started remotely using Oracle Studio.

Task: Starting the Daemon

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

'/s ATTD AEMN'

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

See Also: [Starting the Daemon](#) for details about the ATTD AEMN 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 OS/390 or 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 OS/390 or 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 4-1 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.
View Log	Displays the daemon log. For details see " Daemon Logs " on page 4-4.
View Events	Displays the daemon events log.

Table 4–1 (Cont.) Daemon Options

Option	Description
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 4–2 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 4-4
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.
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 4-3 Server Options

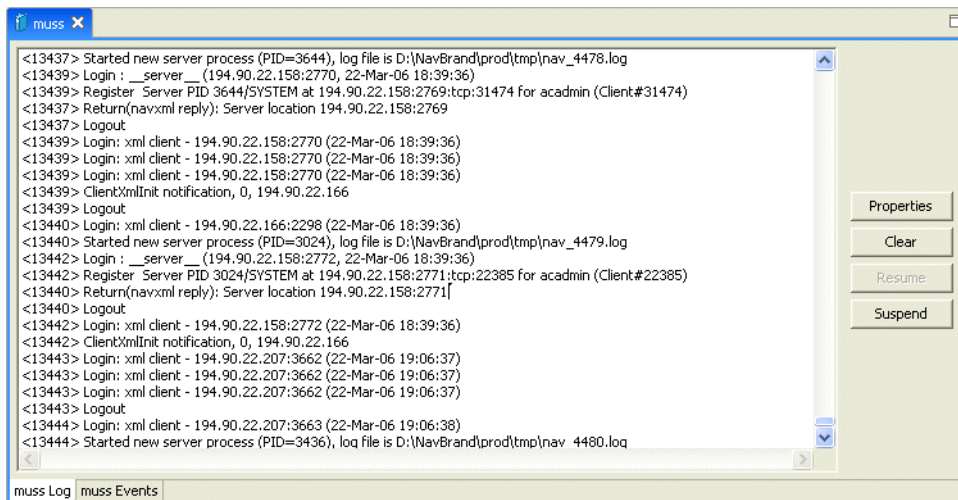
Option	Description
Status	Checks the status of the server. The information about the server includes the server mode and the number of active client sessions for the server.
View Log	Displays the server log. For details see "Daemon Logs" on page 4-4.
View Events	Displays the server events log.
Kill server	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: ["WS Logging"](#) on page C-13.

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: ["WS Logging"](#) on page C-13.

Resolving Communication Errors

When Oracle Studio disconnects from the IBM OS/390 or 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 OS/390 or z/OS computer.

Table 4–4 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 VSAM 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 OS/390 or 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 OS/390 or z/OS platform.

See Also: ["Setting Up Run-Time User Access to the IBM OS/390 or 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: ["Daemon 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: ["Daemon Security"](#) on page C-5.

Action: Edit the user profile in Oracle Studio to specify a valid username and password for the IBM OS/390 or z/OS platform.

See Also: ["Setting Up Run-Time User Access to the IBM OS/390 or 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: ["WS Info."](#) 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 OS/390 or z/OS platform.

See Also: ["Setting Up Run-Time User Access to the IBM OS/390 or 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: ["WS Server"](#) on page C-9.

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 OS/390 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 WS Security tab of the Navigator workspace, under the daemon node in the Configuration Explorer, check the 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: ["WS Info."](#) 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: ["WS Server"](#) on page C-9.

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: ["Daemon 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 OS/390 or 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: ["WS Info."](#) 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 OS/390 or 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 "WS 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 VSAM

Oracle Connect includes a number of tuning parameters that can improve performance. Specifically, the daemon can be configured to optimize communication between the IBM OS/390 or 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 the daemon and the 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 Configuration Explorer, expand the node of the computer defined in "[Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio](#)" on page 2-14.
3. Expand the **Daemons** node. The daemon configurations available on this computer are listed.
4. Right-click **IRPCD** and select **New Workspace**. The **New Daemon Workspace** screen is displayed.

5. Specify a name for the new workspace and optionally add a description.
6. Specify whether you want it to have default settings or to 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.
7. Click **Next**. The Select Scenario screen is displayed.
8. Select **Application Server using connection pooling** and click **Next**.
9. Continue through the wizard, specifying the required values for the workspace.
10. To complete the workspace definition, 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 5–1 Workspace Definition Tabs

Tab	Description
WS Info	Specifies general information including the server type, the command procedure used to start the workspace, the binding configuration associated with this workspace and the timeout parameters.
WS Server Mode	Specifies workspace server information including features that control the operation of the servers started up by the workspace and allocated to clients.
WS Logging	Specifies parameters for logging and the format to use for a log file.
WS Security	Specifies administration privileges, user access, ports available to access the workspace and workspace account specifications.
WS Governing	This tab is not applicable for use with OracleAS Adapter for VSAM.

Use Oracle Studio to access these tabs, as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. In the Configuration Explorer, expand the node of the required computer.
3. Expand the **Daemons** node. The daemon configurations available on this computer are listed.
4. Expand the **IRPCD** node. The daemon workspaces are listed.
5. Right-click the required workspace and select **Edit Workspace**.
6. Select the tab which contains the information you want to edit. For full details of the tabs and the fields in these tabs, refer to "[Workspaces](#)" on page C-7.
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.

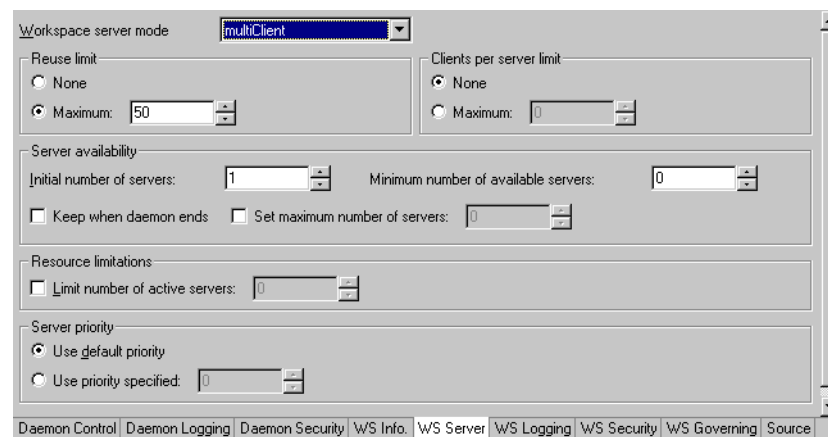
This mode enables servers to run under a particular user account and isolates clients from each other (because each receives its own process). However, this server mode incurs a high overhead due to process startup times and may use a lot of server resources (because it requires as many server processes 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 WS Server tab of the daemon workspace editor, as shown in the following figure:

Figure 5–1 The WS Server 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 WS Server tab.

- **Initial number of servers:** 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.
- **Minimum number of available 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 that of the Initial number of servers field value, then 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, meaning that new servers are created only when there are no other available servers.
- **Set maximum number of servers:** The maximum number of available server processes pooled for this workspace. If the server is reusable, once a client disconnects from the server, then the daemon returns the server to the pool of available servers. If the limit is reached, then excess server processes are discarded.
- **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. Thus, setting 10 servers and 10 prestarted sub-tasks results in 100 tasks started (10 sub-tasks for each process).

Configuring a Binding Environment

Each binding configuration includes the following information:

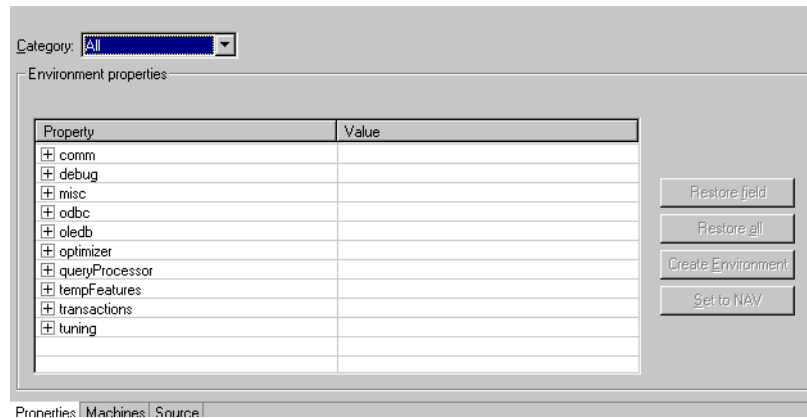
- Environment settings, which are used to configure the environment used by any of the adapters defined in the binding.
- Application adapters on the current computer.

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 Configuration Explorer, expand the node of the required computer.
3. Expand the **Bindings** node. The binding configurations available on this computer are listed.
4. Right-click **NAV** and select **Edit Binding**.
5. In the Properties tab, edit the environment settings as needed. To edit an environment setting, expand the property category and select the value to edit.

The binding Properties tab is shown in the following figure:

Figure 5–2 The Binding Properties tab



The binding environment is divided into the following categories:

- [comm Category](#)
- [debug Category](#)
- [miscellaneous Category](#)
- [odbc Category](#)
- [oledb Category](#)
- [optimizer Category](#)
- [queryProcessor Category](#)
- [transactions Category](#)
- [tuning Category](#)

These categories are described in the following paragraphs.

comm Category

The following table lists the parameters that define the communication buffers:

Table 5–2 comm Category Parameters

Parameter	Description
comCacheBufferSize	Specifies the size of a memory buffer on a client, which is used by the Oracle Connect client/server to store read-ahead data. The default is 200000 bytes.
comMaxSocketSize	Specifies the maximum bytes that can be written in one chunk on a socket. The default is -1 (no limitation).
comMaxXmlInMemory	Specifies the maximum size of an XML document held in memory. The default is 65535 bytes.
comMaxXmlSize	Specifies the maximum size of an XML document passed to another computer. The default is 65535 bytes.

debug Category

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

Table 5–3 *debug Category Parameters*

Parameter	Description
acxTrace	When set to <code>true</code> , the input xml sent to the back-end adapter and the output xml returned by the back-end adapter, are written to the log.
analyzerQueryPlan	This parameter is not applicable for use with OracleAS Adapter for VSAM.
gdbTrace	This parameter is not applicable for use with OracleAS Adapter for VSAM.
generalTrace	When set to <code>true</code> , logs general trace information. The default writes only error messages to the log.
logFile	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>.
oledbTrace	This parameter is not applicable for use with OracleAS Adapter for VSAM.
optimizerTrace	This parameter is not applicable for use with OracleAS Adapter for VSAM.
queryWarnings	This parameter is not applicable for use with OracleAS Adapter for VSAM.
traceDir	This parameter is not applicable for use with OracleAS Adapter for VSAM.

miscellaneous Category

The following table lists the parameters that define miscellaneous operations, including globalization support and the directory where temporary files are written:

Table 5–4 *misc Category Parameters*

Parameter	Description
codepage	For use with globalization support to identify the codepage for the workspace. See also: Appendix E, "Globalization Settings" .
cvtSeverityLevel	The data type conversion policy when a conversion error occurs: <ul style="list-style-type: none"> 0 (Default): The data in the output column will be a null or empty value. 1: The data in the output column will be a null or empty value and the error is reported to the log. 2: An error is reported and processing stops.
edit	This parameter is not applicable for use with OracleAS Adapter for VSAM.
language	Identifies the application language. A default codepage is selected based on the value specified for this parameter. See also: Appendix E, "Globalization Settings" .

Table 5–4 (Cont.) misc Category Parameters

Parameter	Description
nlsString	<p>Specifies the codepage used by a field whose data type is defined as "nlsString". Use this for a field whose codepage is other than that of the computer codepage. This parameter includes the following values:</p> <p>The name of the codepage.</p> <p>Whether the character set reads from right to left (as in middle eastern character sets). The default is false.</p>
tempDir	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.
year2000Policy	<p>Determines the way 2-digit years are converted into 4-digit years. When the parameter year2000Policy 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> <ul style="list-style-type: none"> ■ Fixed Base Year: year2000Policy is set to a value greater than, or equal to 1900. In this case, the value of year2000Policy is the first 4-digit year after 1900 that can be represented by a 2-digit year. For example, if year2000Policy is set to 1905, the years 2000->2004 will be represented by 00->04. All other 2 digits will map to 19xx. ■ 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 2-digit format. ■ The user will probably change the base date only after ensuring that these old dates have been deleted from the data source. ■ Sliding Base Year: year2000Policy is set to a positive value less than 100. In this case, the value of year2000Policy represents the number of years ahead of the current year that can be represented by a 2-digit number. With each passing year the earliest year that can be represented by a 2-digit number changes to a year later.

odbc Category

The odbc parameters are not applicable for use with OracleAS Adapter for VSAM.

oledb Category

The oledb parameters are not applicable for use with OracleAS Adapter for VSAM.

optimizer Category

The following parameters enable you to customize the performance:

goal: The optimization policy, which can be specified as one of the following:

- none (default): All row optimization is used.
- first: First row optimization is performed based on the assumption that the results produced by the query are used as the rows are retrieved. The query optimizer

uses a strategy that retrieves the first rows as fast as possible, which might result in a slower overall time to retrieve all the rows.

- all: Optimization is performed based on the assumption that the results produced by the query are used after all the rows have been retrieved. The query optimizer uses a strategy that retrieves all the rows as fast as possible, which might result in a slower time to retrieve the first few rows.

Aggregate queries automatically use all row optimization, regardless of the value of this parameter.

queryProcessor Category

The following table lists the parameters which enable you to fine tune how queries are processed:

Table 5–5 queryProcessor Category Parameters

Parameter	Description
compileAfterLoad	For internal use.
dsoThreadingBoth	For internal use.
emptyStringIsNull	When set to true, all empty strings are reported as NULL.
firstTreeExtensions	The maximum size allowed for an SQL query after compilation. The default value is 150 KB.
forceQualifiedNames	For internal use.
ignoreSegmentBindFailure	For internal use.
maxColumnsInParsing	The maximum number of columns that a query references. The default is 500 columns.
maxSqlCache	The maximum number of SQL queries stored in cache memory. The default value is 3.
noCommandReuse	When set to true, sets Query Processor not to cache for reuse the fd state of a query.
noCompilationCache	When set to true, sets Query Processor not to save a successfully compiled statement in the cache.
noDSPropertyCache	For internal use.
noInsertParameterization	When set to true, sets Query Processor not to parameterize constants in INSERT statements.
noMarkRowFailedFetch	When set to true, enables QueryProcessor to continue fetching data after a failure in retrieving a row.
noMetadataCaching	When set to true, Query Processor does not take object metadata from the cache but directly from VSAM.
noParallelExecution	For internal use.
noQueryParametrization	When set to true, sets Query Processor not to convert constants into parameters when accessing VSAM.
noQueryReadAhead	For internal use.
noSessionPooling	For internal use.
noSQSCache	For internal use.
noThreadedReadAhead	For internal use.
noThreads	For internal use.

Table 5–5 (Cont.) queryProcessor Category Parameters

Parameter	Description
noTreeAutoExtend	For internal use.
optimisticForUpdate	When set to <code>true</code> , optimistic locking becomes the default for locking behavior.
parserDepth	The maximum depth of the expression list.
proceduresCacheSize	For internal use.
promptDbUserPassword	For internal use.
tokenSize	The maximum length of a string in an SQL query. The minimum value is 64. The default value is 350.
useAlternateQualifier	For internal use.
useTableFilterExpressions	When set to <code>true</code> , enables the use of tables that have filter expressions specified in their metadata.

transactions Category

The following table lists the parameters that define the transaction support:

Table 5–6 transaction Category Parameters

Parameter	Description
convertAllToDistributed	When set to <code>true</code> , converts all simple transactions into distributed transactions.
convertAllToSimple	When set to <code>true</code> , converts all distributed transactions into simple transactions.
disable2PC	When set to <code>true</code> , disables global-transaction capabilities, even in drivers that support global transactions.
logFile	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 OS/390 or z/OS platform.
recoveryDelay	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.
useCommitConfirmTable	This parameter is not applicable for use with OracleAS Adapter for VSAM.

tuning Category

The following table lists the parameters that define the tuning:

Table 5–7 tuning Category Parameters

Parameter	Description
dsmMaxBufferSize	The maximum size of a cache memory. This cache is used when memory is required on a temporary basis (as when Oracle Connect sorts data for a query output, for a subquery, or for aggregate queries). This cache size is not used for hash joins and lookup joins (see the <code>hashBufferSize</code> parameter). The default value is 1000000 bytes.

Table 5–7 (Cont.) tuning Category Parameters

Parameter	Description
dsmMaxSortBufferSize	The maximum size of the sort buffers. Use this parameter instead of dsmMaxBufferSize for sorts only. The default value is 1000000 bytes.
dsmMidBufferSize	The maximum size of the index cache. This cache is not used for hash joins and lookup joins. The default value is 100000 bytes.
hashBufferSize	The amount of cache memory that is available for each hash join or lookup join. The default is 1000000 bytes.
hashEnableParallelism	Both sides of a hash join are read concurrently. The default is set to true.
hashMaxDiskSpace	The maximum amount of disk space (in MBs) that a query can use for hash joins. The default is unlimited (all the free space on the allocated disk). If a query requires more space than allocated through this parameter, then the query execution will stop. The minimum value for this parameter is 20 MB. Temporary files are written per query. Therefore, if several users can run queries at the same time, adjust the amount of space available, so that the total that can be allocated at any one time does not exceed the available space.
hashMaxOpenFiles	The maximum number of files that a query can open at one time for use when performing hash joins. The number assigned to this parameter must not exceed the system maximum. The default is set to 90 files.

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 Configuration Explorer, right-click the required computer and select **Export XML definitions**.
3. Specify the path and name of the XML file where the XML representation of the computer and its complete configuration is stored.
4. Edit any paths in the XML definition to the paths required on the target platform. For example, the setting for the serverLogFile parameter may require changing, depending on the platform.
5. 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 OS/390 or z/OS Platform in Oracle Studio"](#) on page 2-14.
6. In the Configuration Explorer, right-click the target computer and select **Import XML definitions**.
7. 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 OS/390 computer with RACF installed, and with the workspace server mode set to multi-tasking, a RACROUTE 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 VSAM, 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 Run Time 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 VSAM 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 list of ports specified in the Workspace Access section of the WS Security tab in Oracle Studio. For details on the WS Security tab, refer to "[WS Security](#)" on page C-16.

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 Workspace Users section of the WS Security tab in Oracle Studio. For details of the WS Security tab, refer to "[WS 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.

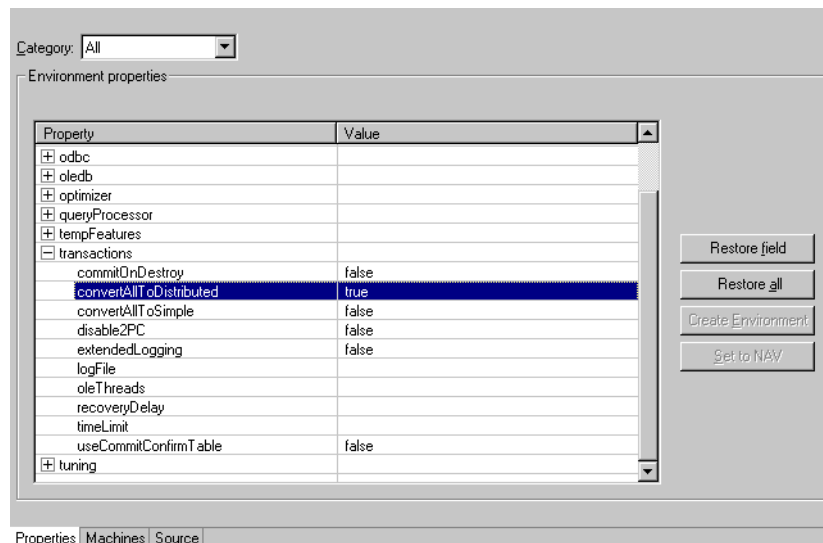
Note: You can also specify administrators who can run commands only at the level of the workspace. Specify these administrators in the WS Security tab, as described in "[WS Security](#)" on page C-16.

Transaction Support

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

Note: To use OracleAS Adapter for VSAM under CICS with global transactions, you must have RRS installed and configured.

To work with global transactions, set the `convertAllToDistributed` transaction environment property to `true`, as shown in the following figure:

Figure 5–3 The Properties tab

To use global transactions capability to access data on the OS/390 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, then 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, then OracleAS Adapter for VSAM can participate in a distributed transaction, as the only one-phase commit resource, if the transaction environment property *logFile* includes the keyword *NORRS*, as shown in the following figure:

Figure 5–4 The logFile Environment Property

Property	Value	
+	comm	
+	debug	
+	misc	
+	odbc	
+	oledb	
+	optimizer	
+	queryProcessor	
+	tempFeatures	
-	transactions	
	commitOnDestroy	false
	convertAllToDistributed	true
	convertAllToSimple	false
	disable2PC	false
	extendedLogging	false
	logFile	logfile,NORRS
	oleThreads	
	recoveryDelay	
	timeLimit	
	useCommitConfirmTable	false
+	tuning	

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 in the Metadata tab of Oracle Studio.

This appendix contains the following sections:

- [Metadata for the Back-end Adapter](#)
- [Metadata for the VSAM Data Source](#)

Metadata for the VSAM Data Source

Using Oracle Studio, perform the following steps to maintain the metadata for the VSAM data source:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select the computer defined in "[Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio](#)" on page 2-14.
3. Expand the **Bindings** node.
4. Expand the **NAV** binding node.
5. Expand the **Data sources** node to display the data sources.
6. Right-click the VSAM data source and select **Edit Metadata** to display the Metadata tab.
7. Right-click the required table 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:

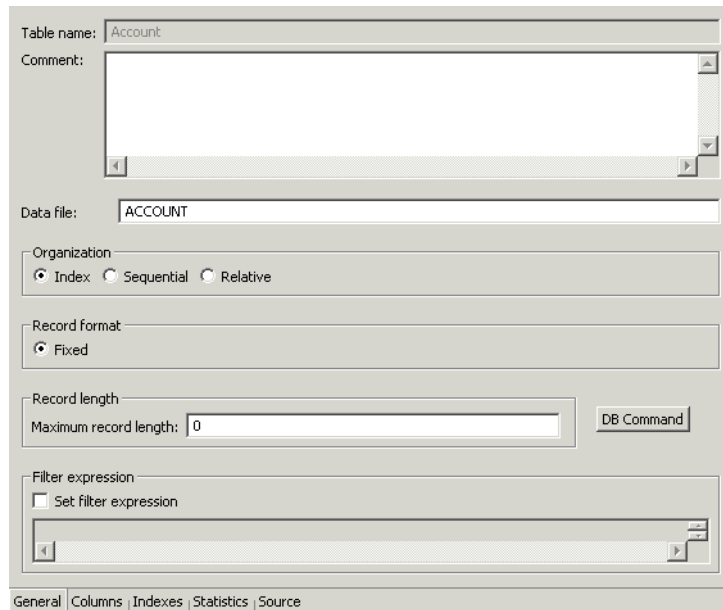
- [General Tab](#)
- [Columns Tab](#)
- [Indexes Tab](#)
- [Statistics Tab](#)
- [Source Tab](#)

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:

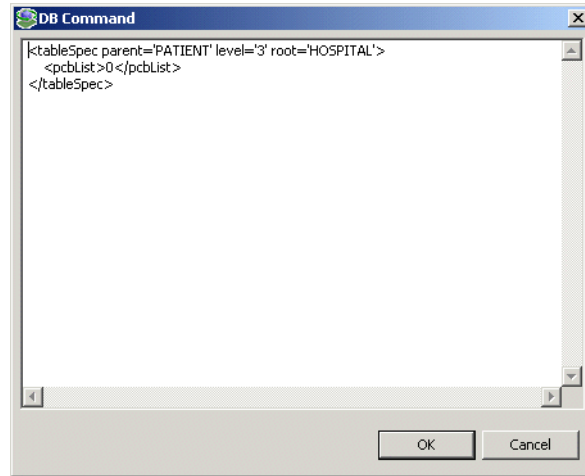
Table A-1 General tab Components

Field	Description
Table name	Specifies the name of the table.
Comment	An optional description of the table.
Data File	Specifies the location of the file containing the table.
Organization	Specifies 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 VSAM records have a fixed format.
Maximum record length	Specifies the record length.
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.

VSAM specific commands are displayed in the DB Command screen, which you open by clicking **DB Command**.

The DB Command screen is shown in the following figure:

Figure A-2 The DB Command screen

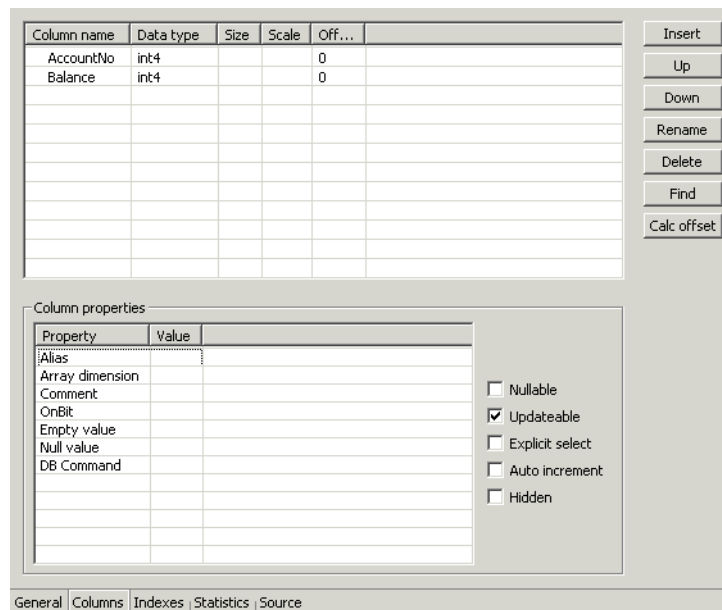


The information displayed is generated automatically when the metadata is generated and should not be modified.

Columns Tab

Use the **Columns** tab to specify metadata describing the columns of the table. The **Columns** tab is shown in the following figure:

Figure A-3 The Columns tab



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

Table A-2 Columns tab Components

Field	Description
Column Name	The name of the column.
Data Type	The data type of the data the column contains. Selecting this field displays a list of the available data types. See Also: Appendix B, "Back-end Adapter Data Type Support" for details about the available data types.
Size	The size allocated for the column.
Scale	The definition depends on the data type. For decimal data types this value 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 value is the total number of digits. The number must be negative.
Offset	An absolute offset for the field in a record. The Column Properties area relates to the selected column.
Alias	A name used to replace the default virtual table name for an array. Virtual table names are generated by appending the array name to the record name. Thus, 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 to be usable, specify an alias to replace the long name.
Array dimension	The maximum number of occurrences of the group of columns that make up the array.
Comment	A comment about the specific column.
OnBit	The position of the bit in a BIT field and the starting bit in a BITS field.
Empty value	The value for the field during an insert operation, when a value is not specified.
Null value	The null value for the field during an insert operation, when a value is not specified.
DBcommand	VSAM-specific commands for the column. The information displayed is generated automatically when the metadata is generated and should not be modified.
Nullable	Indicates the current field can contain NULL values.
Updateable	Indicates the current field can be updated.
Explicit select	The current field is not returned when you run a <code>SELECT * FROM . . .</code> statement. To return this field, you must explicitly ask for it (in a query such as <code>SELECT NATION_ID, SYSKEY FROM NATION</code> where <code>SYSKEY</code> is a field defined with Explicit Select). Note: You cannot include the asterisk (*) in a query where you want to retrieve a field defined with Explicit Select. That is, a statement such as: <code>SELECT *, SYSKEY FROM NATION</code> will not return <code>SYSKEY</code> . You can disable this attribute by specifying the <code>disableExplicitSelect</code> attribute in Oracle Studio, in the properties for the data source.

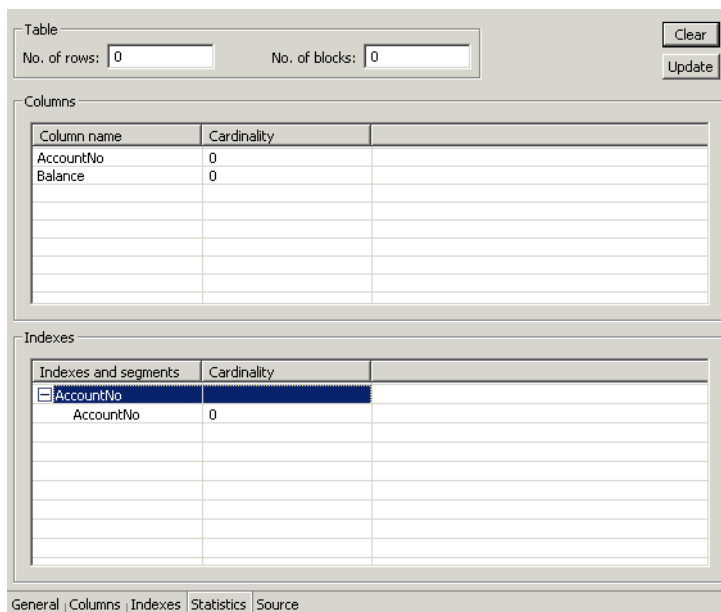
Table A-3 (Cont.) Indexes tab Components

Field	Description
Comment	An optional comment on the selected index.
Type	Indicates the type of the index. The following types are available: <ul style="list-style-type: none"> ■ Unique: Indicates that the current index is unique. ■ Clustered: Indicates that the current index is clustered. ■ Hierarchical: Indicates that the current index is hierarchical. ■ Hashed: Indicates that the current index is hashed.

Statistics Tab

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

Figure A-5 The Statistics tab



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

Table A-4 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. Warning: 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 to specify cardinality for each of the columns in the table:

Table A-5 Columns group Components

Field	Description
Column name	The column name in the table.
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 to specify cardinality for the columns in each of the indexes in the table:

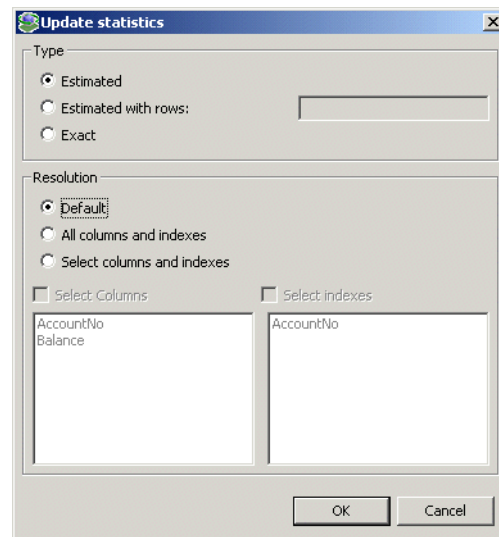
Table A-6 Indexes group Components

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-6 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-7 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.

Use the Resolution group to specify the following:

Table A-8 Resolution group Components

Field	Description
Exact	The exact statistical information returned. Note that this can be a lengthy task and can lead to disk space problems with large tables.
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).

Source Tab

The **Source** tab displays the XML representation of the metadata.

Metadata for the Back-end Adapter

Use Oracle Studio to maintain the metadata for the VSAM adapter.

Perform the following steps:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select the computer defined in "[Setting Up the IBM OS/390 or z/OS Platform in Oracle Studio](#)" on page 2-14.
3. Expand the **Bindings** node.
4. Expand the **NAV** binding node.
5. Expand the **Adapters** node to display the adapters list.
6. Right-click the VSAM adapter and select **Edit Metadata** to open the Metadata tab.
7. Right-click the required interaction 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 edit the metadata:

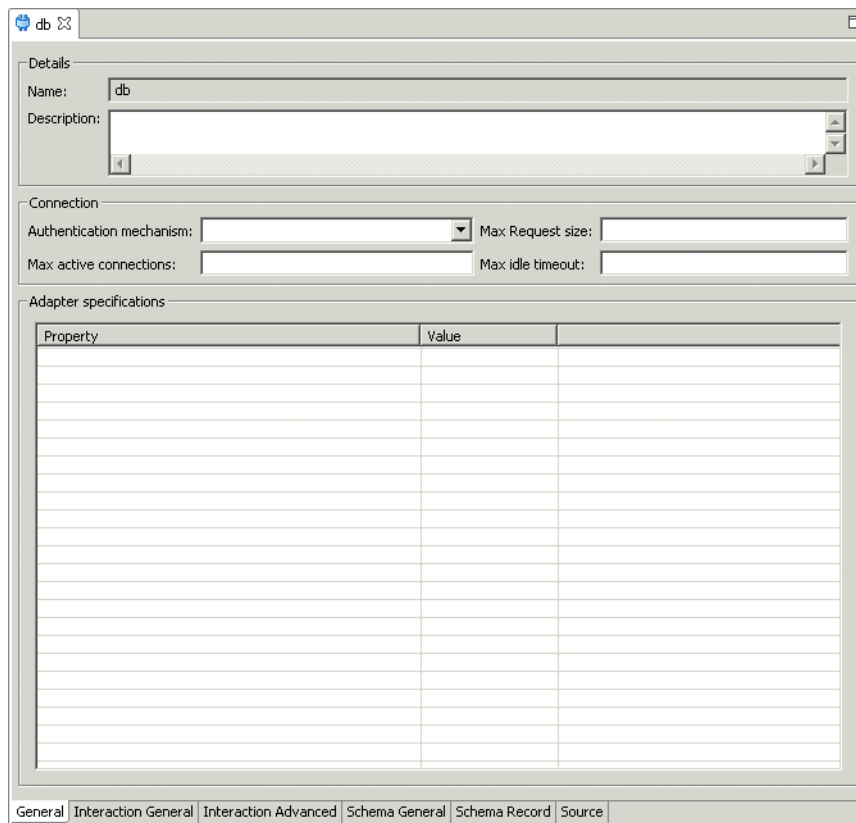
- [General Tab](#)

- [Interaction General Tab](#)
- [Interaction Advanced Tab](#)
- [Schema General Tab](#)
- [Schema Record Tab](#)
- [Source Tab](#)

General Tab

Use the **General** tab to maintain information generally describing the adapter and the connection to it. The **General** tab is shown in the following figure:

Figure A-7 The General tab



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

Table A-9 General tab Components

Field	Description
Adapter definition name	Specifies the name of the adapter definition.
Description	Specifies an identifying description of the adapter.
Authentication mechanism	Specifies the authentication to access the adapter. The available mechanisms are: kerbv5 none basic password

Table A-9 (Cont.) General tab Components

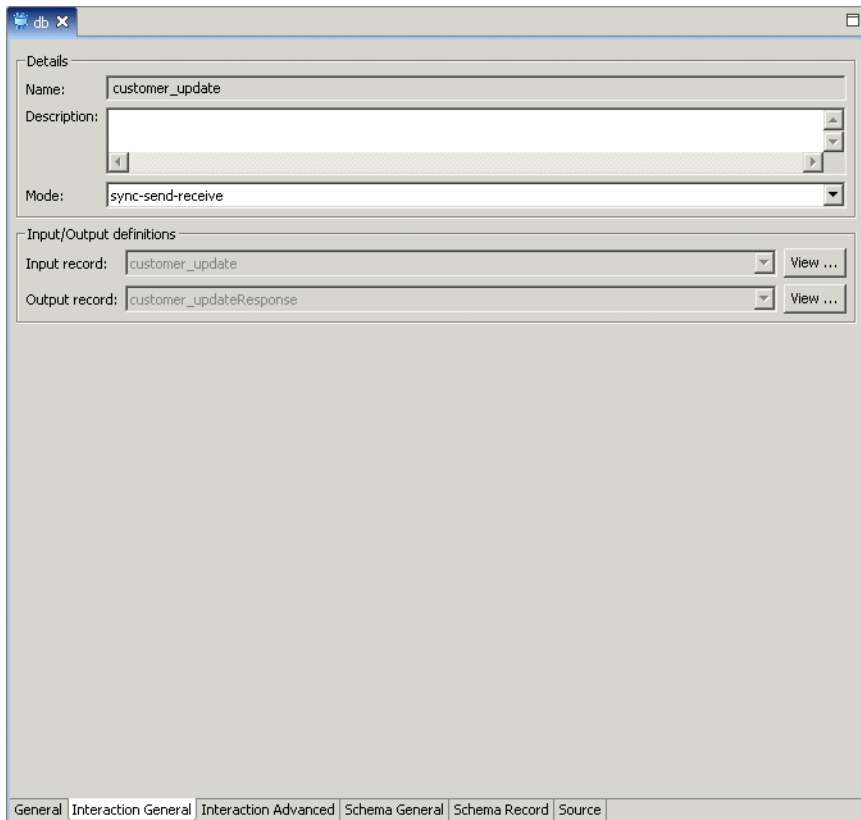
Field	Description
Max request size	Specifies the maximum size in bytes for an XML request or reply. Larger messages are rejected with an error.
Max active connections	Specifies the maximum number of simultaneous connections for an adapter (per process).
Max idle timeout	Specifies the maximum time, in 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 VSAM back-end adapter does not have any adapter-specific properties.

Interaction General Tab

Use the **Interaction General** tab to define the general details of the interaction in addition to its input and output definitions.

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

Figure A-8 The Interaction General tab



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

Table A-10 Interaction General tab Components

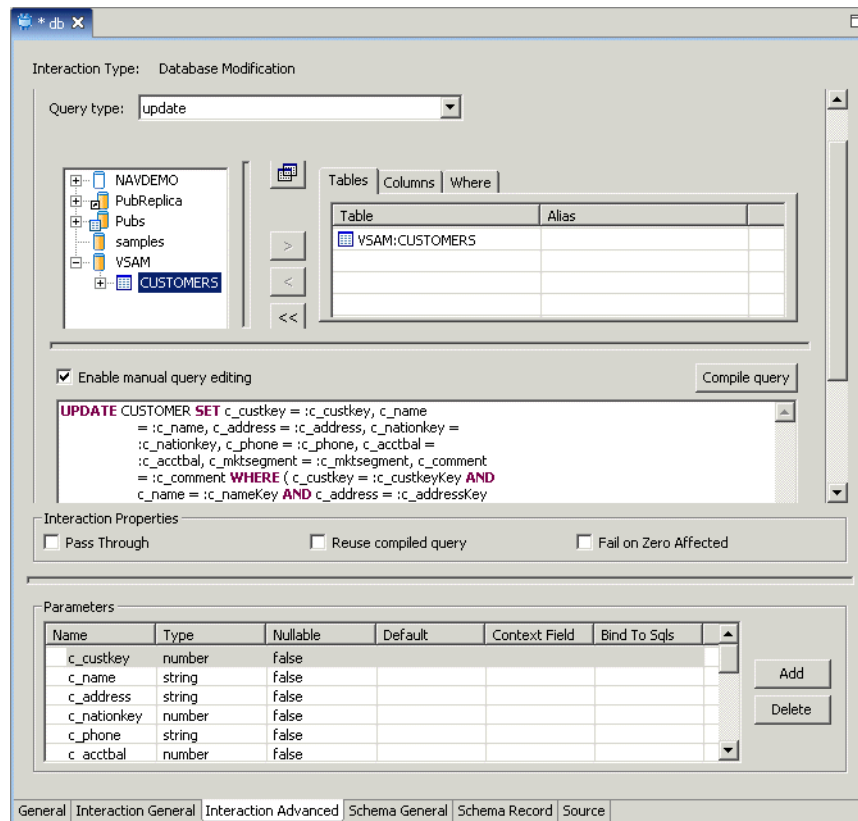
Field	Description
Interaction name	Specifies the name of the interaction.
Description	Provides a descriptive identifier for the interaction.
Mode	Determines the interaction mode. The following interaction modes are available: sync-send-receive: The interaction sends a request and expects to receive a 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.
Input record	Identifies an input record.
Output record	Identifies an output record for the results of an interaction.

Interaction Advanced Tab

Use the **Interaction Advanced** tab to define advanced interaction parameters, such as the SQL statement type and properties, manual query adjustments, and table properties.

The **Interaction Advanced** tab is shown in the following figure:

Figure A-9 The Interaction Advanced tab



The **Interaction Advanced** tab comprises fields and uses, as listed in the following table:

Table A-11 Interaction Advanced tab Components

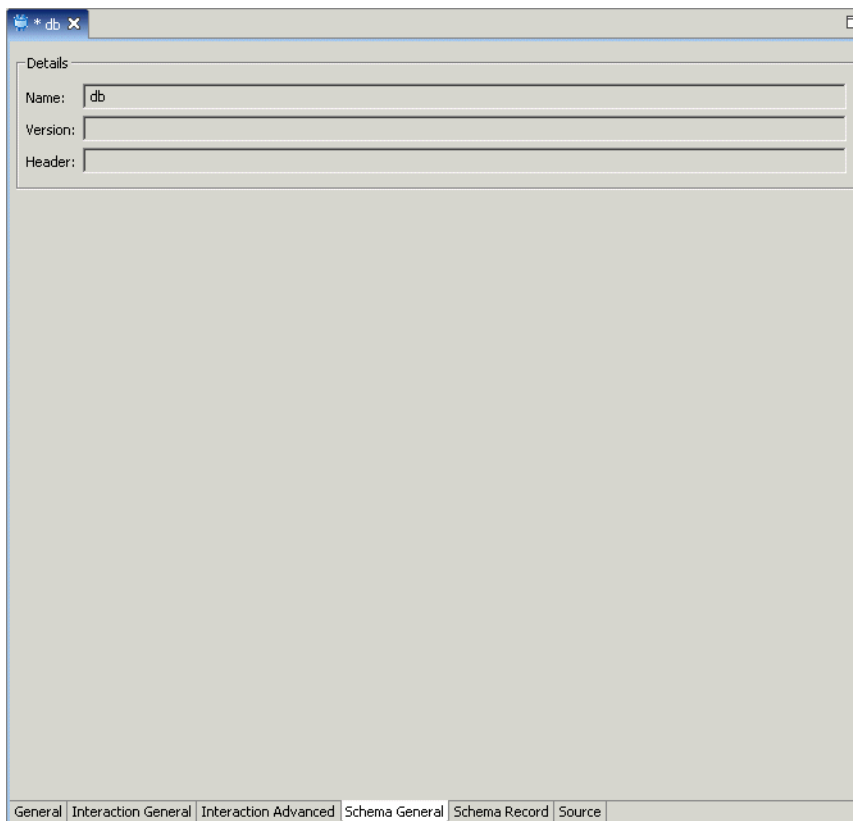
Field	Description
Query Type	The SQL statement query type.
Table/Column Definition	The SQL statement table and column selection area.
Manual Query Editing	The SQL statement manual editing area.
Interaction Properties	The interaction properties.
Parameters	The selected table fields and field parameters.

Schema General Tab

Use the **Schema General** tab to define the general details of the input and output record structures for the interaction.

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

Figure A-10 The Schema General tab



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

Table A-12 Schema General tab Components

Field	Description
Schema name	The name of the adapter.
Version	The schema version.

Table A–12 (Cont.) Schema General tab Components

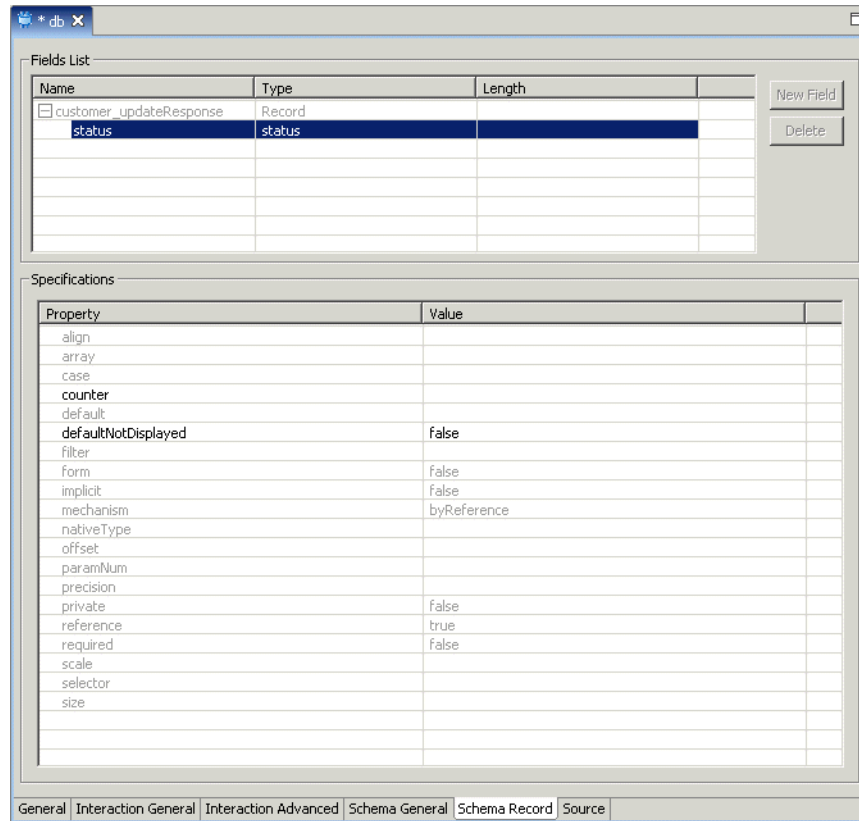
Field	Description
Header	A C header file to map between the data structure and the adapter.

Schema Record Tab

Use the **Schema Record** tab to define the input and output record structures for the interaction.

The **Schema Record** tab is shown in the following figure:

Figure A–11 The Schema Record tab



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

Use the Fields List area to define single data items within a record. The Fields List area comprises fields, as listed in the following table:

Table A–13 Schema Record tab Components

Field	Description
Name	Specifies the name of the field.

Table A–13 (Cont.) Schema Record tab Components

Field	Description
Type	The data type of the field. The following are valid data types: <ul style="list-style-type: none"> ▪ Binary ▪ Boolean ▪ Date ▪ Double ▪ Float ▪ Int ▪ Long ▪ Numeric ▪ Short ▪ String ▪ Time ▪ Timestamp ▪ XML
Length	The size of the field including a null terminator, when the data type supports null termination.

See Also: [Appendix B, "Back-end Adapter Data Type Support"](#) for details about the mapping from COBOL datatypes to VSAM back-end adapter datatypes.

Note: Use the Specifications area to specify field properties.

Source Tab

The **Source** tab displays the XML representation of the adapter metadata.

Back-end Adapter Data Type Support

OracleAS Adapters for VSAM 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 VSAM 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 5–8 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 5–8 (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:

- [Daemon Control](#)
- [Daemon Logging](#)
- [Daemon Security](#)
- [Workspaces](#)

Daemon Control

Using the **Daemon Control** tab, you define various daemon control options. The **Daemon Control** tab is accessed as follows:

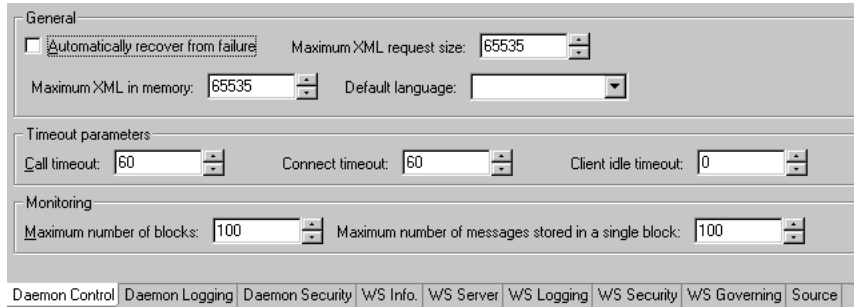
1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select the required computer from the Configuration Explorer.
3. Right-click the computer and select **Open Runtime Perspective**.
4. Right-click the required daemon in the Runtime Explorer and select **Edit Daemon Configuration**. The **Daemon Control** tab is displayed.
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 **Daemon Control** tab is shown in the following figure:

Figure 5–5 The Daemon Control tab



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

Table 5–9 Daemon Control tab Components

Field	Description
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.
Maximum XML in memory	The maximum amount of space reserved for the XML in memory.
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.
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 DESCRIBE should be completed in a few seconds as opposed to call like a GETROWS 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.

Table 5–9 (Cont.) Daemon Control tab Components

Field	Description
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>

Daemon Logging

Using the **Daemon 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 **Daemon Logging** tab is accessed as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select the required computer from the Configuration Explorer.
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 **Daemon Logging** tab.
6. After making changes to the daemon, right-click the daemon and select **Reload Configuration**.

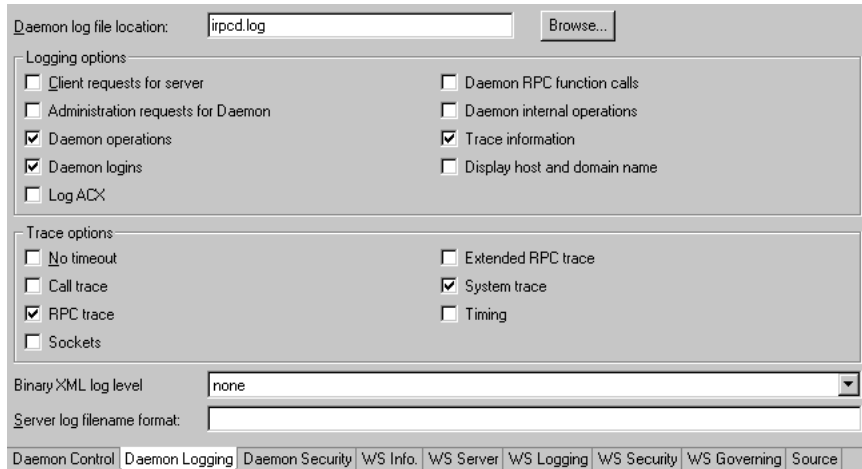
Note: You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.

Changes made to the daemon configuration are only implemented after the configuration is reloaded using the **Reload Configuration** option in the Runtime Manager perspective.

7. Right-click the daemon and select **End Unused Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **Daemon Logging** tab is shown in the following figure:

Figure 5–6 The Daemon Logging tab



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

Table 5–10 Daemon Logging tab Components

Field	Description
Daemon log file location	Specifies the daemon produces its log data. The full path must be specified.
Logging options	Specifies what tracing is performed.
Client requests for server	Logs client requests for server activations; this provides logging of the process IDs of the started servers along with the location of the log files.
Administration requests for daemon	Logs all of the administration requests for the daemon.
Daemon operations	Logs all of the daemon operations.
Daemon logins	Logs daemon logins.
Daemon RPC function calls	Logs all daemon RPC function calls.
Daemon internal operations	Logs daemon internal operations.
Log trace information	Logs low-level RPC operations.
Display host and client domain name	Specifies whether the client host and domain name are logged rather than the client IP address. The default is false.
Trace options	Specifies the type of tracing being performed.
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.
Sockets	Generates a message in the server log file for each socket operation.
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.

Table 5–10 (Cont.) Daemon Logging tab Components

Field	Description
System trace	Generates system-specific tracing of various operations.
Timing	Generates a timestamp for every entry to the server log file.
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
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.

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.

Daemon Security

The **Daemon Security** tab is used to:

- Grant administration rights for the daemon.
- Determine access to the computer.

The **Daemon Security** tab is accessed as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select the required computer from the Configuration Explorer.
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 **Daemon Security** tab.
6. After making changes to the daemon, right-click the daemon and select **Reload Configuration**.

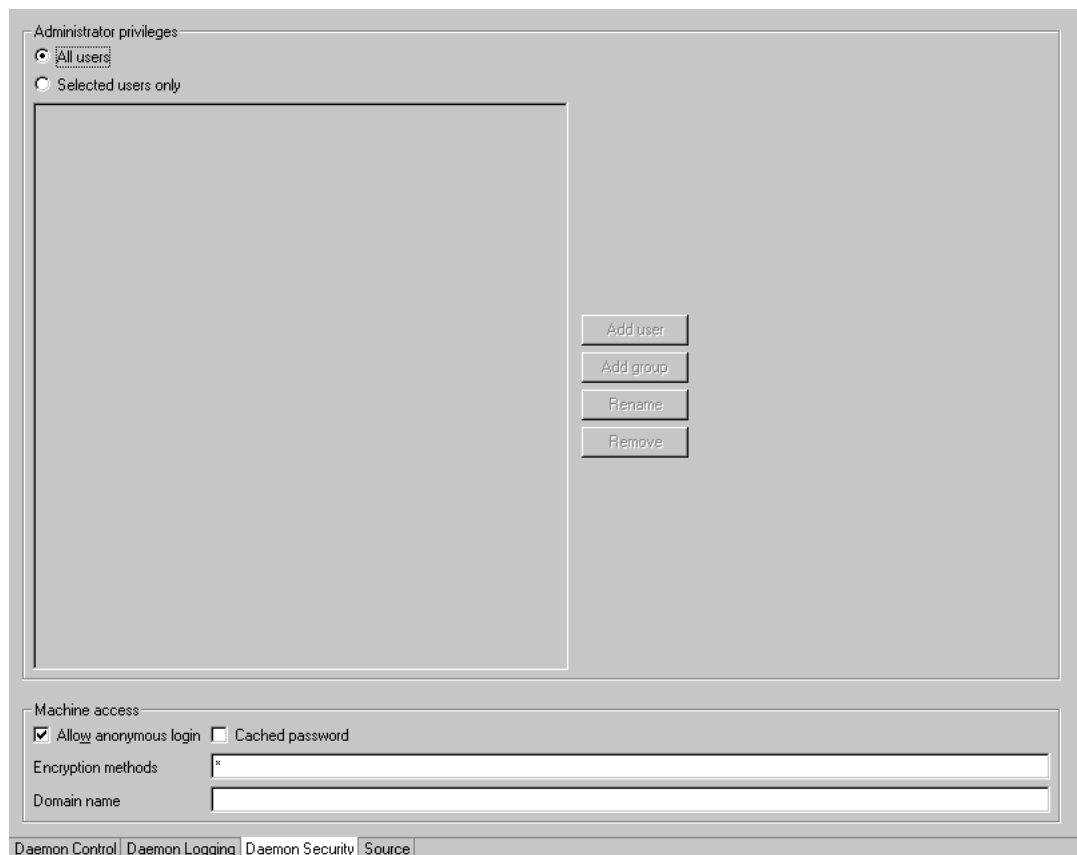
Note: You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.

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 **End Unused 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 5–7 The Daemon Security tab



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

Table 5–11 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.

Table 5–11 (Cont.) Daemon Security tab Components

Field	Description
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:

- [WS Info.](#)
- [WS Server](#)
- [WS Logging](#)
- [WS Security](#)
- WS Governing: This tab is not applicable for use with OracleAS Adapters for VSAM

WS Info.

Using the **WS Info.** tab, you specify 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.

The **WS Info.** tab is accessed as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select the required computer from the Configuration Explorer.
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**. 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 **End Unused Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **WS Info.** tab is shown in the following figure:

Figure 5–8 The WS Info tab

The **WS Info.** tab comprises fields, as listed in the following table:

Table 5–12 WS Info 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.

Table 5–12 (Cont.) WS Info tab Components

Field	Description
Server type	This field is not applicable for use with OracleAS Adapters for VSAM.
Workspace binding name	This field is not applicable for use with OracleAS Adapters for VSAM.
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: " Daemon Control " on page C-1 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.

WS Server

Using the **WS Server** tab, you specify 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.

The **WS Server** tab is accessed as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select the required computer from the Configuration Explorer.
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 **WS Server** 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 **End Unused Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **WS Server** tab is shown in the following figure:

Figure 5–9 The WS Server tab

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

Table 5–13 WS Server 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 VSAM. ■ <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 5–13 (Cont.) WS Server 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 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.

Table 5–13 (Cont.) WS Server tab Components

Field	Description
resource limitations	<p>Specifies the number of servers that can be in use at any one time. The more servers used, the greater the system resources that are used.</p> <p>The following options are available:</p> <ul style="list-style-type: none"> ■ Number of subtasks: The number of subtasks for a server that are prestarted for this workspace when the daemon starts up. Thus, setting 10 prestarted servers and 10 subtasks results in 100 tasks started (10 subtasks for each process). ■ Limit number of active servers: The maximum number of active server processes (either available or in use). Once reached, no new server processes will be created for the particular workspace and client connections would be rejected if there is no available server to accept them. Once the number of active servers drops below the maximum (for example, a client disconnects from a server and the server terminates), new servers can again be started. If the value of this field is set to a nonzero value lower than the value for the Initial number of servers field, the daemon assumes it is set to the same value as the Initial number of servers field. The default for this field is 0, meaning that no maximum is enforced.
Server Priority	<p>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.</p> <p>The following priority options are available:</p> <ul style="list-style-type: none"> ■ Use default priority: Sets the priority as 0. There is no specific priority for this workspace. ■ Use priority: Enables setting the priority.

WS Logging

Using the **WS Logging** tab, you specify parameters to log, that occur with the workspace server process.

The **WS Logging** tab is accessed as follows:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select the required computer from the Configuration Explorer.
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 WS Logging tab.
7. 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.

8. Right-click the daemon and select **End Unused Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **WS Logging** tab is shown in the following figure:

Figure 5–10 The WS Logging tab

The screenshot shows the WS Logging tab configuration window. At the top, there is a checked checkbox for 'Specific log file format:' followed by a text box containing 'Nav_%.i.log'. Below this is a section titled 'Trace options' containing several checkboxes: 'No timeout', 'Call trace', 'RPC trace', 'Sockets', 'Extended RPC trace', 'System trace' (which is checked), and 'Timing'. The next section is 'Event Information:', which is divided into four sub-sections: 'Logging' with radio buttons for 'none' (selected), 'error', and 'debug'; 'Server' with checkboxes for 'Connect' and 'Disconnect'; 'Client' with checkboxes for 'Connect' and 'Disconnect'; and 'Audit' with radio buttons for 'None' (selected), 'Statistics', 'Headers', and 'Detailed'.

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

Table 5–14 WS Logging 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: 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. ■ Sockets: Generates 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: 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 operating system-specific tracing. ■ Timing: Generates a timestamp for every entry to the server log file.
Logging	<p>Specifies the level of events that are logged for the workspace. The following event levels are available:</p> <ul style="list-style-type: none"> ■ none: The event log only displays the IP addresses of client that have logged in and out from the workspace. ■ error: The event log displays the IP addresses of client that have logged in and out from the workspace as well as any errors that have been generated. ■ debug: The event log displays the IP addresses of client that have logged in and out from the workspace as well as any errors that have been generated and all trace results that were specified in the Daemon Logging tab.

Table 5–14 (Cont.) WS Logging tab Components

Field	Description
Server	Specifies the server connection events to log. The following server events are available: <ul style="list-style-type: none"> ■ Connect: The event log displays the server connection events. ■ Disconnect: The event log displays the server disconnect events.
Client	Specifies the type of tracing performed. The following client events are available: <ul style="list-style-type: none"> ■ Connect: The event log displays the client connection events. ■ Disconnect: The event log displays the client disconnect events.
Audit	This group is not applicable for use with OracleAS Adapter for VSAM.

WS Security

Using the **WS Security** tab, you specify the level of security at the workspace level, as opposed to the daemon level, which is set in the **Daemon Security** tab.

See Also: "[Daemon Security](#)" on page C-5 for details about security.

The **WS Security** tab is used to:

- Grant administration rights for the workspace
- Determine access to the workspace by a client

The **WS Security** tab is accessed as follows:

1. From the **Start** menu, select **Programs, Oracle, and then select Studio**.
2. Select the required computer from the Configuration Explorer.
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 **WS Security** tab.
7. After making changes to the workspace, right-click the daemon and select **Reload Configuration**.

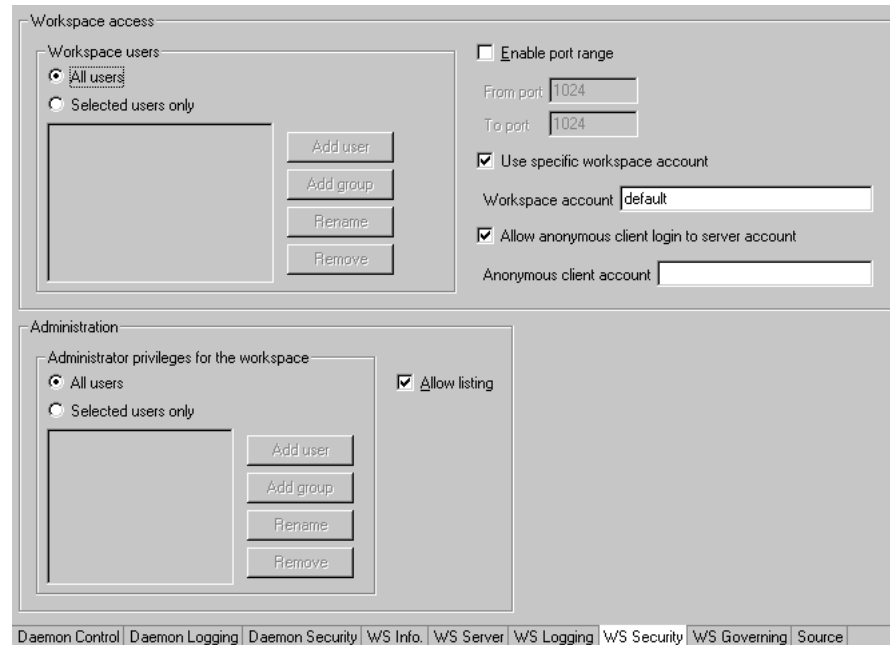
Note: You can also change daemon settings using the Configuration Explorer, by selecting a computer and scrolling the list to the required daemon. Right-click the daemon and select **Edit Daemon**.

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.

8. Right-click the daemon and select **End Unused Servers**. Any servers in the connection pool are closed and new servers start with the new configuration.

The **WS Security** tab is shown in the following figure:

Figure 5–11 The WS Security tab



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

Table 5–15 WS Security tab Components

Field	Description
Administration	Defines the users (accounts) allowed to perform administrative tasks (tasks that require administrative login) on this workspace.
Administrator privileges	Identifies the users (accounts) with administrator privileges. The following options are available: <ul style="list-style-type: none"> All users: Indicates that anyone can access the workspace and change the settings. Selected users only: The names of users (accounts) and groups that can be administrators. <p>Note: If a user is not specified here, the user specified in the Workspace users area will have administrator rights for this workspace. In this case, if all users are selected for the Workspace users area, then all users have administrator rights for this workspace.</p> Allow Listing: Determines whether this workspace appears in the list of workspaces.
Workspace account	Defines the users (accounts) allowed to access the workspace, firewall access ports, workspace account, and anonymous login permissions.

Table 5–15 (Cont.) WS Security tab Components

Field	Description
Workspace users	<p data-bbox="610 268 1179 298">Lists the users who are allowed to use the workspace.</p> <ul data-bbox="610 310 1227 955" style="list-style-type: none"><li data-bbox="610 310 1227 365">■ All users: Indicates that any user who has logged on to the daemon can use the workspace.<li data-bbox="610 373 1227 428">■ Selected users only: Specifies users (accounts) and groups that can use the workspace. Note: If a user is not specified, any user who has logged on to the daemon can use the workspace.<li data-bbox="610 508 1227 667">■ Enable ports range: Defines the firewall ports through which you access the workspace. Specifies 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.<li data-bbox="610 676 1227 785">■ Use specific workspace account: Defines the operating system account used for the workspace. If not specified, the account name that was provided by the client is used.<li data-bbox="610 793 1227 955">■ Allow anonymous client login to server account: Defines whether this workspace can be accessed without authentication (user name/password). If anonymous login is allowed, specify the server account name to use. If this field is not specified, then the value in the Workspace account field is used.

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

OracleAS Adapters for VSAM 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

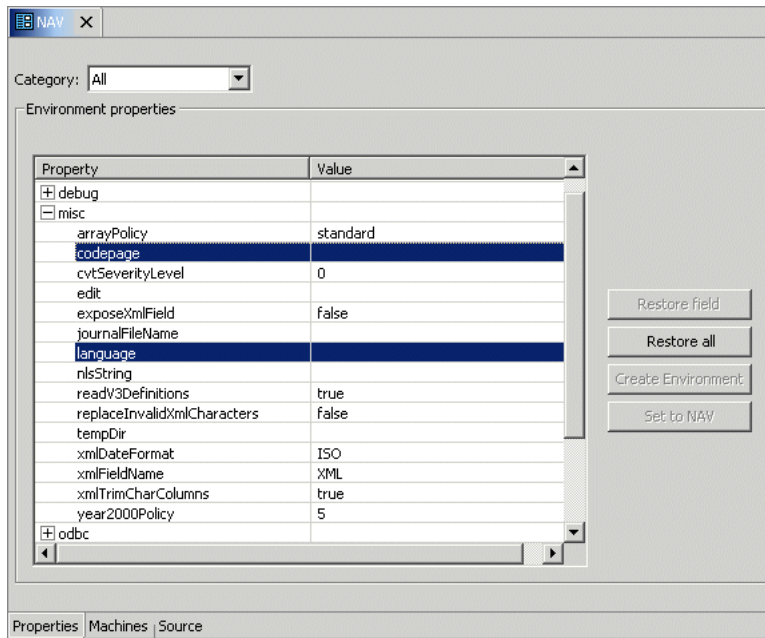
The language and codepage parameters are accessed from the computer where Oracle Studio is installed.

Perform the following steps to define the required language and codepage:

1. From the **Start** menu, select **Programs, Oracle**, and then select **Studio**.
2. Select and expand the required computer node from the Configuration Explorer.
3. Expand the Binding node.
4. Right-click **NAV** and select **Edit Binding**.
5. In the binding **Properties** tab, expand the **misc** node.

The NAV binding **Properties** tab is shown in the following figure:

Figure 5–12 The Properties tab



6. Enter a valid value for the language. See [NLS Language Codes](#)
7. Optionally, in the **codepage** field, specify the codepage required.

You can skip this step, and specify a language (see the previous step). In this case, a default codepage is used.

The following table lists the codepages:

Table 5–16 NLS Language Codes

Language Name	Language Code	ASCII Platforms (Default)	EBCDIC Platforms (Default)	Alternative Codepages (EBCDIC based unless noted otherwise)
Arabic	ARA	ISO-8859-6	IBM420	Windows-1256 (ASCII based)
Chinese - Simplified	SCHI	GB2312	IBM935	-
Chinese - Traditional	TCHI	BIG5	IBM937	-
English UK	ENUK	ISO-8859-15	IBM1146	IBM037, IBM500, IBM1140, IBM1148 ISO-8859-1 (ASCII based)
English US	ENUS	ISO-8859-15	IBM1140	IBM500, IBM1148 ISO-8859-1 (ASCII based)
French	FRE	ISO-8859-15	IBM1147	IBM037, IBM500, IBM1140, IBM1148 ISO-8859-1 (ASCII based)

Table 5–16 (Cont.) NLS Language Codes

Language Name	Language Code	ASCII Platforms (Default)	EBCDIC Platforms (Default)	Alternative Codepages (EBCDIC based unless noted otherwise)
German	GER	ISO-8859-15	IBM1141	IBM037, IBM500, IBM1140, IBM1148 ISO-8859-1 (ASCII based)
Greek	GRK	ISO-8859-7	IBM875	-
Hebrew	HEB	ISO-8859-8	IBM424	-
Italian	ITL	ISO-8859-15	IBM1144	IBM037, IBM500, IBM1140, IBM1148 ISO-8859-1 (ASCII based)
Japanese	JPN	SJIS EUC (Solaris) VMS-JP (VMS)	IBM939	-
Korean	KOR	KSC5601 MS949 (Win)	IBM933	MS949, EUC-KR (both ASCII based)
Latin International	LAT	ISO-8859-15	IBM1148	IBM037, IBM1140 ISO-8859-1 (ASCII based)
Portuguese	POR	ISO-8859-15	IBM1140	IBM500, IBM1148 ISO-8859-1 (ASCII based)
Russian	RUS	ISO-8859-5	IBM1154	-
Spanish	SPA	ISO-8859-15	IBM1145	IBM037, IBM500, IBM1140, IBM1148 ISO-8859-1 (ASCII based)
Turkish	TUR	ISO-8859-9	IBM1155	IBM857

A

acxTrace parameter, 5-6
advanced interaction parameters, A-11
analyzerQueryPlan parameter, 5-6
application language parameter, 5-6
arithmetic operators, D-1
arrays, flattening hierarchical data, D-4

B

buffer size, comCacheBufferSize parameter, 5-5
Business Objects, qualifying catalog and tables
 names, 5-8

C

cache
 dsmMaxBufferSize parameter, 5-9
 maximum queries, 5-8
CD-ROM drive requirements
 IBM S/390, 2-2
 PC, 2-2
codepage parameter, 5-6
comCacheBufferSize parameter, 5-5
comm parameters
 comCacheBufferSize, 5-5
 comMaxSocketSize, 5-5
 comMaxXmlSize, 5-5
comMaxSocketSize parameter, 5-5
comMaxXmlSize parameter, 5-5
comparison operators, D-1
compileAfterLoad parameter, 5-8
compiling
 procedures, 5-8
 views, 5-8
cvtSeverityLevel parameter, 5-6

D

daemon
 logging, C-3
 security, C-5
 server modes, 5-2
 shutting down, 4-2
 starting, 4-1
 timeout, 4-6

data sources, disabling caching, 5-8
data types
 atomic metadata, B-1
 cvtSeverityLevel, 5-6
 nlsString, 5-7
debug parameters
 acxTrace, 5-6
 analyzerqueryPlan, 5-6
 environment, 5-5
 generalTrace, 5-6
 logFile, 5-6
 oledbTrace, 5-6
 optimizerTrace, 5-6
 queryWarnings, 5-6
 traceDir, 5-6
disabling
 parallel processing, 5-8
 parameterization of constants, 5-8
 pooling, 5-8
 read-ahead functionality, 5-8
disk space requirements
 IBM S/390, 2-2
 PC, 2-2
dsmMaxBufferSize parameter, 5-9
dsmMaxSortBufferSize parameter, 5-10
dsmMidBufferSize parameter, 5-10
dsoThreadingBoth parameter, 5-8

E

edit parameter, 5-6
emptyStringIsNull parameter, 5-8
environment parameters
 acxTrace, 5-6
 analyzerQueryPlan, 5-6
 codepage, 5-6
 comCacheBufferSize, 5-5
 comMaxSocketSize, 5-5
 comMaxXmlSize, 5-5
 compileAfterLoad, 5-8
 cvtSeverityLevel, 5-6
 debug, 5-5
 dsmMaxBufferSize, 5-9
 dsmMaxSortBufferSize, 5-10
 dsmMidBufferSize, 5-10
 dsoThreadingBoth, 5-8

- edit, 5-6
- emptyStringIsNull, 5-8
- firstTreeExtensions, 5-8
- forceQualifiedNames, 5-8
- generalTrace, 5-6
- goal, 5-7
- hashBufferSize, 5-10
- hashEnableParallelism, 5-10
- hashMaxDiskSpace, 5-10
- hashMaxOpenFiles, 5-10
- ignoreSegmentBindFailure, 5-8
- language, 5-6
- logFile, 5-6
- maxColumnsInParsing, 5-8
- maxSqlCache, 5-8
- miscellaneous, 5-6
- nlsString, 5-7
- noCommandReuse, 5-8
- noCompilationCache, 5-8
- noDSPROPERTYCache, 5-8
- noInsertParameterization, 5-8
- noMarkRowFailedFetch, 5-8
- noMetadataCaching, 5-8
- noParallelExecution, 5-8
- noQueryParameterization, 5-8
- noQueryReadAhead, 5-8
- noSessionPooling, 5-8
- noSQSCache, 5-8
- noThreadedReadAhead, 5-8
- noThreads, 5-8
- noTreeAutoExtend, 5-9
- odbc, 5-7
- oledb, 5-7
- oledbTrace, 5-6
- optimisticForUpdate, 5-9
- optimizer, 5-7
- optimizerTrace, 5-6
- parserDepth, 5-9
- proceduresCacheSize, 5-9
- promptDbUserPassword, 5-9
- queryProcessor, 5-8
- queryWarnings, 5-6
- tempDir, 5-7
- tokenSize, 5-9
- traceDir, 5-6
- transactions, 5-9
- tuning, 5-9
- useAlternateQualifier, 5-9
- useTableFilterExpressions, 5-9
- year2000Policy, 5-7

error log

- logFile parameter, 5-6

F

- first row optimization, goal parameter, 5-7
- firstTreeExtensions parameter, 5-8
- forceQualifiedNames parameter, 5-8
- functions
 - group, D-2

- string, D-2

G

- generalTrace parameter, 5-6
- goal parameter, 5-7
- group functions, D-2

H

- hardware requirements
 - IBM S/390 CD-ROM drive, 2-2
 - IBM S/390 disk space, 2-2
 - IBM S/390 memory, 2-2
 - PC CD-ROM drive, 2-2
 - PC disk space, 2-2
 - PC memory, 2-2
 - PC processor, 2-2
 - UNIX, 2-2
- hash disk space, 5-10
- hash joins, 5-10
- hash memory, 5-10
- hashBufferSize parameter, 5-10
- hashEnableParallelism parameter, 5-10
- hashMaxDiskSpace parameter, 5-10
- hashMaxOpenFiles parameter, 5-10
- hierarchical queries, D-4

I

- IBM S/390
 - installing, 2-5
 - postinstallation, 2-9
 - preinstallation, 2-4
- ignoreSegmentBindFailure parameter, 5-8
- importing installation kit, 2-5
- index cache
 - dsmMidBufferSize parameter, 5-10
- installation kit, importing, 2-5
- installing
 - IBM S/390, 2-5
 - Windows, 2-13
- integration flow, Oracle Application Server to legacy application, 1-3
- interaction parameters, advanced, A-11

J

- joins
 - hashBufferSize parameter, 5-10
 - hashEnableParallelism parameter, 5-10
 - hashMaxDiskSpace parameter, 5-10
 - hashMaxOpenFiles parameter, 5-10

L

- language parameter, 5-6
- locking, optimistic, 5-9
- log files
 - daemon options, C-3
 - logFile parameter, 5-6

- logFile parameter, 5-6
- logging
 - daemon configurations, C-3
 - optimizer strategy, 5-6
 - trace information, 5-6

M

- maxColumnsInParsing parameter, 5-8
- maximum size, XML documents, 5-5
- maxSqlCache parameter, 5-8
- memory
 - dsmMaxBufferSize parameter, 5-9
 - dsmMaxSortBufferSize parameter, 5-10
 - dsmMidBufferSize parameter, 5-10
 - PC requirements, 2-2
- memory requirements
 - IBM S/390 requirements, 2-2
- metadata
 - atomic data types, B-1
 - disabling retrieval from cache, 5-8
- Microsoft software requirements, 2-3
- miscellaneous parameters
 - codepage, 5-6
 - cvtSeverityLevel, 5-6
 - edit, 5-6
 - environment, 5-6
 - language, 5-6
 - nlsString, 5-7
 - tempDir, 5-7
 - year2000Policy, 5-7
- multithreading, disabling, 5-8

N

- NAV_UTIL, text editor, 5-6
- nlsString parameter, 5-7
- noCommandReuse parameter, 5-8
- noCompilationCache parameter, 5-8
- noDSPropertyCache parameter, 5-8
- noInsertParameterization parameter, 5-8
- noMarkRowFailedFetch parameter, 5-8
- noMetadataCaching parameter, 5-8
- noParallelExecution parameter, 5-8
- noQueryParameterization parameter, 5-8
- noQueryReadAhead parameter, 5-8
- noSessionPooling parameter, 5-8
- noSQSCache parameter, 5-8
- noThreadedReadAhead parameter, 5-8
- noThreads parameter, 5-8
- noTreeAutoExtend parameter, 5-9

O

- odbc environment parameters, 5-7
- oledb environment parameters, 5-7
- oledbTrace parameter, 5-6
- operating system requirements
 - PC, 2-3
 - UNIX, 2-2
- optimisticForUpdate parameter, 5-9

- optimizer
 - goal parameter, 5-7
 - traceDir parameter, 5-6
 - writing plan to file, 5-6
- optimizer environment parameters, 5-7
- optimizerTrace parameter, 5-6
- Oracle Application Server requirements, 2-2

P

- parallel processing, disabling, 5-8
- parameterization of constants, disabling, 5-8
- parserDepth parameter, 5-9
- password, setting automatic prompt, 5-9
- pooling, disabling, 5-8
- postinstallation, IBM S/390, 2-9
- preinstallation, IBM S/390, 2-4
- proceduresCacheSize parameter, 5-9
- processor requirements
 - PC, 2-2
 - UNIX, 2-2
- promptDbUserPassword parameter, 5-9

Q

- queries
 - disabling parallel processing, 5-8
 - disabling parameterization of constants, 5-8
 - disabling read-ahead functionality, 5-8
 - disabling reuse, 5-8
 - disabling saved compilation, 5-8
 - enabling retrieval after failure, 5-8
 - maximum cached in memory, 5-8
 - maximum length of string, 5-9
 - maximum size after compilation, 5-8
- query optimizer
 - goal parameter, 5-7
 - logging strategy, 5-6
 - traceDir parameter, 5-6
 - writing plan to file, 5-6
- query processor
 - compileAfterLoad parameter, 5-8
 - dsoThreadingBoth parameter, 5-8
 - emptyStringISNull parameter, 5-8
 - environment parameters, 5-8
 - queryWarnings parameter, 5-6
- queryProcessor parameters
 - firstTreeExtensions, 5-8
 - forceQualifiedNames, 5-8
 - ignoreSegmentBindFailure, 5-8
 - maxColumnsInParsing, 5-8
 - maxSqlCache, 5-8
 - noCommandReuse, 5-8
 - noCompilationCache, 5-8
 - noDSPropertyCache, 5-8
 - noInsertParameterization, 5-8
 - noMarkRowFailedFetch, 5-8
 - noMetadataCaching, 5-8
 - noParallelExecution, 5-8
 - noQueryParameterization, 5-8

- noQueryReadAhead, 5-8
- noSessionPooling, 5-8
- noSQSCache, 5-8
- noThreadedReadAhead, 5-8
- noThreads, 5-8
- noTreeAutoExtend, 5-9
- optimisticForUpdate, 5-9
- parserDepth, 5-9
- proceduresCacheSize, 5-9
- promptDbUserPassword, 5-9
- tokenSize, 5-9
- useAlternatequalifier, 5-9
- useTableFilterExpressions, 5-9

queryWarnings parameter, 5-6

R

- read-ahead functionality, disabling, 5-8
- reading from disk, 5-8
- requirements
 - PC hardware requirements, 2-2
 - PC software requirements, 2-2
 - UNIX hardware requirements, 2-1
 - UNIX software requirements, 2-2
- row optimization, goal parameter, 5-7

S

- security
 - daemon configurations, C-5
 - setting automatic prompt, 5-9
- segmented data sources, response upon failure, 5-8
- servers
 - configuring modes, 5-2
 - reusable, 5-3
 - Reuse limit daemon parameter, C-11
 - ReuseLimit daemon parameter, 5-3
- sessions, disabling pooling, 5-8
- setting up VSAM, 2-18
- SMS
 - See* system managed storage
- sockets, comMaxSocketSize parameter, 5-5
- software requirements
 - Microsoft, 2-3
 - Oracle Application Server, 2-2
 - PC operating system, 2-3
 - UNIX operating system, 2-2
- sort buffer, dsmMaxSortBufferSize parameter, 5-10
- SQL, flattening hierarchical data, D-4
- stored queries, maximum in cache memory, 5-9
- string functions, D-2
- system managed storage, 2-4

T

- tempDir parameter, 5-7
- temporary files, 5-7
- threading model, 5-8
- timeout
 - client idle, 4-6
 - daemon, 4-6

- tokenSize parameter, 5-9
- trace information, logging, 5-6
- traceDir parameter, 5-6
- transactions environment parameters, 5-9
- tuning parameters
 - dsmMaxBufferSize, 5-9
 - dsmMaxSortBufferSize, 5-10
 - dsmMidBufferSize, 5-10
 - environment, 5-9
 - hashBufferSize, 5-10
 - hashenableParallelism, 5-10
 - hashMaxDiskSpace, 5-10
 - hashMaxOpenFiles, 5-10

U

- useAlternatequalifier parameter, 5-9
- useTableFilterExpressions parameter, 5-9

V

- views, 5-8
- views, setting to compile, 5-8
- VSAM, setting up, 2-18

W

- Windows, installing, 2-13
- Workspace server mode, C-11

X

- XML documents, maximum size, 5-5

Y

- Y2K
 - See* year2000Policy parameter
- year2000Policy parameter, 5-7