

**Oracle Procedural Gateway® for APPC**

Installation and Configuration Guide

10g Release 2 (10.2) for Microsoft Windows

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Oracle Procedural Gateway for APPC Installation and Configuration Guide, 10g Release 2 (10.2) for Microsoft Windows

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# Preface

The Oracle Procedural Gateway for APPC provides Oracle applications with seamless access to IBM mainframe data and services through Remote Procedure Call (RPC) processing.

Refer to the *Oracle Database Installation Guide 10g Release 2 (10.2)* for Microsoft Windows and to the certification matrix on the *OracleMetaLink* Web site for the most up-to-date list of certified hardware platforms and operating system versions. The *OracleMetaLink* Web site can be found at:

<http://metalink.oracle.com>

## Audience

Read this guide if you are responsible for tasks such as:

- determining hardware and software requirements
- installing, configuring, or administering an Oracle Procedural Gateway for APPC
- developing applications that access remote host databases through the gateway using either the SNA communication protocol or the TCP/IP for IMS Connect communication protocol.
- determining security requirements
- determining and resolving problems

Before using this guide to administer the gateway, you should understand the fundamentals of the Windows operating system, SNA Server, the Procedural Gateways, PL/SQL and the Oracle Integrating Server.

## Documentation Accessibility

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## Related Documents

The *Oracle Procedural Gateway for APPC Installation and Configuration Guide for Microsoft Windows* is included as part of your product shipment. Also included is:

- *Oracle Procedural Gateway for APPC Messages Guide for UNIX and Microsoft Windows*
- *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows*

You might also need Oracle server and Oracle Net documentation. The following is a useful list of the Oracle publications that may be referenced in this book:

- *Oracle Database Installation Guide for Microsoft Windows (32-Bit)*
- *Oracle Database Administrator's Guide*
- *Oracle Database Application Developer's Guide - Fundamentals*
- *Oracle Database Concepts*
- *Oracle Database Error Messages*
- *Oracle Database Net Services Administrator's Guide*

Other related publications are listed in "[Documentation Requirements](#)" on page 3-4. Refer to the *Oracle Technical Publications Catalog and Price Guide* for a complete list of documentation provided for Oracle products.

## Conventions

Examples of input and output for the gateway and Oracle environment are shown in a special font:

```
C:\> mkdir \ORACLE\your_name
```

All output is shown as it appears. For input, the list of conventions and their meanings are as follows:

- **example text:** Words or phrases, such as `mkdir` and `ORACLE`, must be entered exactly as spelled and in the letter case shown. In this example, `mkdir` must be entered in lowercase letters and `ORACLE` in uppercase letters.
- **italic text:** Italicized uppercase or lowercase, such as *your\_name*, indicates that you must substitute a word or phrase, such as the actual directory name.

- **BOLD text** or *bold italic TEXT*: Bold words or phrases refer to a file or directory structure, such as a directory, path, or file ID.
- ... : Ellipses indicate that the preceding item can be repeated. You can enter an arbitrary number of similar items.
- { }: Curly braces indicate that one of the enclosed arguments is required. Do not enter the braces themselves.
- | : Vertical lines separate choices.
- [ ]: Square brackets enclose optional clauses from which you can choose one or none. Do not enter the brackets themselves.

Other punctuation, such as commas, quotation marks or the pipe symbol (|) must be entered as shown unless otherwise specified. Directory names, file IDs and so on appear in the required letter case in examples. The same convention is used when these names appear in text, and the names are highlighted in **bold**. The use of *italics* indicates that those portions of a file ID that appear in *italics* can vary.

Gateway commands, file IDs reserved words, MS-DOS commands, keywords and environment variables appear in uppercase in examples and text. Reserved words must always be entered as shown; they have reserved meanings within the Oracle system.

### **SQL\*Plus Prompts**

The SQL\*Plus prompt, SQL>, appears in SQL statement and SQL\*Plus command examples. Enter your response at the prompt. Do not enter the text of the prompt, SQL>, in your response.

### **MS-DOS Prompts**

The MS-DOS prompt, C:\>, appears in MS-DOS command examples. Enter your response at the prompt. Do not enter the text of the prompt, C:\>, in your response.

### **PGAU Prompts**

The PGAU prompt, PGAU>, appears in PGAU command examples. Enter your response at the prompt. Do not enter the text of the prompt, PGAU>, in your response.

### **Directory Names**

Throughout this document, there are references to the directories in which product-related files reside. %ORACLE\_HOME% is used to represent the Oracle home directory. This is the default location for Oracle products. If you have installed into a location other than %ORACLE\_HOME%, replace all references to %ORACLE\_HOME% with the drive and path specification you have used.

### **Storage Measurements**

Storage measurements use the following abbreviations:

- K, for kilobyte which equals 1024 bytes
- M, for megabyte which equals 1 048 576 bytes
- G, for gigabyte which equals 1 073 741 824 bytes

# Accessing Installed Documentation

## **Documentation for Oracle Procedural Gateway for APPC for Windows**

Documentation for this product includes this guide and the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* and the *Oracle Procedural Gateway for APPC Messages Guide for UNIX and Microsoft Windows*.

To access the documentation in HTML and PDF formats, use a browser to open the top level of the Gateway Documentation library on the installation media. This level contains links to product and Windows-specific documentation.

## **Oracle Product Documentation**

Oracle product documentation is on the Oracle Database Generic Documentation library included in the installation media. Instructions for accessing and installing the documents on the installation media are found in the README file on the top level directory of the installation media.

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# Introduction to Oracle Procedural Gateway for APPC

The Oracle Procedural Gateway for APPC (the "gateway") enables users to initiate transaction program execution on remote online transaction processors (OLTPs.) The Oracle Procedural Gateway for APPC can establish connection with OLTP using the SNA communication protocol. The gateway can also use TCP/IP for IMS Connect to establish communication with the OLTP through TCP/IP. The gateway provides Oracle applications with seamless access to IBM mainframe data and services through Remote Procedural Call (RPC) processing. The gateway can access any application capable of using the CPI-C API either directly or through a TP monitor such as CICS.

This chapter discusses the architecture, uses, and features of the gateway. It contains the following sections:

- [Overview of the Gateway](#)
- [Features of the Gateway](#)
- [Terms](#)
- [Architecture of the Gateway](#)
- [Implementation of the Gateway](#)
- [Communication with the Gateway](#)
- [Remote Procedural Call Functions](#)
- [Transaction Types for Gateway Using SNA](#)
- [Transaction Types for Gateway Using TCP/IP](#)

## 1.1 Overview of the Gateway

The Oracle Procedural Gateway for APPC extends the Remote Procedural Call (RPC) facilities available with the Oracle server. The gateway enables any client application to use PL/SQL to request execution of a remote transaction program (RTP) residing on a host. The gateway provides RPC processing to systems using the SNA APPC (Advanced Program-to-Program Communication) protocol and to systems using TCP/IP for IMS Connect protocol. This architecture allows efficient access to data and transactions available on the IBM mainframe and IMS, respectively.

The gateway requires no Oracle software on the remote host system. Thus, the gateway uses existing transactions with little or no programming effort on the remote host.

### **For gateways using SNA:**

The use of a generic and standard protocol, APPC, allows the gateway to access a multitude of systems. The gateway can communicate with virtually any APPC-enabled system, including IBM Corporation's CICS on any platform, IBM Corporation's IMS and APPC/MVS, and Computer Associates' IDMS. These transaction monitors provide access to a broad range of systems, allowing the gateway to access many datastores, including VSAM, DB2 (static SQL), IMS, IDMS, ADABAS, and others.

The gateway can access any application capable of using the CPI-C API either directly or through a TP monitor such as CICS.

## 1.2 Features of the Gateway

The Oracle Procedural Gateway for APPC provides the following benefits:

- TCP/IP support for IMS Connect

This release of the gateway includes TCP/IP support for IMS Connect, giving users a choice of whether to use the SNA or TCP/IP communication protocol. IMS Connect is an IBM product which allows TCP/IP clients to trigger execution of IMS transactions. The gateway can use a TCP/IP communication protocol to access IMS Connect, which triggers execution of IMS transactions. If you choose to use TCP/IP, then there is no SNA involvement with this configuration. Related to this new feature of the gateway is:

  - The pg4tcpmap tool. This release of the gateway includes a new tool whose purpose is to map the information from your side profile name to TCP/IP and IMS Connect. For more information about the gateway mapping tool, refer to Chapter 6 of the Oracle Procedural Gateway for APPC *User's Guide*, and to [Chapter 10, "Gateway Configuration Using TCP/IP Communication Protocol"](#) in this guide.
- Fast interface

The gateway is optimized so that remote execution of a program is achieved with minimum network traffic. The interface to the gateway is an optimized PL/SQL stored procedure specification (called the TIP or transaction interface package) precompiled in the Oracle Integrating Server. Because there are no additional software layers on the remote host system, overhead occurs only when the program processes.
- Location transparency

Client applications need not be operating system-specific. For example, your application can call a program on a CICS Transaction Server for z/OS. If you move the program to a CICS region on pSeries, then you need not change the application.
- Application transparency

Users calling applications that execute a remote transaction program are unaware that a request is sent to a host.
- Flexible interface

You can use the gateway to interface with existing procedural logic or to integrate new procedural logic into an Oracle Integrating Server environment.
- Oracle server integration

The integration of the Oracle server with the gateway enables the gateway to benefit from existing and future Oracle features. For example, the gateway can be called from an Oracle stored procedure or database trigger.
- Transactional support

The gateway and the Oracle Integrating Server allow remote transfer updates and Oracle server updates to be performed in a coordinated fashion.
- Wide selection of tools

The gateway supports any tool or application that supports PL/SQL.

- PL/SQL code generator

The Oracle Procedural Gateway for APPC provides a powerful development environment, including:

- a data dictionary to store information relevant to the remote transaction
- a tool to generate the PL/SQL Transaction Interface Package, or TIP
- a report utility to view the information stored in the gateway dictionary
- a complete set of tracing and debugging facilities
- a wide set of samples to demonstrate the use of the product against datastores such as DB2, IMS, IDMS, CICS, and ADABAS

- Site autonomy and security

The gateway provides site autonomy, allowing you to do such things as authenticate users. It also provides role-based security compatible with any security package running on the mainframe computer.

- Automatic conversion

Through the TIP, the following conversions are performed:

- ASCII to and from EBCDIC
- remote transaction program datatypes to and from PL/SQL datatypes
- national language support for many languages



## 1.3 Terms

The following terms and definitions are used throughout this guide. Refer to [Appendix C, "Gateway Terminology"](#) for a more elaborate list of terms and definitions pertaining to the gateway, its components and functions.

### Oracle Integrating Server

This is any Oracle server instance that communicates with the gateway for purposes of performing remote procedural calls to execute remote transaction programs (RTP). The Oracle Integrating Server can be on the same system as the gateway or on a different system. If it is on a different system, then Oracle Net is required on both systems. Refer to [Figure 1–2, "Gateway Architecture"](#) for a view of the gateway architecture.

### OLTP

Online Transaction Processor (OLTP) is any of a number of online transaction processors available from other vendors, including CICS Transaction Server for z/OS, IMS/TM, z/OS and IDMS-DC.

### PGAU

Procedural Gateway Administration Utility (PGAU) is the tool that is used to define and generate PL/SQL transaction interface packages (TIPs.) Refer to Chapter 2, "Procedural Gateway Administration Utility" in the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* for more information about PGAU.

### PG DD

Procedural Gateway Data Dictionary (PG DD) is a repository of remote host transaction (RHT) definitions and data definitions. PGAU accesses definitions in the Data Dictionary (PG DD) when generating TIPs. The PG DD has datatype dependencies because it supports the PGAU and is not intended to be directly accessed by the customer. Refer to Appendix A, "Procedural Gateway for APPC Data Dictionary" in the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* for a list of PG DD tables.

### RPC

Remote Procedural Call (RPC) is a programming call that executes program logic on one system in response to a request from another system. Refer to ["Gateway Term Definitions"](#) on page C-1 for more information, and refer to Appendix C, "Gateway RPC Interface" in the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* as well.

### RTP

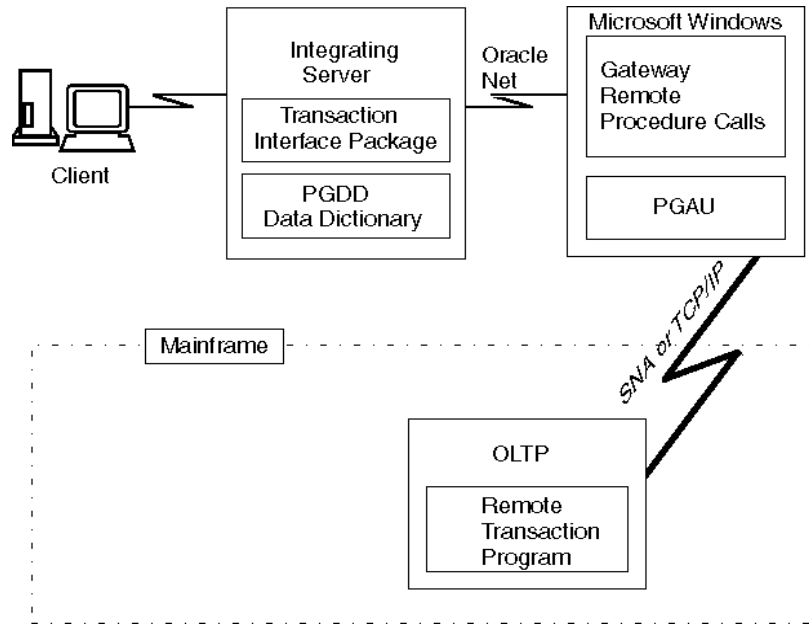
A remote transaction program (RTP) is a customer-written transaction, running under the control of an OLTP, which the user invokes remotely using a PL/SQL procedure. To execute a RTP through the gateway, you must use RPC to execute a PL/SQL program to call the gateway functions.

### TIP

A Transaction Interface Package (TIP) is an Oracle PL/SQL package that exists between your application and the remote transaction program. It is a set of PL/SQL stored procedures that invoke the remote transaction program through the gateway. TIPs perform the conversion and reformatting of remote host data using PL/SQL and UTL\_RAW or UTL\_PG functions.

Figure 1-1, "Relationship of Gateway and Oracle Integrating Server on Windows" illustrates where the terminology discussed in the preceding sections apply within the gateway's architecture.

**Figure 1-1 Relationship of Gateway and Oracle Integrating Server on Windows**



## 1.4 Architecture of the Gateway

The architecture of Oracle Procedural Gateway for APPC consists of several components:

1. Oracle Integrating Server

The Oracle Integrating Server is usually installed on the same system as Oracle Procedural Gateway for APPC.

If you install the Oracle Integrating Server on a system other than the system on which the gateway is installed, then you must install Oracle Net with the Oracle Integrating Server and with the gateway. The Oracle Integrating Server must be capable of connecting to the gateway through any supported Oracle Net protocol.

Refer to "[Product Set](#)" on page 2-2 for a list of Oracle Net protocols currently supported by the gateway and tools.

The Oracle Integrating Server can also be used for nongateway applications.

2. The gateway

Oracle Procedural Gateway for APPC must be installed on a server that can run the required version of the operating system.

3. An OLTP

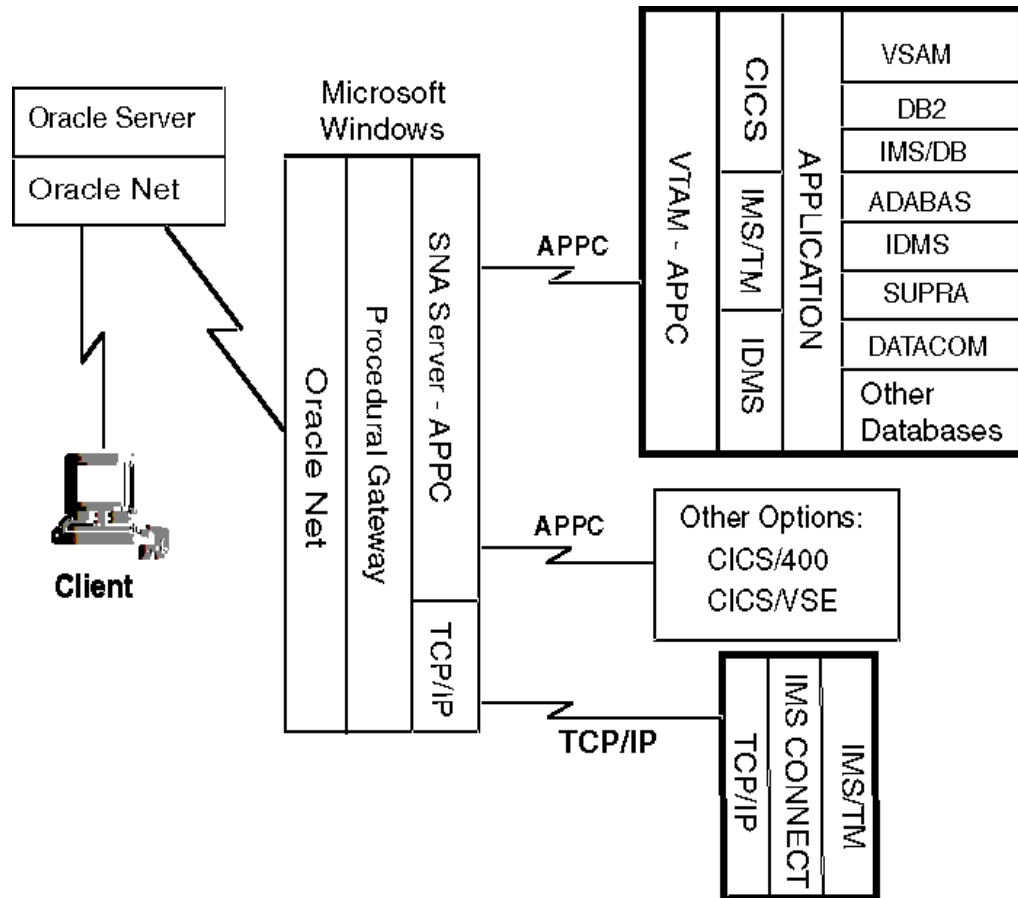
The OLTP must be accessible from the gateway using the SNA or TCP/IP communication protocol. Multiple Oracle Integrating Servers can access the same gateway. A single system gateway installation can be configured to access more than one OLTP.

- **For a gateway using TCP/IP support for IMS Connect:** The only OLTP that is supported through TCP/IP is IMS through IMS Connect.

The OLTP must be accessible to the system using the TCP/IP protocol. Multiple Oracle Integrating Servers can access the same gateway. A single-system gateway installation can be configured to access more than one OLTP. Multiple IMS can be accessed from an IMS Connect. If you have a number of IMS Connect systems available, then any of these may be connected to one or more IMS systems.

Figure 1-2 illustrates the architecture of Oracle Procedural Gateway for APPC using either SNA or TCP/IP, as described in the preceding section.

Figure 1-2 Gateway Architecture



## 1.5 Implementation of the Gateway

The basic structure of the gateway is the same whether your communications protocol is SNA or TCP/IP support for IMS Connect. The gateway has some of the same components as an Oracle database instance on Microsoft Windows. It has the following components:

- a home directory, similar to the one associated with an Oracle instance's *ORACLE\_HOME* environment variable;
- a system identifier, identified as *sid* or *ORACLE\_SID*;
- an initialization parameter file, similar to the Oracle Integrating Server's *initsid.ora* file.

The gateway does not have:

- control, redo log, or database files;
- the full set of subdirectories and ancillary files associated with an installed Oracle server.

Because the gateway has no background processes and does not need a management utility such as Oracle Enterprise Manager, you do not need to start the gateway product. Each Oracle Integrating Server user session that accesses a particular gateway creates an independent process on Windows, which, in turn, runs the gateway server and executes either the SNA or TCP/IP functions to communicate with an OLTP.

## 1.6 Communication with the Gateway

All of the communication between the user or client program and the gateway is handled through a TIP which executes on an Oracle Integrating Server. The TIP is a standard PL/SQL package that provides the following functions:

- declares the PL/SQL variables that can be exchanged with a RTP;
- calls the gateway packages that handle the communications for starting the conversation, exchanging data, and terminating the conversation;
- handles all datatype conversions between datatypePL/SQL datatypes and the target program datatypes.

The PGAU, provided with the gateway, automatically generates the TIP specification.

The gateway is identified to the Oracle Integrating Server using a database link. The database link is the same construct used to identify other Oracle server databases. The functions in the gateway are referenced in PL/SQL as:

*function\_name@dblink\_name*

## 1.7 Remote Procedural Call Functions

The Oracle Procedural Gateway for APPC provides a set of functions that are invoked by the client through remote procedural call (RPC). These functions direct the gateway to initiate, transfer data with, and terminate RTPs running under an OLTP on another system.

[Table 1–1](#) lists the RPC functions and the correlating commands that are invoked in the gateway and remote host.

**Table 1–1 RPC Functions and Commands in the Gateway and Remote Host**

Applications	Oracle TIP	Gateway	Remote Host
call tip_init	tip_init call pgainit@gateway	PGAINIT	Initiate program
call tip_main	tip_main call pgaxfer@gateway	PGAXFER	Exchange data
call tip_term	tip_term call pgaterm@gateway	PGATERM	Terminate program

### 1.7.1 Description of RPC Functions

The following sections describe how the RPC functions perform on gateways using SNA or TCP/IP communication protocols.

#### 1.7.1.1 Remote Transaction Initiation

The TIP initiates a connection to the remote host system, using one of the gateway functions, PGAINIT.

**When the communication protocol is SNA:** PGAINIT provides, as input, the required SNA parameters to start a conversation with the target transaction program. These parameters are sent across the SNA network, which returns a conversation identifier to PGAINIT. Any future calls to the target program use the conversation identifier as an INPUT parameter.

**When the communication protocol is TCP/IP:** PGAINIT provides, as input, the required TCP/IP parameters. Use the pg4tcpmap tool to map the parameters. These parameters are sent across the TCP/IP network to start the conversation with the target transaction program, the TCP/IP network returns a socket file descriptor to PGAINIT. Future calls to the target program made by PGAXFER and PGATERM use the socket file descriptor as an input parameter.

Refer to [Appendix B, "Gateway Initialization Parameters for TCP/IP Communication Protocol"](#) in this guide, and to Chapter 6 in the Oracle Procedural Gateway for APPC *User's Guide*, for more information about the function and use of the pg4tcpmap tool.

#### 1.7.1.2 Data Exchange

After the conversation is established, a procedural gateway function called PGAXFER can exchange data in the form of input and output variables. PGAXFER sends and receives buffers to and from the target transaction program. The gateway sees a buffer as only a RAW stream of bytes. The TIP that is residing in the Oracle Integrating Server is responsible for converting the application's PL/SQL datatypes to RAW before sending the buffer to the gateway. It is also responsible for converting RAW to the PL/SQL datatypes before returning the results to the application.

### 1.7.1.3 Remote Transaction Termination

When communication with the remote program is complete, the gateway function PGATERM terminates the conversation between the gateway and the remote host.

**When the communication protocol is SNA;** PGATERM uses the conversation identifier as an INPUT parameter to request conversation termination.

**When the communication protocol is TCP/IP;** PGATERM uses the socket file descriptor for TCP/IP as an INPUT parameter to request conversation termination.

## 1.8 Transaction Types for Gateway Using SNA

The Oracle Procedural Gateway for APPC supports three types of transactions that read data from and write data to remote host systems:

- **one-shot**

In a one-shot transaction, the application initializes the connection, exchanges data, and terminates the connection, all in a single call.

- **persistent**

In a persistent transaction, multiple calls to exchange data with the remote transaction can be executed before terminating the conversation.

- **multiconversational**

In a multiconversation transaction, the procedural gateway server can be used to exchange multiple records in one call to the RTP.

Refer to "Remote Host Transaction Types" in Chapter 4, "Client Application Development" of the *Oracle Procedural Gateway for APPC User's Guide* for more information about transaction types.

The following list demonstrates the power of the Oracle Procedural Gateway for APPC:

- You can initiate a CICS transaction on the mainframe to retrieve data from a VSAM file for a PC application.
- You can modify and monitor the operation of a remote process control computer.
- You can initiate an IMS/TM transaction that executes static SQL in DB2.
- You can initiate a CICS transaction that returns a large number of records in a single call.

## 1.9 Transaction Types for Gateway Using TCP/IP

The Oracle Procedural Gateway for APPC using TCP/IP for IMS Connect supports three types of transaction socket connections:

- **transaction socket**

The socket connection lasts across a single transaction.

- **persistent socket**

The socket connection lasts across multiple transactions.

- **nonpersistent socket**

The socket connection lasts across a single exchange consisting of one input and one output.

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**Note:** Do not use the nonpersistent socket type if you plan on implementing conversational transactions because multiple connects and disconnects will occur.

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Refer to the section about `pg4tcpmap` commands in Chapter 6 of the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* and to [Chapter 10, "Gateway Configuration Using TCP/IP Communication Protocol"](#) in this guide for more information about how to enter these parameters.

You can initiate an IMS/TM transaction that executes static SQL in DB2, this illustrates the power of the Oracle Procedural Gateway for APPC feature supporting TCP/IP for IMS Connect.



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## Release Information

This chapter provides information about this release of the Oracle Procedural Gateway for APPC. It contains the following sections:

- [Product Set](#)
- [Changes and Enhancements, Release 10.2.0.1.0](#)
- [Known Restrictions](#)

## 2.1 Product Set

The distribution CD for this release of the Oracle Procedural Gateway for APPC includes the following production components:

- Oracle Procedural Gateway for APPC Release 10.2.0.1.0
- Oracle Net Release 10.2.0.1.0

## 2.2 Changes and Enhancements, Release 10.2.0.1.0

The following sections detail the changes and enhancements in this release of the Oracle Procedural Gateway for APPC.

### 2.2.1 Enhancement

There are no enhancements for this release.

### 2.2.2 Changes

The following sections provide information on changes to this release of the Oracle Procedural Gateway for APPC:

#### 2.2.2.1 Bug 3557168: Init.ora Not Found

If the gateway cannot find the initsid.ora file, then an error should be returned.

#### 2.2.2.2 PG4PWD Replacement Tool Place Holder

For this release, a tool called tg4pwd has replaced pg4pwd. Refer [Section 11.6, "Passwords in the Gateway Initialization File"](#) for more information.

#### 2.2.2.3 Bugs Fixed in Release 10.2.0.1.0

No bugs have been reported in Release 10.2.0.1.0 of the gateway.

## 2.3 Known Restrictions

The following sections list the known restrictions for the Oracle Procedural Gateway for APPC and PGAU.

### 2.3.1 Known Restrictions for the Gateway

The following restrictions are known to exist in this release of the Oracle Procedural Gateway for APPC.

#### **Multibyte Character Sets Are Not Supported for Numeric Data and Clauses**

The Oracle Procedural Gateway for APPC has supported multibyte character set data for COBOL PIC G datatypes since version 3.4. However, the non-numeric character data (such as \$, (,), +, -,) that is allowed in DISPLAY datatypes and PIC 9 edit masks must still be specified in EBCDIC. The non-numeric character data is not subject to MBCS translation.

#### **CICS Transactions Do Not Allow PF Key Emulation**

When performing a CICS transaction using the Oracle Procedural Gateway for APPC, you cannot emulate CICS PF keys.

**APPC PIP Data Is Not Supported**

You cannot define and transmit APPC PIP data in this release of the Oracle Procedural Gateway for APPC.

**Floating Point Data Type Conversion Is Not Supported**

Conversion of the floating point datatype is not supported by the Oracle Procedural Gateway for APPC.

**Transaction Programs Are Responsible for All Data Compression and Decompression**

The Oracle Procedural Gateway for APPC does not provide exits for compression and decompression facilities. All data exchanged between the gateway and the transaction must be in uncompressed format.

**2.3.2 Known Restrictions for PGAU****Restrictions with PGAU COBOL COPY REPLACE**

When COBOL input to the PGAU DEFINE DATA statement contains a COPY REPLACE clause, only the first replacement is made.



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## System Requirements

This chapter describes the system requirements of the gateway. It contains the following sections:

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

## 3.1 Hardware Requirements

The hardware requirements for this release of the gateway on Microsoft Windows are described in the following sections.

### 3.1.1 Processor Requirements

Refer to the *Oracle Database Installation Guide for Microsoft Windows (32-Bit) 10g Release 2 (10.2)* for Microsoft Windows and to the certification matrix on *OracleMetaLink* for the most up-to-date list of certified hardware platforms and operating system version requirements to operate the gateway for your system. The *OracleMetaLink* Web site can be found at:

<http://metalink.oracle.com>

The Oracle Procedural Gateway for APPC requires an Intel or 100% compatible personal computer based on a Pentium processor that can run Microsoft Windows 2000 and higher.

### 3.1.2 Memory Requirements

For most installations, Oracle recommends a minimum of 256 MB of real memory for the system running the Oracle Procedural Gateway for APPC.

Each concurrent use of the gateway requires a minimum of 10 MB.

The following factors affect the virtual memory requirements of the gateway server process:

- number of concurrent gateway connections opened by each user;
- number of data items being transferred between the gateway and the RTP;
- additional factors such as configured network buffer size;
- the Oracle Net protocol adapters that were included during the gateway installation.

### 3.1.3 Network Attachment Requirements

The gateway requires any network attachment supported by either the SNA Server for your platform or the TCP/IP Networking Facility for TCP/IP communication.

However, if you are using solely the new TCP/IP support for IMS Connect feature, you will not need an SNA package. The Windows operating system comes with TCP/IP installed, you will need to configure it.

### 3.1.4 Disk Space Requirements

The gateway's disk space requirements is a minimum of 350 M.

## 3.2 Software Requirements

The system software configuration described in these requirements is supported by Oracle, provided that the underlying system software products are supported by their respective vendors. Verify the latest support status with your system software vendors.

### 3.2.1 Operating System Requirements

Refer to the *Oracle Database Installation Guide for Microsoft Windows (32-Bit)* and to the certification matrix on the *OracleMetaLink* for the most up-to-date list of certified operating system version requirements to operate the gateway for your Windows Intel system. The *OracleMetaLink* Web site can be found at:

<http://metalink.oracle.com>

### 3.2.2 Communication Protocol Requirements

A Microsoft Host Integration Server 2000 is required, or IBM Communication Server V6.1.1 (or higher) for Windows. In this document, either of these communications servers will be referred to generically as SNA Server.

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**Note:** If you choose to use TCP/IP support for IMS Connect as your communications protocol, then you will not need to use an SNA Server. Your operating system comes with a TCP/IP protocol automatically installed. If you choose to use the TCP/IP protocol, you will need to configure it to work properly with the gateway then instructions for doing so are located in [Chapter 10, "Gateway Configuration Using TCP/IP Communication Protocol"](#).

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### 3.2.3 Oracle Server Requirements

The Microsoft Windows platform requires that the Oracle server which is to act as the Oracle Integrating Server be up to date with the latest patch set for supported Oracle database releases.

### 3.2.4 Oracle Networking Product Requirements

Oracle Net is automatically installed on the system where the Oracle Database 10g Server is installed and on the system where the gateway is installed. Refer to [Chapter 5, "Configuring Your Oracle Network"](#) in this guide for configuration information. Additionally, you may refer to the *Oracle Database Net Services Administrator's Guide*.

### 3.2.5 IBM Mainframe Requirements

In addition to the other software requirements of the gateway and your particular platform, the following list outlines other requirements necessary on the IBM mainframe:

#### **OLTP for SNA**

The OLTP must support mapped APPC conversations. If the OLTP transaction programs to be executed through the gateway perform database updates, then the APPC verbs CONFIRM, CONFIRMED, and SEND\_ERR must be supported by the OLTP. These verbs implement APPC sync level 1.

All resources controlled by an OLTP that can be updated by transaction programs invoked through the gateway must be defined as recoverable resources to the OLTP and host system if COMMIT/ROLLBACK capability is required for those resources. For example, a VSAM file updated by a CICS transaction must be defined to CICS as a recoverable file for COMMIT/ROLLBACK to control the updates.

The gateway is compatible with all supported releases of SNA-enabled products such as CICS, IMS/TM, IDMS, and z/OS.

**Important:** For a list of known restrictions, read the "[Known Restrictions](#)" section on page 2-2 before proceeding with installation of the gateway.

### **OLTP for TCP/IP**

IMS/TM: Release 7.1 or later is required, as well as any APARs (patches) listed in the *IBM IMS Connect Guide and Reference*.

IMS Connect: Release 1.2 or higher is required.

## **3.3 Documentation Requirements**

Oracle recommends that you become familiar with the concepts and components of all products related to your gateway and that you read the following documentation on Oracle products other than your gateway:

- *Oracle Database PL/SQL User's Guide and Reference*
- *Oracle Database Installation Guide for Microsoft Windows (32-Bit)*
- *Oracle Database Concepts*
- *Oracle Database Error Messages*
- *Oracle Database Net Services Administrator's Guide*
- *Oracle Call Interface Programmer's Guide*

In addition to the Oracle documentation, ensure that you have required documentation for your platform, for your operating system, and for your communications packages.

The following IBM documentation may be useful:

- *IMS Connect Guide and Reference*

The title of the IBM publication was accurate at the time of the publication of this guide. Titles and structure of these documents are subject to change. For other operating system, SNA communication package, and TCP/IP package references, refer to the appropriate vendor documentation for your system.



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## Installing the Gateway

The following topics in this chapter describe how to install and configure the Oracle Procedural Gateway for APPC:

- [Before You Begin](#)
- [Planning to Upgrade or Migrate the Gateway](#)
- [Performing Preinstallation Procedures](#)
- [Installing the Gateway Software](#)
- [Installation Steps](#)
- [Removing Your Oracle Procedural Gateway for APPC](#)

## 4.1 Before You Begin

Configuring an online transaction processor to allow access by the gateway requires actions on the Online Transaction Processor (OLTP) and on certain components of the host operating system. Although no Oracle software is installed on the host system, access to, and some knowledge of, the host system and the OLTP are required. Although this chapter includes some information about host system and OLTP installation steps, you must ensure that you have the applicable OLTP and host system documentation available.

Some of the configuration actions on the OLTP might require you to restart the OLTP. In preparation for this, have your host system programmer or DBA review the instructions for your OLTP to allow for any necessary preparations.

To install and configure the gateway with a single Oracle Integrating Server and a single OLTP, perform the procedures described in this chapter.

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**Note:** If your gateway uses the SNA communication protocol, then you will follow the instructions for installation and configuration in this chapter, in [Chapter 5, "Configuring Your Oracle Network"](#) and in [Chapter 9, "Gateway Configuration Using SNA Communication Protocol"](#).

If your gateway uses the TCP/IP communication protocol, then you will follow the instructions for installation and configuration in this chapter, in [Chapter 5, "Configuring Your Oracle Network"](#) and in [Chapter 10, "Gateway Configuration Using TCP/IP Communication Protocol"](#).

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## 4.2 Planning to Upgrade or Migrate the Gateway

If you have an earlier version of the Oracle Procedural Gateway for APPC installed on your system, then you may be upgrading or migrating to the current release. A gateway upgrade represents a minor software upgrade within a release, (for example, moving from Release 9.0 to Release 9.2.0) a gateway migration represents a significant change from one version number to another, (for example, migrating from Release 9.0 to 10.2).

This section is only for customers who have a previous release of Oracle Procedural Gateway for APPC. If you have a previous gateway installation, then you will need to carry out specific tasks before you can install Release 10.2.0.1.0 of the Oracle Procedural Gateway for APPC.

- After reading this section, you will need to read [Chapter 12, "Migration from Existing Gateways"](#) to determine the specific actions you must take to prepare for upgrade or migration of your gateway. If you are migrating to Oracle Procedural Gateway for APPC Release 10.2.0.1.0 from version 4.01 or earlier, then you will find specific material related to migration of the gateway in [Chapter 12, "Migration from Existing Gateways"](#).

You may find it helpful to refer to [Appendix D, "Summary of Changes in Previous Versions"](#) for information about changes or corrected problems from earlier releases of the gateway.

If you are installing for the first time, then begin with ["Performing Preinstallation Procedures"](#) on page 4-4.

## 4.2.1 Performing Pre-Upgrade Procedures

Perform the following steps to prepare for upgrading the Oracle Procedural Gateway for APPC to current versions:

1. Make backups of altered PGA shipped files.
2. Remove or rename any old gateway directories.

## 4.2.2 Upgrade and Migration Considerations

Upgrade considerations are as follows:

- PGAU control files from Gateway Release 8 or 9 are upward-compatible, and you do not need to change them.
- After upgrade, the PG DD contains all of its earlier entries without modification. New PGAU control information has been added along with some columns to support new features, but no customer entries are altered by the upgrade.
- All TIPs from Oracle Procedural Gateway for APPC Release 4.0.1 or earlier must be recompiled, due to changes in the following:
  - PL/SQL compatibility
  - gateway server RPC interface
  - UTL\_PG interface
- **TCP/IP only:** If you have existing TIPs that were generated previously on a gateway using the SNA communication protocol and you want to use the new TCP/IP feature, then the TIPs will have to be regenerated by PGAU with mandatory NLS\_LANGUAGE and Side Profile Settings. Specify the appropriate ASCII character set in the DEFINE TRANSACTION command.

This is due to the fact that the gateway assumes that the appropriate user exit in IMS Connect is being used, which would translate between the appropriate ASCII and EBCDIC character sets.

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**Caution:** An upgraded PG Data Dictionary (PG DD) cannot be accessed by an earlier release of PGAU.

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## 4.2.3 Restoration

If you want to restore a previous release of gateway, then you must restore the following components to their previous versions:

- PGAU
- PG DD
- gateway server

## 4.3 Performing Preinstallation Procedures

Before you install the gateway, perform the following preinstallation procedures:

- Ensure that your system meets all the hardware and software requirements specified in [Chapter 3, "System Requirements"](#).
- Ensure that your security requirements are met.

Refer to [Chapter 3, "System Requirements"](#) for more information about the security requirements for connections and data access on your OLTP.

- Fill out the worksheet identifying unique parameter names needed to configure your system and your chosen communication protocol (either SNA or TCP/IP), which is located in [Chapter E, "Configuration Worksheet"](#).
- Decide on an SID (system identifier) for your gateway. This SID is used in [Section 9.7, "Configuring the Gateway"](#) on page 9-10.

The SID must be unique and must not be used by any other gateway or Oracle Integrating Server on the system.

- **SNA only:** Your SNA package must be installed and configured before you can proceed with installation of the gateway. Ensure that your system can communicate with the OLTP using the SNA Server required for your platform. Refer to [Chapter 6, "Configuring the SNA Communication Package on Windows"](#) for more information about setting up and configuring SNA for Windows.
- **TCP/IP only:** Your TCP/IP package must be installed and configured before you can proceed with installation of the gateway. Refer to [Chapter 7, "Configuring the TCP/IP Communications Package for IMS Connect"](#) for more information about setting up and configuring TCP/IP for Windows.

Ensure that your system can communicate with the OLTP using the TCP/IP communication package for your platform.

If you need general information about installing Oracle products and using the Oracle Universal Installer, then refer to the *Oracle Database Installation Guide for Microsoft Windows (32-Bit)*

### 4.3.1 Gateway Installation Methods

You can install the gateway in either of the following ways:

1. On the same system as the existing Oracle Integrating Server but in a different directory.  
All tasks for this type of installation or upgrade are discussed in this section.
2. On a system different from a local Oracle Integrating Server.
3. On the same system as the Oracle Integrating Server, and in the same Oracle home directory. Note that in this case, the Oracle Integrating Server and the gateway must be at the same release level.

## 4.4 Installing the Gateway Software

For general information about installing Oracle products and how to use the Oracle Universal Installer, refer to the *Oracle Database Installation Guide for Microsoft Windows (32-Bit)* and perform all necessary tasks there first.

If your server release is different than your gateway release, then *do not* install the gateway in the same Oracle home directory as the Oracle Integrating Server. This is

required to isolate the gateway from the Oracle Integrating Server upgrades that might cause incompatibilities if the gateway executables were relinked with later versions of the Oracle server libraries.

## 4.5 Installation Steps

If you wish to install the gateway in the same Oracle home as the Oracle Integrating Server, then the release number of both products must be the same.

### 4.5.1 Step 1: Log On to Windows System

Logon to your Windows system as a member of the Administrators group. If you are not currently a DBA user, then contact your system administrator to create a DBA login user ID. Refer to the *Oracle Database Installation Guide for Microsoft Windows (32-Bit)* for login information.

### 4.5.2 Step 2: Ensure Minimum Amount of Disk Space

If you are installing the gateway for the first time, then ensure that there is enough space on the disk where the gateway will reside, as specified in "[Disk Space Requirements](#)" on page 3-2.

### 4.5.3 Step 3: Stop All Oracle Services

Before beginning the gateway installation process, you must stop all Oracle services that are currently running. Follow these steps:

1. Click **Start**, then **Settings**, then **Control Panel**.
2. Select **Services**. A list of all Windows services appears.
3. Select an Oracle service (those services begin with Oracle).
4. Click **Stop**.
5. Continue to select and stop Oracle services until all active Oracle services are stopped.

### 4.5.4 Step 4: Insert the Gateway Product Installation Media

Verify that the drive is assigned to the logical drive you selected and that you can access files on the installation media.

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**Note:** The installation steps that follow assume that the installation media location is mapped to the D: drive.

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The installation media package contains the Oracle Procedural Gateway for APPC and the Oracle Universal Installer.

### 4.5.5 Step 5: Start the Oracle Universal Installer

To start the Oracle Universal Installer, run `setup.exe`:

1. From the Start Menu, select **Run**.
2. Enter the path of the executable file name. For example:

```
D:\Disk1\setup.exe
```

## 4.5.6 Step 6: Step Through the Oracle Universal Installer

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**Caution:** Oracle Universal Installer automatically installs the Oracle-supplied version of the Java Runtime Environment (JRE). This version is required to run the Oracle Universal Installer and several Oracle assistants. Do not modify the JRE except by using a patch provided by Oracle Support Services. The Oracle Universal Installer also installs JDK.

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Oracle Universal Installer is a menu-driven utility that guides you through installing the gateway by prompting you with action items. The action items and the sequence in which they appear depend on your platform.

The following section describes how to use the Oracle Universal Installer to install the gateway on your platform.

### 4.5.6.1 Oracle Universal Installer on Windows Platforms

Use [Table 4–1](#) as a guide to step through the Oracle Universal Installer. At each prompt from the Oracle Universal Installer, perform the actions described in the Response column of the table to install the gateway on your Windows platform.

**Table 4–1** *The Oracle Universal Installer: Steps for Installing the Gateway*

Prompt	Response
1. Oracle Universal Installer: Welcome	Click <b>Next</b>
2. Oracle Universal Installer: Specify Home Details	a. Specify the name of the installation. Specify the full path where you want to install the product Click <b>Next</b>
3. Oracle Universal Installer: Available Product Components	a. Deselect the checked products b. Select <b>Oracle Transparent Gateway 10.2.0.1.0</b> , open up this row c. Select <b>Oracle Procedural Gateway for APPC 10.2.0.1.0</b> . (Note that you may also choose to select other products to install besides the Oracle Procedural Gateway for APPC). d. Click <b>Next</b>
4. Oracle Universal Installer: Network Software	Specify your network package and click <b>Next</b>
5. Oracle Universal Installer: Summary	Click <b>Install</b>
6. OracleNetConfiguration Assistance: Welcome	Click <b>Next</b>
7. Oracle Net Configuration Assistance: Listener Configuration, Listener Name	Specify the name of Listener you want to create and click <b>Next</b>
8. Oracle Net Configuration Assistance: Listener Configuration, Select Protocols	Select the protocols and click <b>Next</b>
9. Oracle Net Configuration Assistance: Listener Configuration, TCP/IP Protocol	Specify a port number and click <b>Next</b>

**Table 4–1 (Cont.) The Oracle Universal Installer: Steps for Installing the Gateway**

Prompt	Response
10. Oracle Net Configuration Assistance:Listener Configuration, More Listeners?	Click <b>No</b> and then click <b>Next</b>
11. Oracle Net Configuration Assistance: Listener Configuration Done	Click <b>Next</b>
12. Oracle net Configuration Assistance: Naming Methods Configuration	Click <b>No</b> and then click <b>Next</b>
13. Oracle Net Configuration Assistance:Done	Click <b>Yes</b>
14. Oracle Universal Installer: End of Installation	Click <b>Finish</b>
15. Exit	Click <b>Exit</b>

Your gateway is now installed.

When the Oracle Universal Installer confirms that the installation is complete, verify that the installation procedure was successful. To do this, read the contents of the installation log file, which is located in the C:\Program Files\Oracle\Inventory\logs directory.

The default file name is InstallActionsYYYY-MM-DD\_HH-mm-SS-AM/PM.log, where:

YYYY is year;  
MM is month  
DD is day  
HH is hour  
mm is minute  
SS is seconds  
AM/PM is daytime or evening

Each of these variables in the log file name represents the date and time the product was installed.

---



---

**Attention:** Print the contents of the %ORACLE\_HOME%\pg4appc\doc\README.doc file and read the entire document, it contains important information about the installation. After reading the README.doc file, proceed with the configuration of the gateway.

---



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## 4.6 Removing Your Oracle Procedural Gateway for APPC

If you decide to remove the gateway, then perform the following steps:

1. Drop the PG DD (packages and procedures) as follows:
  - a. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.
  - b. From SQL\*Plus, run the pgdddel.sql script in the %ORACLE\_HOME%\pg4appc\admin directory.
2. Insert the gateway product installation media.
3. Start the Oracle Universal Installer by running the Oracle Universal Installer executable, `setup.exe`:
  1. From the Start menu, select **Run**.
  2. Enter the path of the executable file name. For example:  
 D: \Disk1\setup.exe
4. Step through the Oracle Universal Installer. Use the prompts listed in [Table 4-2, "Steps to Remove the Gateway Using Oracle Universal Installer"](#) as a guide for removal, following the instructions in the Response column.

**Table 4-2 Steps to Remove the Gateway Using Oracle Universal Installer**

Prompt	Response
1. Oracle Universal Installer:	Click <b>Deinstall Products...</b>
2. Inventory	Check the specified <code>ORACLE_HOME</code> name and click <b>Remove</b> .
3. Confirmation	Click <b>Yes</b> .
4. Inventory	Click <b>Close</b> .
5. Oracle Universal Installer	Click <b>Cancel</b> .
6. Exit	Click <b>Yes</b> .

5. The gateway is now removed.

When the Oracle Universal Installer confirms that the gateway is removed, verify that the removal procedure was successful. To do this, read the contents of the deinstallation log file, which is located in the `C:\Program Files\Oracle\Inventory\logs` directory.

The default file name is `InstallActionsYYYY-MM-DD_HH-mm-SS-AM/PM.log`, where:

YYYY is year;  
 MM is month  
 DD is day  
 HH is hour  
 mm is minute  
 SS is seconds  
 AM/PM is daytime or evening

Each of these variables in the log file name represents the date and time the product was removed.



6. The only files that are removed are those that were copied to the %ORACLE\_HOME% directory during the gateway installation. You must remove any other related files manually, including deleting listener.ora and tnsnames.ora entries relating to the gateway, dropping database links and the PGAADMIN user ID and deleting the TIPS.



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# Configuring Your Oracle Network

Now that you have installed the gateway, this chapter will instruct you about how to configure the network.

It contains the following section:

- [Configuring the Oracle Network for the Gateway](#)

## 5.1 Configuring the Oracle Network for the Gateway

The instructions in this section will show you how to configure the network whether your gateway is using the SNA or TCP/IP communication protocol.

The gateway must be defined to the TNS listener, and a service name must be defined for accessing the gateway. To do this, perform the following steps:

1. Add an entry for the gateway to the listener.ora file:

- **If you are using SNA:**

```
(SID_DESC=
  (SID_NAME=PGA)
  (ORACLE_HOME= C:\oracle\pga\10.2)
  (PROGRAM=pg4asrv)
)
```

where: *C:\oracle\pga\10.2* is your gateway Oracle home, and *PGA* is the gateway SID name.

- **Or, if you are using TCP/IP:**

```
(SID_DESC=
  (SID_NAME=PGA)
  (ORACLE_HOME= C:\oracle\pga\10.2)
  (PROGRAM=pg4t4ic)
)
```

where: *C:\oracle\pga\10.2* is your gateway Oracle home, and *PGA* is the gateway SID name.

2. Add a service name for the gateway to the tnsnames.ora file on the system where your Oracle Integrating Server is located. The service name is specified in the USING parameter of the database link defined for accessing the gateway from the Oracle Integrating Server. For example, if you are using the IPC protocol adapter and your gateway *sid* is PGA, then add the following entry to tnsnames.ora:

```
pgaipc=
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = ipc) (KEY=key))
    (CONNECT_DATA = (SID=PGA))
    (HS=)
  )
```

In this example, *key* is the IPC key defined in the listener.ora file for the IPC protocol. You can use the IPC protocol only if the Oracle Integrating Server and the gateway are on the same system.

If you are using the TCP/IP protocol adapter and if your gateway *sid* is PGA, then add the following entry to tnsnames.ora:

```
pgatcp=
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL= TCP) (Host= gateway) (Port= port))
    (CONNECT_DATA = (SID=PGA))
    (HS=)
  )
```

In this example, *port* is the TCP port defined in the listener.ora file for the TCP protocol, and *gateway* is the TCP/IP host name of the system where the gateway is located.

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**Note:** Under the following circumstances:

- If your gateway and Oracle Integrating Server are not on the same system,
- or, if the gateway and the Oracle Integrating Server are on the same system but the Oracle Integrating Server Listener is different than the gateway listener,

then you must define the Oracle Integrating Server to PGAU by adding a service name to `tnsnames.ora` on the system where your gateway resides. For example:

```
ora_server =
  (DESCRIPTION=
    (ADDRESS =
      (PROTOCOL= TCP)
      (PORT= port)
      (HOST= ora_srv)
    )
    (CONNECT_DATA= (SID= ora_server))
  )
```

In this example,

- `port` is the TCP port defined in the Oracle Integrating Server `listener.ora` for the TCP protocol;
  - `ora_srv` is the TCP/IP host name of the system where the Oracle Integrating Server resides; and
  - `ora_server` is the SID of the Oracle Integrating Server.
- 
- 

Make sure to start your defined listeners. Refer to the *Oracle Net Services Administrator's Guide* for more information about configuring the network.

To see a sample `listener.ora` file refer to "[Sample listener.ora File for a Gateway Using SNA](#)" and "[Sample tnsnames.ora File for a Gateway Using SNA](#)" in [Appendix A](#) (if your communication protocol is SNA).

To see a sample `listener.ora` file refer to "[Sample listener.ora File for a Gateway Using TCP/IP](#)" and "[Sample tnsnames.ora File for a Gateway Using TCP/IP](#)" in [Appendix B](#) (if your communication protocol is TCP/IP).

### Proceed with Configuring Your Communication Package for the Gateway

- **If your communication protocol is SNA**, you must now configure the SNA Server profiles for APPC connections.

Proceed to [Chapter 6, "Configuring the SNA Communication Package on Windows"](#)

- **If your communication protocol is TCP/IP**, proceed to [Chapter 7, "Configuring the TCP/IP Communications Package for IMS Connect"](#).



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## Configuring the SNA Communication Package on Windows

The Oracle Procedural Gateway for APPC uses the SNA Advanced Program to Program Communication (APPC/LU6.2) protocol to communicate with an OLTP.

APPC support on Microsoft Windows can be provided by using either of the following tools:

- Microsoft Host Integration Server 2000, or
- IBM Communications Server v6.1.1 (or higher).

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**Note:** The term "SNA Server" is used in this document to generally refer to either the Microsoft Host Integration Server or the IBM Communications Server.

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Read this chapter to learn how to configure the SNA Server on a Windows system to run the Oracle Procedural Gateway for APPC, using either a Microsoft Host Integration Server or IBM Communications Server.

This chapter contains the following sections:

- [Using SNA Security Validation](#)
- [Processing Inbound Connections](#)
- [Configuring Your Microsoft Host Integration Server](#)
- [Creating SNA Server Definitions on Microsoft Host Integration Server](#)
- [Configuring an IBM Communications Server](#)
- [Creating IBM Communications Server Definitions for the Gateway](#)
- [Testing the Connection](#)
- [Resume Configuration of the Gateway](#)

## 6.1 Using SNA Security Validation

When a Remote Procedure Call (RPC) request to start a remote transaction program (RTP) is received by the gateway, the gateway attempts to start an APPC conversation with the OLTP. Before the conversation can begin, a session must start between the Windows Logical Unit (LU) and the OLTP LU.

SNA and its various access method implementations (including SNA Server and VTAM) provide security validation at session initiation time, allowing each LU to authenticate its partner. This validation is carried out entirely by network software before the gateway and OLTP application programs begin their conversation and process conversation-level security data. If session-level security is used, then correct password information must be established in the Windows SNA Server definitions and in similar parameter structures in the OLTP to be accessed. Refer to suitable communications software product documentation for detailed information about this subject.

## 6.2 Processing Inbound Connections

Many OLTPs provide options for manipulating the security conduct of an inbound (client) APPC session request. Refer to suitable OLTP documentation for detailed information about this topic.

Note that for CICS, one security option is not supported by the gateway:

- `ATTACHSEC=PERSISTENT`, specified on the `CICS CONNECTION` definition, requires capability that is not yet available in the gateway.

However, `ATTACHSEC=LOCAL`, `ATTACHSEC=IDENTIFY`, `ATTACHSEC=VERIFY`, and `ATTACHSEC=MIXIDPE` are fully supported by the gateway.

## 6.3 Configuring Your Microsoft Host Integration Server

The following sections discuss general information about the SNA Server and how to configure a Microsoft Host Integration Server.

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**Note:** If you are using the IBM Communication Server to configure your Windows system for the gateway, then proceed to [Section 6.5, "Configuring an IBM Communications Server"](#).

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### 6.3.1 Independent Versus Dependent LUs

Oracle recommends independent LUs for the Oracle Procedural Gateway for APPC because they support multiple parallel sessions or conversations. This means that multiple Oracle client applications can be active simultaneously with the same OLTP through the independent LU.

Dependent LUs support only a single active session. The CP (Control Point for the Node, which is SNA Server for Windows in this case) queues additional conversation requests from the gateway server behind an already active conversation. In other words, conversations are single-threaded for dependent LUs.

If a dependent LU is correctly defined, then no alterations to the Oracle Procedural Gateway for APPC configuration are needed, nor should any changes be needed to the host transaction or how the OLTP is started.



The operational impact of dependent LUs is that the first client application can initiate a conversation through the Procedural Gateway with the OLTP. While that transaction is active (which could be seconds to minutes to hours, depending on how the client application and transaction are designed), any other client application initiating a conversation with the same OLTP instance appears to hang as it waits behind the previous conversation.

If a production application really uses only a single conversation or transaction at any one time, then there should be no impact.

However, additional concurrent conversations or transactions might be required for testing or for other application development. Each requires that additional dependent LUs be defined on the remote host, plus additional SNA Server configuration entries, which define the additional dependent LUs on the Windows system. The TIP that initiates the conversation must specify the different Partner LU through a different Side Information Profile or by overriding the LU name. Refer to "PGAU DEFINE TRANSACTION" `SIDPROFILE` and `LUNAME` parameters in Chapter 2, "Procedural Gateway Administration Utility," in the *Oracle Procedural Gateway for APPC User's Guide*.

### 6.3.2 Location of Sample SNA Server Definitions

The `%ORACLE_HOME%\pg4appc\sna` subdirectory contains a sample set of gateway SNA Server definitions created with the `SNACFG` command. The `snacfg.ctl` file contains sample definitions for SNA Server.

Before building the SNA Server definitions, examine the `snacfg.ctl` file to determine the definitions needed, their contents, and their inter-relationships. The file format is text-oriented, and each field of each definition is clearly labelled. You can print a copy of the file to use while working with your definitions in a Microsoft Host Integration Server (formerly SNA Server Manager) session.

### 6.3.3 SNA Server Definition Types

Several types of SNA Server definitions are relevant to gateway APPC/LU6.2 operation. Each definition can be created and edited using a corresponding Microsoft Host Integration Server (formerly SNA Server Manager) menu.

The definitions relevant to the gateway are presented here in hierarchical order. Those definition types that are lowest in the hierarchy are discussed first. This matches the logical sequence in which to create the definitions.

Refer to the Windows SNA Server online documentation for a complete discussion of SNA Server definitions. This section provides an overview of SNA Server definitions in relation to the Oracle Procedural Gateway for APPC.

### 6.3.4 Methods of Creating SNA Server Definitions for the Gateway

SNA Server definitions can be created and modified in two ways:

- You can create the definitions using menus in the Microsoft Host Integration Server (formerly SNA Server Manager).

Using the Microsoft Host Integration Server is the recommended method for creating the definitions. You should be able to accept most of the defaults. The default values assigned to many of the fields in a new set of definitions are acceptable to the gateway.

Step through the tasks for creating SNA Server definitions in [Section 6.4, "Creating SNA Server Definitions on Microsoft Host Integration Server"](#) on page 6-5.

- Alternatively, you can install the definitions directly on your system using the `SNACFG` command.

For information on using the `SNACFG` command, refer to your vendor documentation.

If you use the `SNACFG` command method, then you must use Microsoft Host Integration Server (formerly SNA Server Manager) to review and modify the installed definitions. Because of configuration and naming differences, it is unlikely that they will work without modification.

Maintenance of SNA definitions is normally done by a user with Administrator authority. The following information is intended for the person creating SNA definitions for the gateway. You should have some knowledge of SNA before reading the following sections.

## 6.4 Creating SNA Server Definitions on Microsoft Host Integration Server

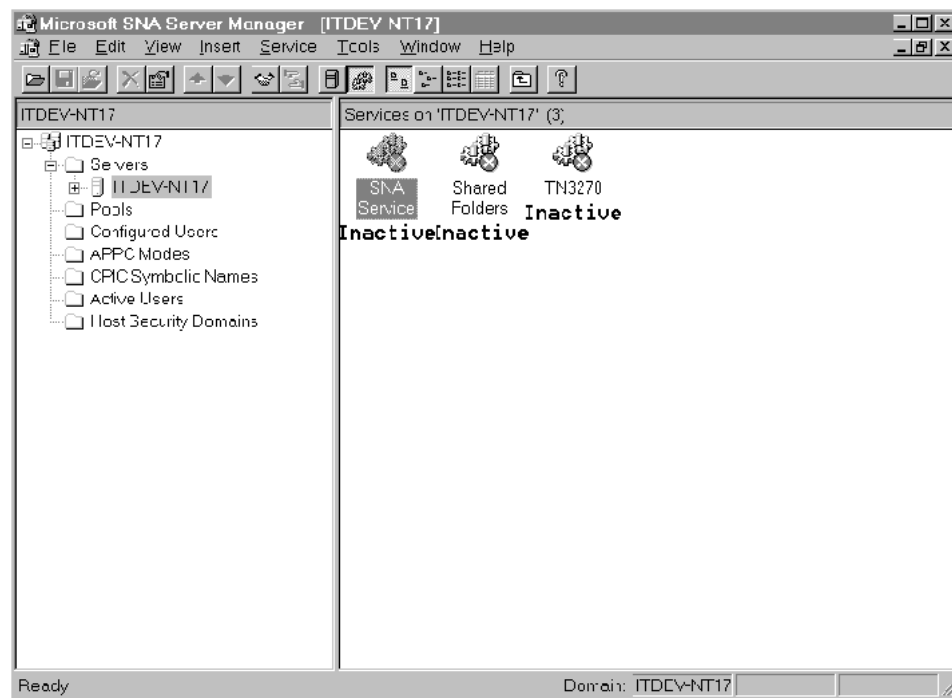
This section describes the process of creating your SNA definitions in the Microsoft Host Integration Server (formerly called the SNA Server Manager). All of the tasks described in this section are performed from within the Microsoft Host Integration Server. Note that the graphical interface you see on your screen when you use this tool will actually carry the name of the Microsoft Host Integration Server.

### 6.4.1 Server Selection

Select the appropriate folder to ensure that definitions created are for that server. When SNA Server Manager is started, a dialog box appears.

Select the Servers folder under your local system (in this example, ITDEV-NT17) and select the local SNA Server. From a list of services for that server, select the SNA Service.

**Figure 6–1 SNA Server Manager Window - Select SNA Service**

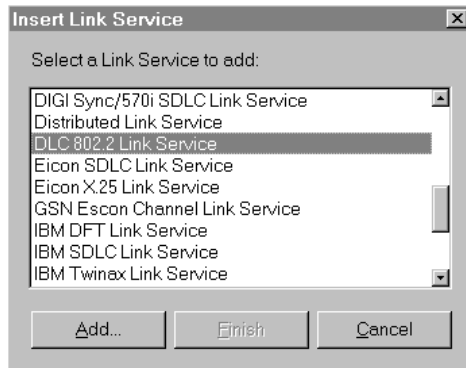


## 6.4.2 Link Service Definition

You must install and configure a link service for SNA Server to use the network adapter installed in your workstation, as follows:

1. From the Insert menu, select **Link Service**.
2. From the Insert Link Service dialog box, select the Link Service you want to use from the selection list and click **Add**. In this example, the DLC 802.2 Link Service is selected. (Refer to [Figure 6-2](#)).

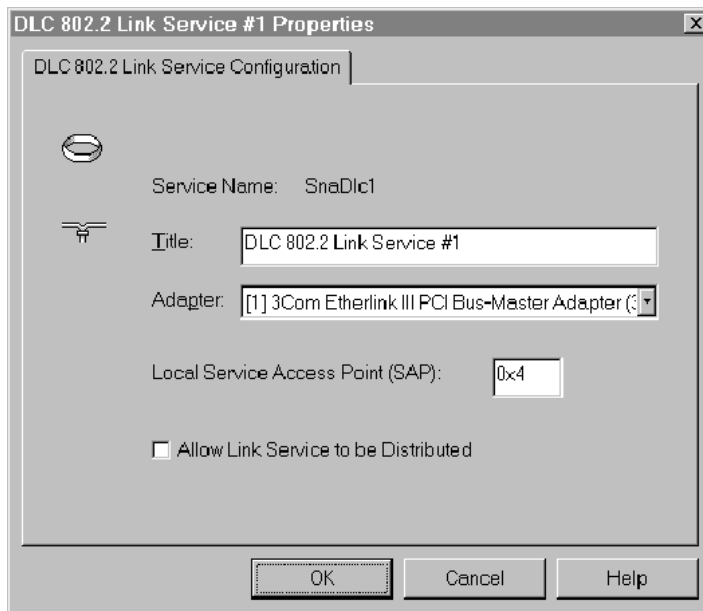
**Figure 6-2 Insert Link Service Dialog Box**



Now, the Link Service Properties dialog box is displayed. Note that the contents of this dialog box vary depending on which link service was selected. In this example, the DLC 802.2 Link Service Properties dialog box is used.

Select the suitable network adapter from the Adapter drop-down menu and click **OK**. In the Insert Link Service dialog box, click **Finish**. The system now updates your network bindings. (Refer to [Figure 6-3](#)).

**Figure 6-3 Link Service Properties Box**



### 6.4.3 Connection Definition

You must create a connection definition to define the devices which SNA Server uses to perform SNA communication. From the Insert menu, select **Connection**. The Connection Properties dialog box appears.

Select the General tab. Enter a connection name. This is the name used by SNA Server to name the connection. This example names the connection `TOKEN1`. From the Link Service drop-down menu, select a link service for the connection. All other settings can be left set to their default values. (Refer to [Figure 6-4](#)).

**Figure 6-4 Connection Properties Box - Enter Connection Name and Link Service**

The screenshot shows the 'Connection Properties' dialog box with the 'General' tab selected. The 'Name' field is filled with 'TOKEN1'. The 'Link Service' dropdown menu is set to 'SnaDlc1', and the 'Ethernet' checkbox is checked. The 'Comment' field contains 'Token-Ring to HQMVS2'. There is an unchecked checkbox for 'Supports Dynamic Remote APPC LU Definition'. Below this, there are three sections: 'Remote End' with radio buttons for 'Host System' (selected), 'Peer System', and 'Downstream'; 'Allowed Directions' with radio buttons for 'Outgoing Calls' (selected), 'Incoming Calls', and 'Both Directions'; and 'Activation' with radio buttons for 'On Server Startup' (selected), 'On Demand', and 'By Administrator'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

Select the Address tab in the Connection Properties box. Enter the Remote Network Address and the Remote SAP address. (Refer to [Figure 6-5](#)).

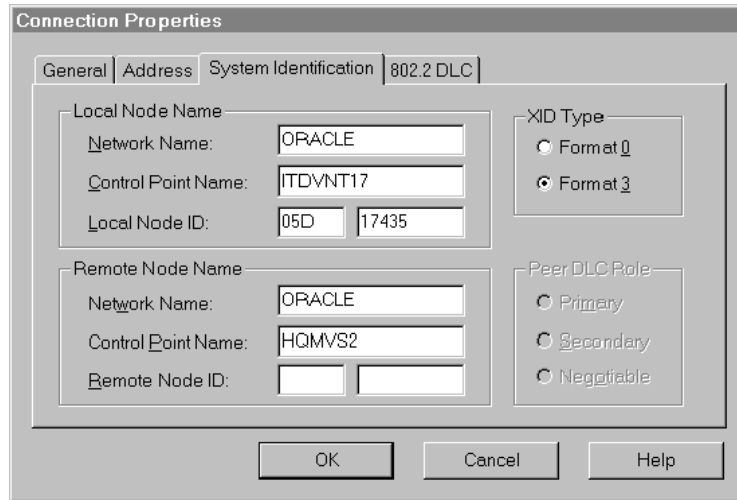
**Figure 6-5 Enter Remote Address**

The screenshot shows the 'Connection Properties' dialog box with the 'Address' tab selected. The 'Remote Network Address' field contains '400000FFFFFF' and the 'Remote SAP Address' field contains '04'. At the bottom are 'OK', 'Cancel', and 'Help' buttons.

Now, select the System Identification tab. Under Local Node Name, enter the Network Name, Control Point Name, and Local Node ID.

Under Remote Node Name, enter the Network Name, Control Point Name, and optionally, the Remote Node ID. The XID Type should be set to Format 3. (Refer to [Figure 6-6](#)).

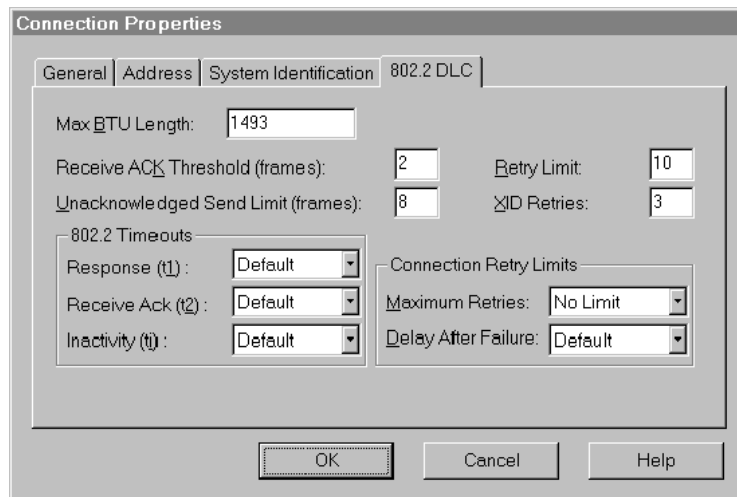
**Figure 6-6 Set System Identification**



Next, select the DLC tab in the Connection Properties box. In this example, the 802.2 DLC (Token Ring) is being used. For the 802.2 DLC, all of the defaults are usually acceptable. If you need to change any values, then do so now.

Now, all the connection properties are set. Click **OK** to continue. (Refer to [Figure 6-7](#)).

**Figure 6-7 Select DLC**



## 6.4.4 Local LU Definition

You must create a local logical unit (LU) definition. The local LU definition describes the SNA LU through which the gateway communicates with OLTP systems.

From the Insert menu, select **Local APPC LU**. The local LU Properties dialog box appears.

Select the **General** tab. Enter the LU alias, Network Name and LU Name. Ensure that the APPC Syncpoint Support box is not checked. (Refer to [Figure 6-8](#)).

**Figure 6-8 Select Local APPC LU Properties- Enter General LU Properties**

The screenshot shows the 'Local APPC LU Properties' dialog box with the 'General' tab selected. The fields are as follows:

LU Alias:	HQCC101
Network Name:	ORACLE
LU Name:	HQCC101
Comment:	
APPC SyncPoint Support	<input type="checkbox"/>

Buttons at the bottom: OK, Cancel, Help.

Select **Advanced** tab of the Local APPC LU Properties box. Check the Member of Default Outgoing Local APPC LU Pool check box. Set the LU 6.2 Type to Independent to allow parallel sessions. (Refer to [Figure 6-9](#)).

Now, the Local LU properties are all set. Click **OK** to continue.

**Figure 6-9 Select Local APPC LU Properties Advanced Tab**

The screenshot shows the 'Local APPC LU Properties' dialog box with the 'Advanced' tab selected. The fields are as follows:

Member of Default Outgoing Local APPC LU Pool	<input checked="" type="checkbox"/>
Timeout for Starting Invokable TPs	60 sec
Implicit Incoming Remote LU	<None>
LU 6.2 Type	<input checked="" type="radio"/> Independent <input type="radio"/> Dependent
LU Number	0
Connection	<None>

Buttons at the bottom: OK, Cancel, Help.

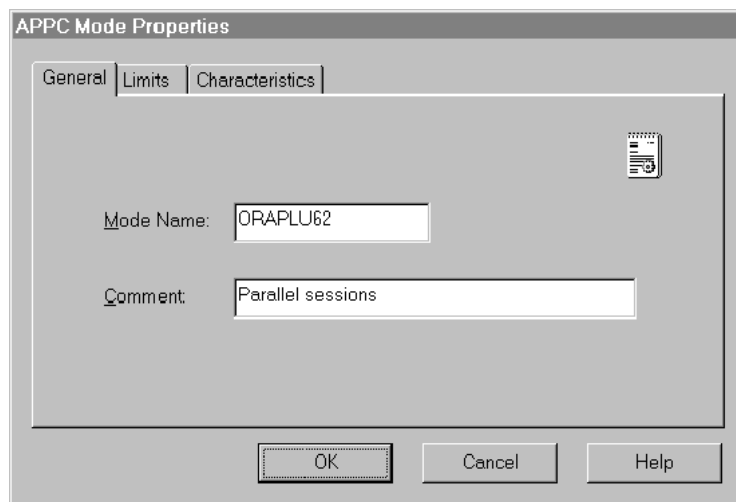
## 6.4.5 Mode Definition

This definition describes an SNA mode entry to be used when establishing sessions between LUs. The mode defined here must match a mode defined on the target system.

From the Insert menu, select **APPC Mode Definition**. The APPC Mode Properties dialog box appears.

Select the **General** tab. Enter the mode name. The mode name that you specify must be defined to the OLTP communications software. Choose the mode name in addition to other mode parameters after consulting the person responsible for configuring the OLTP communications software. (Refer to [Figure 6-10](#).)

**Figure 6-10** Open APPC Mode Properties Box - Enter Mode Name

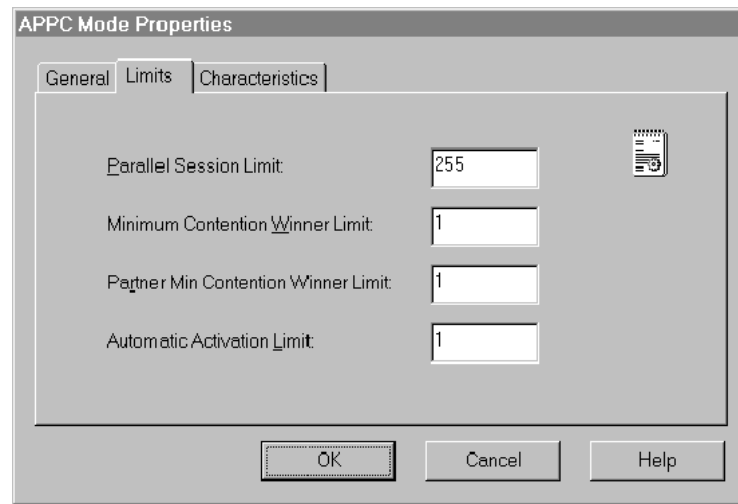




Next, select the **Limits** tab. Enter the Parallel Session Limit, Minimum Contention Winner Limit, Partner Min Contention Winner Limit, and Automatic Activation Limit values.

The Parallel Session limit determines the maximum number of concurrent conversations allowed between the gateway instance and the OLTP. This equates to the maximum number of concurrently active RTP calls through the gateway instance. (Refer to [Figure 6-11](#).)

**Figure 6-11 Select Mode Properties Limits Tab**

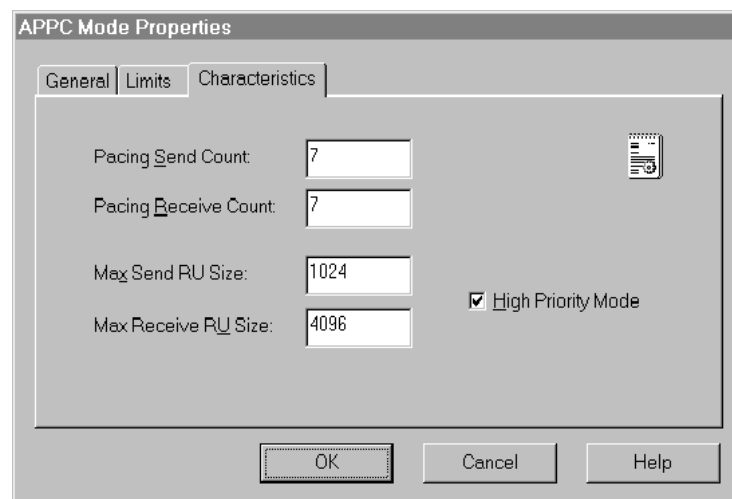


Now, select the **Characteristics** tab. Enter the Pacing Send Count, Pacing Receive Count, Max Send RU Size, and Max Receive RU size. For optimal performance, check the High Priority Mode check box.

The pacing and RU size parameters are performance-related and should be tuned to suit your application. For most installations, the values set in the example are sufficient. (Refer to [Figure 6-12](#)).

After you finish entering the values called for in this box, all the APPC mode properties will be set. Click **OK** at the bottom of the box to continue.

**Figure 6-12 Set Mode Properties Characteristics**

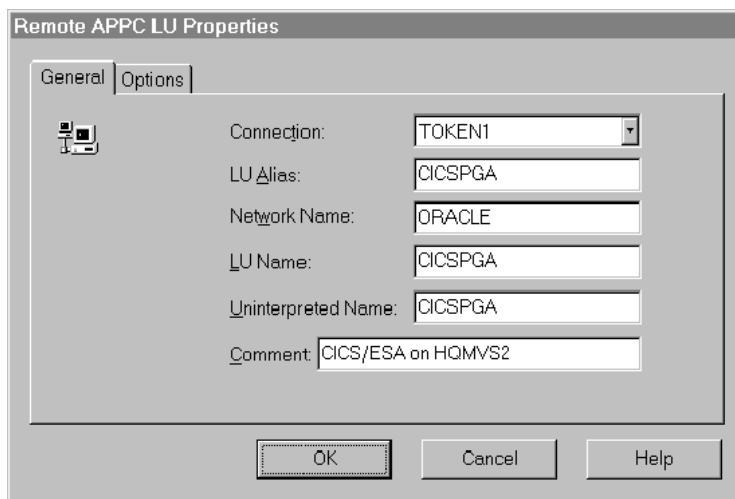


## 6.4.6 Remote LU Definition

This definition describes the SNA LU of the OLTP system with which the gateway communicates. You must create a remote LU definition for the remote OLTP system. Determine the link with which to associate the LU (in the example, it is `TOKEN1`). From the Insert menu, select **APPC Remote LU**. The Remote APPC LU Properties dialog box appears.

Select the **General** tab. Use the Connection drop-down menu to select the connection used to access this LU. Enter the LU Alias, Network Name, LU Name, and Uninterpreted LU Name. You should contact the person responsible for your SNA network to determine the correct LU and network names. Note that you can use the LU Alias to define a name known only to SNA Server, and that name can remain the same even if the remote LU name changes. This helps to reduce the amount of maintenance required when network changes occur. (Refer to [Figure 6-13](#)).

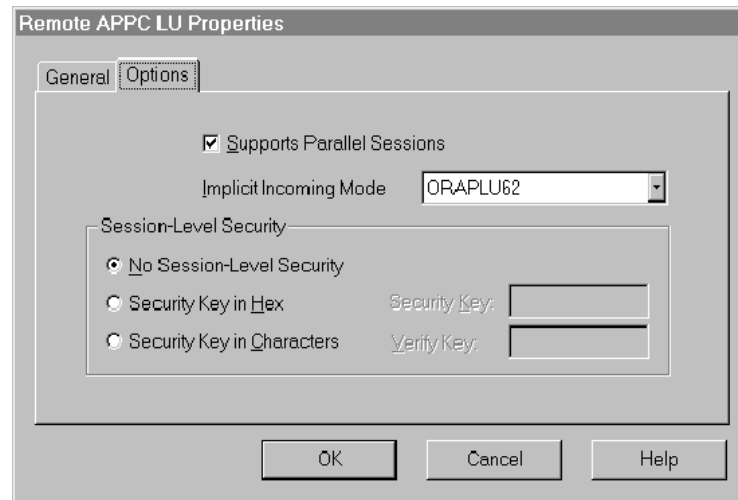
**Figure 6-13** Open Remote APPC LU Properties Box - Enter Remote LU Names



Now, select the **Options** tab. Check the **Supports Parallel Sessions** check box. Use the Implicit Incoming Mode drop-down menu to select the mode. Set any security options you need. (Refer to [Figure 6-14](#)).

Once you have filled in the suitable values in the Remote APPC LU Properties box, the APPC LU properties will be set. Click **OK** to continue.

**Figure 6-14 Select LU Properties Options**

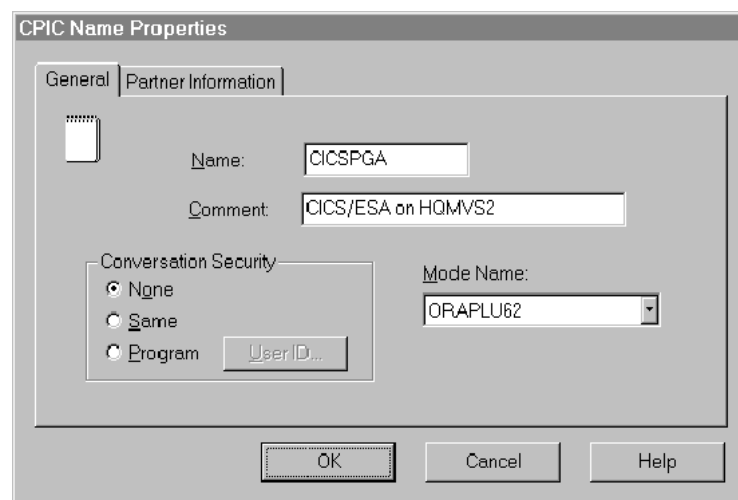


## 6.4.7 CPI-C Symbolic Destination Name

When the Local and Remote Partner definitions and Mode definitions have been created, you can create CPI-C Symbolic Destination Names, also called side information. The side information is used to identify target OLTP systems to be accessed through the gateway. From the Insert menu, select **APPC CPIC Symbolic Name**. The CPIC Name Properties dialog box appears.

Select the **General** tab. Enter a Name for the side information. From the Mode Name drop-down list, select the suitable mode. (Refer to [Figure 6-15](#)).

**Figure 6-15 CPI-C Name Properties Box - Enter Side Information Name and Mode**

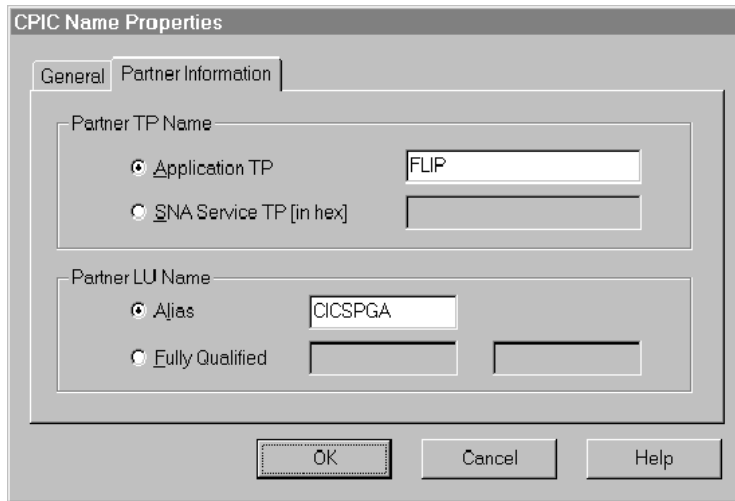


Now, select the **Partner Information** tab. Select Application TP and enter the TP name. If you plan to define one CPI-C Symbolic Destination Name for accessing multiple transaction programs at an OLTP, then you can enter a dummy TP Name at this time. The TP Name is overridden by the gateway at run time.

Enter the Partner LU Name alias. (refer to [Figure 6-16](#)).

Click **OK** to save the side information.

**Figure 6-16 Select CPI-C Partner Information**



Configuration of the Microsoft Host Integration Server is now complete. Proceed to ["Testing the Connection"](#) on page 6-23.

## 6.5 Configuring an IBM Communications Server

If you are using IBM Communications Server as your SNA Server, then read the following sections to learn how to configure it to communicate with the Oracle Procedural Gateway for APPC.

### 6.5.1 Independent And Dependent LUs

Oracle recommends independent LUs for the Oracle Procedural Gateway for APPC because they support multiple parallel sessions or conversations. This means that multiple Oracle client applications can be active simultaneously with the same OLTP through the independent LU.

Dependent LUs support only a single active session. The CP (Control Point for the node, which is IBM Communications Server, in this case) queues additional conversation requests from the gateway server behind an already active conversation. In other words, conversations are single-threaded for dependent LUs.

If a gateway LU is correctly defined, then no alterations to the Oracle Procedural Gateway for APPC configuration are needed, nor should any changes be needed to the gateway server.

The operational impact of dependent LUs is that the first client application can initiate a conversation through the Procedural Gateway with the gateway server. While that transaction is active (which could be seconds to minutes to hours, depending on how the client application and transaction are designed), any other client application initiating a session with the same gateway server appears to hang as it waits behind the previous session.

If a production application really uses only a single conversation at any one time, then there should be no impact.

However, additional concurrent conversations might be required for testing or for other application development. Each requires that additional dependent LUs be defined on the remote host, plus additional IBM Communication Server configuration entries, which define the additional dependent LUs on the host Windows system.

Additional side information profiles should be defined to use the new dependent LUs. New gateway instances should be created and configured to use these new side information profiles.

Refer to `PGAU DEFINE TRANSACTION SIDEPROFILE` and `LUNAME` parameters in Chapter 2, "Procedural Gateway Administration Utility," in the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows*.

### 6.5.2 Definition Types

Several types of IBM Communications Server definitions are relevant to gateway APPC/LU6.2 operation. Each definition can be created and edited using a corresponding SNA Node Configuration menu.

The definitions relevant to the gateway are presented here in hierarchical order. Those definition types that are lowest in the hierarchy are discussed first. This matches the logical sequence in which to create the definitions.

Refer to the IBM Communications Server online documentation for a complete discussion of IBM Communications Server definitions. This section provides an overview of IBM Communications Server definitions in relation to the Oracle Procedural Gateway for APPC.

## 6.6 Creating IBM Communications Server Definitions for the Gateway

IBM Communications Server definitions are created using the SNA Node Configuration tool, while the actual operation of the server is done using the SNA Node Operations tool, both of which are provided with IBM Communications Server.

Maintenance of SNA definitions is normally done by a user with Administrator privileges.

The following sections describe the process of creating your SNA definitions for IBM Communications Server using the SNA Node Configuration tool. All the tasks described in this section are performed within SNA Node Configuration.

### 6.6.1 Creating the Configuration

SNA Node Configuration will first ask you if you are creating a new configuration or loading an existing configuration. These tasks are based on the assumption that a new configuration is being created.

SNA Node Configuration will next prompt you for a configuration scenario.

### 6.6.2 Creating the Node

Each SNA Server must have a control point defined. This is typically called the Node definition. To define the node:

1. Click **Node**.
2. Click **Create**.
3. In the Define the Node dialog box, select the **Basic** tab. Enter the Control Point, Local Node ID, and Node Type information.

You can select Advanced tab options, depending on your SNA network configuration.

4. Click **OK**.

### 6.6.3 Creating Devices

Configure Communication Devices next. Follow these instructions:

1. Click **Devices**.
2. Click **Create**.

### 6.6.4 Choosing the Device Type

Select the type of device to use for communication. The LAN type is typical for either Ethernet or Token Ring attached network devices.

### 6.6.5 Configuring a LAN Device

Configure a LAN device next. Follow these instructions:

1. Select the **Basic** tab. Select the adapter to use and the Local SAP.  
The other tabs provide options on network tuning parameters.
2. Click **OK**.

## 6.6.6 Creating Peer Connections

Configure Peer Connections next. Follow these instructions:

1. Click **Peer Connections**.
2. Click **Create**.

## 6.6.7 Defining the Link Station

Define the Link Station next. Follow these instructions:

1. In the Basic tab, enter a Link Station name for this connection.
2. Choose the device for the connection.
3. Enter the Destination address and Remote SAP.

## 6.6.8 Defining the Adjacent Node

Define the Adjacent Node next. Follow these instructions:

1. Select the **Adjacent Node** tab.
2. Enter the Adjacent CP name of the remote system and pick its CP type. You may have to choose a different transmission group (TG) than the default. Consult your SNA network administrator for details.

Other tabs provide options on tuning and reactivation.

3. Click **OK**.

## 6.6.9 Creating Local LUs

Create Local LUs for this node next. Follow these instructions:

1. Click **Local LU 6.2 LUs**.
2. Click **Create**.

## 6.6.10 Defining Local LUs

Define Local LUs next. Follow these instructions:

1. In the Basic tab, enter the name of the Local LU, and, optionally, an alias. The name must match the Local LU definition of the remote host for this node.

You can examine the other tab for synchronization support and for LU session limits.

2. Click **OK**.

## 6.6.11 Creating Partner LUs

Create remote Partner LUs next. Follow these instructions:

1. Click **Partner LU 6.2 LUs**.
2. Click **Create**.

### 6.6.12 Defining Partner LUs

Define Partner LUs next. Follow these instructions:

1. In the Basic tab, enter the name of the Remote or Partner LU, and, optionally, an alias.
2. Select the Fully Qualified CP from the Existing list.  
You can examine the other tab for logical record limits and security support.
3. Click OK.

### 6.6.13 Creating the CPI-C Side Information Profile

Next, define the CPI-C profile that will be used to create the gateway. Follow these instructions:

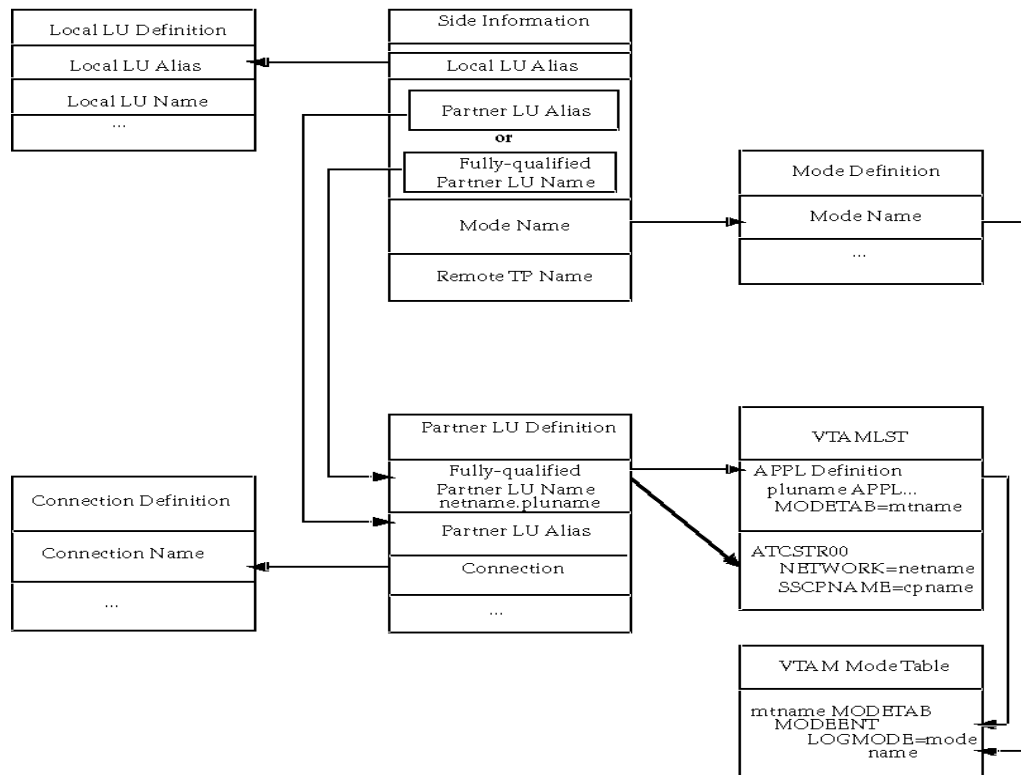
1. Click the **CPI-C Side Information Definitions**.
2. Click **Create**.

## 6.7 Testing the Connection

Before proceeding with the gateway configuration tasks, ensure that your connection is working. You can do this by using the Microsoft Host Integration Server (SNA Server Manager).

Figure 6-17 shows the relationship between SNA Server definitions and the VTAM definitions on the host.

**Figure 6-17 Relationship Between SNA Server Definitions and Host VTAM**





## 6.8 Resume Configuration of the Gateway

When you have finished configuring the SNA Server for your Windows system, proceed to [Chapter 8, "Configuring the OLTP"](#) to continue configuring the network.



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## Configuring the TCP/IP Communications Package for IMS Connect

Read this chapter if your gateway uses the TCP/IP communication protocol. It describes how to configure TCP/IP for IMS Connect feature for Microsoft Windows. TCP/IP is a communication protocol that is already a part of your operating system. No third-party protocol software is required. This chapter contains the following section:

- [Configuring TCP/IP for IMS Connect on Windows Platforms](#)

## 7.1 Configuring TCP/IP for IMS Connect on Windows Platforms

The configuration process requires you to enter parameters that are unique to your system in order to properly configure TCP/IP. Ask your network administrator to provide you with a list of the installation parameters you will need to complete the configuration process.

Basic configuration consists of assigning a host name, an IP address, and a network mask to a given network interface. This basic configuration should have been completed already by your systems administrator. If not, contact your systems administrator to have this configuration completed before you continue.

Additional configuration consists of defining a name server IP Address or creating entries in the hosts file on the local computer. Name Servers translate host names into IP addresses when queried on a particular host name. The hosts file provides this same functionality but in a non-network participating manner.

For local configuration, (that is, if the gateway is on the same computer), it may be desirable to use the loop-back address. The IP address is 127.0.0.1 and is typically given the local name (localhost or loopback) in the hosts file. Using the loop-back address reduces the amount of network overhead by handling the traffic internally without actually talking to the network.

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**Note:** The Oracle Procedural Gateway for APPC using TCP/IP support for IMS Connect has specific initialization file parameters. These parameters are located in %ORACLE\_HOME%\pg4appc\admin\initsid.ora. For information on these parameters, refer to "[Gateway Initialization Parameter File Using TCP/IP](#)" on page B-2.

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For additional information about configuring TCP/IP for a particular host operating system, refer to the suitable platform and operating system installation and configuration guides.

When you have finished configuring TCP/IP for IMS Connect for the gateway, proceed to [Chapter 8, "Configuring the OLTP"](#) to complete and verify the configuration processes.

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## Configuring the OLTP

The following sections detail how to configure the OLTP.

- **If your communications protocol is SNA:** proceed to [Section 8.1, "Configuring the OLTP for Your SNA Environment"](#) on page 8-2.
- **If your communications protocol is TCP/IP:** proceed to [Section 8.2, "Configuring the OLTP for Your TCP/IP Environment"](#) on page 8-8.

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**Note:** On a gateway using TCP/IP support for IMS Connect, you must specify `EDIT=ULC` in the IMS TRANSACT macro if you need input case sensitivity. When using SNA support, you need not specify `EDIT=ULC` in the IMS TRANSACT macro.

---

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## 8.1 Configuring the OLTP for Your SNA Environment

The steps for configuring your OLTP to communicate with the Oracle Procedural Gateway for APPC vary, depending on which OLTP you are using and on which platform the OLTP is running. CICS Transaction Server for z/OS, IMS/TM, APPC/MVS, IDMS-DC and z/OS are the currently supported OLTPs. Choose the instructions suitable to your OLTP from the following sections:

- "Configuring CICS Transaction Server for z/OS" on page 8-2
- "Configuring IDMS-DC" on page 8-4
- "Configuring IMS/TM" on page 8-6
- "Configuring APPC/MVS" on page 8-7

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**Note:** You need only perform the configuration steps for an OLTP if this is a first-time configuration for that OLTP.

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### Configuring CICS Transaction Server for z/OS

If your OLTP is CICS Transaction Server for z/OS, then perform the following steps to configure it for communication with the gateway:

1. Configure MVS VTAM for the SNA Server that will make the APPC connection to your system. At least one independent LU must be available to the gateway.
2. Check the VTAM logmode table used by the CICS Transaction Server for z/OS. (The table name is specified in the `MODETAB` parameter in the VTAM APPL definition for CICS.) Ensure that an entry exists for APPC sessions with parallel session and sync-level support.

The `oraplu62.asm` file in the `%ORACLE_HOME%\pg4appc\sna` directory contains a sample mode entry, including comments that indicate the required values in the mode entry.

3. Using your file transfer facility, transfer the following files from the `%ORACLE_HOME%\pg4appc\demo\CICS` directory to the z/OS system on which you run CICS Transaction Server for z/OS:
  - `dfhcsdup.jcl` - JCL to run the CICS `DFHCSDUP` utility
  - `pgaflip.asm` - assembler source for the CICS `FLIP` transaction
  - `pgaflip.jcl` - JCL to assemble and linkedit the CICS `FLIP` transaction
4. Using the comments in the `dfhcsdup.jcl` file, tailor the JCL and input statements to match your system setup, and submit it for batch execution. Performing this step updates your Transaction Server for z/OS system definitions.
5. Using the instructions in the `pgaflip.jcl` file comments, tailor the JCL to match your system setup, and submit it for batch execution. Performing this step assembles and linkedit the `pgaflip.asm` file into a load module library accessible to your Transaction Server for z/OS through the `DFHRPL DD` statement in the CICS startup procedure.
6. Log on to your CICS Transaction Server for z/OS and enter the following transaction:

```
CEDA INSTALL GROUP(ORAPGA)
```

This transaction installs the CICS connection and session definitions for APPC communication with the gateway on Windows. It also installs definitions for the sample CICS programs and transactions provided with the gateway.

Your CICS Transaction Server for z/OS configuration is now complete.

## Configuring IDMS-DC

If your OLTP is IDMS-DC, then perform the following steps to configure IDMS-DC and z/OS for communication with the gateway:

1. Configure MVS VTAM for the Windows SNA Server that will make the APPC connection to your system. At least one independent LU must be available for use by the gateway.
2. If your IDMS-DC system does not have APPC support, then set up a separate MVS VTAM APPL definition for use by the IDMS-DC LU6.2 interface. IDMS-DC cannot use the same VTAM APPL for both VTAM terminal and VTAM APPC support.

For additional information, refer to vendor documentation.

3. Check the VTAM logmode table used by IDMS-DC. (The table name is specified in the `MODETAB` parameter in the VTAM APPL definition for IDMS-DC.) Ensure that an entry exists for APPC sessions with parallel session and sync level support. The `oraplu62.asm` file in the `%ORACLE_HOME%\pg4appc\sna` directory contains a sample mode entry, including comments that indicate the required values in the mode entry.

4. Modify the Mode Profile to be used for your IDMS-DC connections.

To bypass a bug in IDMS-DC, set the Auto `ACTIVATIONS` limit field to the same value as the maximum number of `SESSIONS` field. Without this setting, IDMS-DC rejects the first data packet received from Windows on each conversation, making it impossible for the gateway to communicate with an IDMS-DC transaction.

5. Using *CA-IDMS System Generation* as a guide, perform the following IDMS tasks:
  - a. Enable the IDMS-DC multiple session service manager, `RHCCNOS`.
  - b. Define a VTAM line for APPC use, if one is not already defined.
  - c. Define `PTERMs` and `LTERMs` for communications with the Windows independent LU, as defined to VTAM on z/OS.

Set up two `PTERM/LTERM` definitions to use the `SNASVCMG` mode entry for communications between the SNA Service Managers on MVS and Windows. Set up one of these definitions as a contention winner and set up the other one as a contention loser. Set up additional `PTERM/LTERM` definitions to use the mode entry defined in the SNA Server. Profile `DEFINE/MODE` entry for use by the gateway sessions. One `PTERM/LTERM` definition is required for each concurrent session with the gateway. Set up these definitions with contention off.

In the `%ORACLE_HOME%\pg4appc\demo\IDMS` directory, the `appcdef.doc` file provides sample IDMS-DC definitions for a VTAM line with `PTERMs` and `LTERMs`.

- d. Define the IVP and sample programs and transactions to IDMS-DC.

In the `%ORACLE_HOME%\pg4appc\demo\IDMS` directory, the `trandef.doc` file provides sample IDMS-DC definitions for the IVP and sample programs and transactions. These definitions should not be modified.



6. Using your file transfer facility, transfer the following files from the %ORACLE\_HOME%\pg4appc\demo\IDMS directory to the z/OS system on which you run IDMS-DC:
  - pgaflip.asm - the assembler source for the IDMS-DC FLIP program
  - pgaflip.jcl - JCL to assemble and linkedit the IDMS-DC FLIP program
7. Using the comments in the pgaflip.jcl file, tailor the JCL to match your system setup and submit it for batch execution. Performing this step assembles and linkedit the pgaflip.asm file into a load module library accessible to your IDMS-DC system through the CDMSLIB DD statement in the IDMS-DC startup procedure.

The IDMS-DC configuration is now complete.

## Configuring IMS/TM

If your OLTP is IMS/TM, then perform the following steps to configure IMS/TM and z/OS for communication with the gateway:

1. Configure the IMS system for use with APPC.
2. Configure MVS VTAM for the SNA APPC connection to Windows. At least one independent LU must be available for use by the gateway, unless you are using the IMS LU6.1 Adapter for LU6.2 applications. In this case, you must have one dependent LU defined for each concurrent session. For example, if you want to support 10 concurrent sessions, then you must have 10 dependent LUs defined.
3. Check the VTAM logmode table used by IMS/TM. The table name is specified by the `MODETAB` parameter in the VTAM APPL definition.

For APPC/IMS, ensure that an entry exists for APPC sessions with sync-level support and parallel session support. The `oralu62.asm` and `oraplu62.asm` files in the `%ORACLE_HOME%\pg4appc\sna` directory contain sample mode entries for single session and parallel session support, respectively. The samples include comments that indicate the required values in the mode entries.

4. Using your file transfer facility, transfer the following files from the `%ORACLE_HOME%\pg4appc\demo\IMS` directory to the z/OS system on which you run IMS/TM:
  - `pgaflip.asm` is assembler source for IMS FLIP transaction;
  - `pgaflip.jcl` is JCL to assemble and linkedit IMS FLIP transaction;
  - `imsgen.asm` is IMS stage 1 gen definitions for the IMS FLIP transaction.
5. Add the statements in the `imsgen.asm` file to your IMS stage 1 gen and run your IMS stage 1 and stage 2 gens. Use the online change utility to enable the new transaction definition.
6. Using the comments in the `pgaflip.jcl` file, tailor the JCL to match your system setup and submit it for batch execution. This assembles and linkedit the `pgaflip.asm` file into a load module library that is accessible to your IMS/TM system and creates a PSB and an ACB for the `FLIP` transaction.
7. Perform the tasks necessary on your system to make the new transaction available to IMS/TM. Depending on your system setup, you might have to restart IMS.

The IMS/TM configuration is now complete.

## Configuring APPC/MVS

If your OLTP is APPC/MVS, then perform the following steps to configure APPC/MVS for communication with the gateway:

1. Configure MVS VTAM for the SNA APPC connection to Windows. At least one independent LU must be available for use by the gateway.
2. Check the VTAM logmode table used by APPC/MVS. (The table name is specified by the `MODETAB` parameter in the VTAM APPL definition for APPC/MVS.) Ensure that an entry exists for APPC sessions with sync level and parallel session support. The `orapl62.asm` file in the `%ORACLE_HOME%\pg4appc\sna` directory contains a sample mode entry, including comments that indicate the required values in the mode entry.
3. Allocate a partitioned dataset (PDS) on your z/OS system where the sample files are placed. The PDS should be allocated with `RECFM=FB`, `LRECL=80`, and a `BLKSIZE` suitable for the device type on which it resides. Approximately two tracks of 3390 disk space are required with one directory block. Oracle suggests naming this partitioned dataset (PDS) `ORAPGA.APPCMVS.SAMPLIB`.
4. Using the file transfer facility, transfer the following files from the `%ORACLE_HOME%\pg4appc\demo\MVS` directory to the z/OS PDS you allocated in the previous step, using the following specified member names:
  - `pgaflip.jcl` is JCL to add an APPC/MVS TP profile and to define the execution environment for the transaction. Store this file in your z/OS PDS as member `PGAFLIPJ`.
  - `pgaflip.rex` is the REXX source for the APPC/MVS `PGAFLIP` transaction. Store this file in your z/OS PDS as member `PGAFLIP`.
5. Using the comments in the `pgaflip.jcl` file, tailor the JCL to match your system setup and submit it for batch execution. Performing this step defines the APPC/MVS TP profile for the `PGAFLIP` transaction and stores it in the APPC/MVS profile dataset. Ensure that you change the dataset name in the JCL to match the name of the z/OS PDS allocated in Step 3.

The APPC/MVS configuration is now complete.

- Now that you have completed configuration of the network on a gateway using the SNA protocol, proceed to [Chapter 9, "Gateway Configuration Using SNA Communication Protocol"](#).
- If you wish to configure commit-confirm, then instructions for this configuration can be found in [Section 9.8, "Configuring Commit-Confirm"](#).

## 8.2 Configuring the OLTP for Your TCP/IP Environment

These are the steps for configuring the OLTP to communicate with Oracle Procedural Gateway for APPC using TCP/IP for IMS Connect. IMS/TM, through IMS Connect, is the only supported OLTP for this release of the gateway.

Perform the following steps to configure IMS/TM and z/OS for communication with the gateway:

1. Configure the IMS system.
2. Configure IMS Connect.

For information on how to configure IMS Connect, refer to the IBM *IMS Connect Guide and Reference*.

3. Using your file transfer facility, transfer the following files from the %ORACLE\_HOME%\pg4appc\demo\IMS directory to the z/OS system on which you run IMS/TM:
  - pgaflip.asm is assembler source for IMS FLIP transaction;
  - pgaflip.jcl is JCL to assemble and linkedit IMS FLIP transaction;
  - imsgen.asm is IMS stage 1 gen definitions for the IMS FLIP transaction.
4. Add the statements in the imsgen.asm file to the IMS stage 1 gen and run your IMS stage 1 and stage 2 gens. Use the online change utility to enable the new transaction definition.
5. Using the comments in the pgaflip.jcl file, tailor the JCL to match your system setup and submit it for batch execution. This assembles and linkedit the pgaflip.asm file into a load module library that is accessible to your IMS/TM system and creates a PSB and an ACB for the FLIP transaction.
6. Perform the tasks necessary on your system to make the new transaction available to IMS/TM. Depending on your system setup, you might have to restart IMS.

The IMS/TM configuration is now complete.

- At this point, proceed to [Chapter 10, "Gateway Configuration Using TCP/IP Communication Protocol"](#) to complete configuration of the gateway and its components.

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# Gateway Configuration Using SNA Communication Protocol

This chapter outlines the steps needed to configure the Oracle Integrating Server for a gateway using the SNA protocol on the Microsoft Windows platform. It also shows you how to configure commit-confirm, should you choose to implement it.

This chapter also provides the steps necessary to verify installation and configuration of the gateway components, including optional commit-confirm. It contains the following sections:

- [Before You Begin](#)
- [Preparing to Configure a Gateway Installation/Upgrade](#)
- [Integrating Server Configuration: First-Time Gateway Installations](#)
- [Upgrading or Migrating the Oracle Server from Previous Gateways](#)
- [Configuring the Oracle Integrating Server for Gateways to Coexist](#)
- [Optional Configuration Steps to Permit Multiple Users](#)
- [Configuring the Gateway](#)
- [Configuring Commit-Confirm](#)
- [Verifying the Gateway Installation and OLTP Configuration](#)
- [Performing Postinstallation Procedures](#)

Configuring the Oracle Procedural Gateway for APPC using SNA involves working with the following components:

- the Oracle Integrating Server
- your Microsoft Windows system
- your network
- the OLTP

## 9.1 Before You Begin

This chapter requires you to input parameters unique to your system in order to properly configure the gateway and SNA communications interface.

Refer to [Appendix E, "Configuration Worksheet"](#) for a worksheet listing the installation parameters you will need to know before you can complete the configuration process. Ask your network administrator to provide you with these unique parameter names before you begin.

## 9.2 Preparing to Configure a Gateway Installation/Upgrade

There are three ways to establish the gateway-Oracle Integrating Server relationship when you are installing or upgrading/migrating the gateway:

- When the Oracle Integrating Server and the gateway are installed in the same ORACLE\_HOME on the same machine
- When the Oracle Integrating Server and the gateway are installed on separate machine
- When the Oracle Integrating Server and the gateway are on the same machine but in different directories

Depending on the location of your gateway and your Oracle Integrating Server, you may need to transfer some of the gateway administrative files to the location where your Oracle Integrating Server is installed.

Follow the instructions suitable to your combination of the gateway-Oracle Integrating Server locations listed below.

### When the Oracle Integrating Server and the gateway are installed in the same ORACLE\_HOME on the same machine

You do not need to transfer files. Proceed to ["Integrating Server Configuration: First-Time Gateway Installations"](#) on page 9-3.

### When the Oracle Integrating Server and the gateway are installed on separate machine

1. Locate the gateway administrative files in the gateway %ORACLE\_HOME%\pg4appc\admin directory. All files in this directory that have the suffix .sql, .pkh, and .pkb must be copied into a similarly-named directory in the Oracle Integrating Server's Oracle home directory.
2. Now, locate the gateway demo files and subdirectories in the gateway's %ORACLE\_HOME%\pg4appc\demo directory. Copy the pgavsn.sql and pgaecho.sql files into a similarly named directory in the Oracle Integrating Server.
3. Copy the other subdirectories and files related to your installed OLTP on your remote host. For example, if you have CICS as your only OLTP, then copy the gateway %ORACLE\_HOME%\pg4appc\demo\CICS files into a similarly named directory in the Oracle Integrating Server.

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**Note:** Before transferring the files from the %ORACLE\_HOME%\pg4appc\demo directory, make sure that you have generated your required TIPs. You need to transfer the TIPs as well.

Refer to the Oracle Procedural Gateway for APPC *User's Guide* for information about generating TIPs using PGAU.

---

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### When the Oracle Integrating Server and the gateway are on the same machine but in different directories

You must change your gateway's Oracle home to the Oracle Integrating Server's Oracle home directory.

1. For example, if your gateway's Oracle home is set as follows:

```
C:\> echo %ORACLE_HOME%
```

```
C:\oracle\pga\10.2
```

and your server's Oracle home is located in the \oracle\pga\10.2 directory, then you need to do the following:

```
C:\> SET ORACLE_HOME=C:\oracle\pga\10.2
```

2. Now create the directories with the following commands:

```
C:\> cd %ORACLE_HOME%
C:\> mkdir pg4appc
C:\> mkdir pg4appc\admin
```

3. Use whatever file transfer mechanism is available on your system to copy all the .sql, .pkh, and .pkb files from the gateway Oracle home %ORACLE\_HOME%\pg4appc\admin directory to the Oracle Integrating Server's Oracle home %ORACLE\_HOME%\pg4appc\admin directory.
4. You may also transfer the demo files from the gateway directory to the Oracle Integrating Server directory. Copy the files and the directory recursively from the gateway Oracle home %ORACLE\_HOME%\pg4appc\demo directory to the Oracle Integrating Server %ORACLE\_HOME%\pg4appc\demo directory.

For example:

```
C:\> cd %ORACLE_HOME%\pg4appc
C:\> mkdir\demo
C:\> cd demo
C:\> xcopy C:\oracle\pga\10.2\demo /E /I /Q
```

---

**Note:** Before transferring the files from the %ORACLE\_HOME%\pg4appc\demo directory, make sure that you have generated the required TIPs. You need to transfer the TIPs as well.

Refer to the Oracle Procedural Gateway for APPC *User's Guide* for information about generating TIPs using PGAU.

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If this is a first-time installation, then proceed with "[Integrating Server Configuration: First-Time Gateway Installations](#)" on page 9-3.

If this is an upgrade, then proceed with "[Upgrading or Migrating the Oracle Server from Previous Gateways](#)" on page 9-6.

Following those steps, you may want to perform the [Optional Configuration Steps to Permit Multiple Users](#), on page 9-8.

## 9.3 Integrating Server Configuration: First-Time Gateway Installations

Follow these steps to configure your Oracle Integrating Server if you have installed Oracle Procedural Gateway for APPC for the first time:

1. Ensure that the UTL\_RAW PL/SQL package has been installed on your Oracle Integrating Server. All PGAU-generated TIP specifications use UTL\_RAW, which provides routines for manipulating raw data.
  - a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. From SQL\*Plus, enter the following command:

```
SQL> DESCRIBE UTL_RAW
```

The DESCRIBE statement produces output on your screen. If you browse through the output, then you should see some functions, including a compare function. If you do not see this output, then continue the UTL\_RAW installation by performing Step d below.

If the DESCRIBE statement indicates success, then your Oracle Integrating Server has UTL\_RAW installed and you can proceed to Step 2.

- c. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
- d. From SQL\*Plus, run the utlraw.sql and prvtrawb.plb scripts in the Oracle Integrating Server's %ORACLE\_HOME%\rdbms\admin directory, in the following order:

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @utlraw.sql
SQL> @prvtrawb.plb
```

2. Ensure that the DBMS\_OUTPUT standard PL/SQL package is enabled on your Oracle Integrating Server. The sample programs and installation verification programs on the distribution media use this standard package.
  - a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. From SQL\*Plus, enter the following command:

```
SQL> DESCRIBE DBMS_OUTPUT
```

The DESCRIBE statement produces output on your screen. If you browse through that output, you should see some functions, including a put\_line function.

If you do not see this output, then you must create the DBMS\_OUTPUT package. Refer to the *Oracle Database Application Developer's Guide - Fundamentals* for more information about creating the DBMS\_OUTPUT package. After successful installation of the DBMS\_OUTPUT package, issue the DESCRIBE statement.

If the DESCRIBE statement indicates success, then your Oracle Integrating Server has DBMS\_OUTPUT created, and you can proceed to Step 3.

3. Install the UTL\_PG PL/SQL package. All PGAU-generated TIP specifications use UTL\_PG, which provides routines for performing numeric conversions to and from raw data.
  - a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. From SQL\*Plus, run the utlpg.sql and prvtpgb.plb scripts in the Oracle Integrating Server's %ORACLE\_HOME%\rdbms\admin directory, in the following order:

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @utlpg.sql
SQL> @prvtpgb.plb
```

4. Install the Heterogeneous Services (HS) catalogs.
  - a. If necessary, use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. Enter the following command:



```
SQL> DESCRIBE HS_FDS_CLASS
```

The DESCRIBE statement produces output on your screen. If the DESCRIBE statement indicates success, then heterogeneous services catalogs have been created on your Oracle Integrating Server and you can proceed to Step 5. otherwise follow the next step only if the DESCRIBE statement does not indicate success. Step c will create the Heterogeneous Services catalog.

- c. If it is necessary to create the Heterogeneous Services catalog, then enter the following command:

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @cath.s.sql
```

- 5. Create a public database link to access Oracle Procedural Gateway for APPC:

Use SQL\*Plus to connect to the Oracle Integrating Server as user SYSTEM. You can use the following SQL\*Plus sample whether the Oracle Integrating Server and the gateway are on the same system or on different systems. In the following sample, pgasrv is the *tns\_name\_entry* that will be assigned to the gateway when you modify the tnsnames.ora file later in this chapter.

```
SQL> CREATE PUBLIC DATABASE LINK PGA USING 'PGASRV'
```

- 6. Create the gateway administrator user PGAADMIN and install the PG DD.

- a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYSTEM.

- b. From SQL\*Plus, run the pgacr8au.sql script in the %ORACLE\_HOME%\pg4appc\admin directory. This script creates the PGAADMIN user ID.

The initial password defined for PGAADMIN is PGAADMIN. Use the ALTER USER command to change the password. For further information about password issues, refer to the *Oracle Database SQL Reference*.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgacr8au.sql
```

- c. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.
- d. From SQL\*Plus, run the pgddcr8.sql script in the %ORACLE\_HOME%\pg4appc\admin directory. This script installs the PG DD.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddcr8.sql
```

- e. From SQL\*Plus, connect to the Oracle Integrating Server as user SYS.

- f. Grant execution privileges on DBMS\_PIPE to PGAADMIN:

```
SQL> GRANT EXECUTE ON DBMS_PIPE TO PGAADMIN
```

- 7. Install the TIP trace access PL/SQL routines. These routines require that the DBMS\_PIPES standard PL/SQL package is installed and that PGAADMIN has execute privileges on it. For more information on DBMS\_PIPES, refer to the *Oracle Database Application Developer's Guide - Fundamentals*.

- a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.

- b. From SQL\*Plus, run the pgtiptr.sql script in the %ORACLE\_HOME%\pg4appc\admin directory. This script creates PL/SQL

routines that can be called to read and purge trace information created by PGAU-generated TIP specifications. It also creates public synonyms for these routines. The script prompts you for the necessary user IDs and passwords.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgatiptr.sql
```

8. Install the GPGLOCAL package. This package is required for compilation and execution of all PGAU-generated TIP specifications. TIP developers should be granted execute privileges on GPGLOCAL (refer to Step 3 of ["Optional Configuration Steps to Permit Multiple Users"](#) on page 9-8).
  - a. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.
  - b. From SQL\*Plus, run the gpglocal.pkh script in the %ORACLE\_HOME%\pg4appc\admin directory. This script compiles the GPGLOCAL package specification.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @gpglocal.pkh
```

- c. From SQL\*Plus, run the gpglocal.pkb script in the %ORACLE\_HOME%\pg4appc\admin directory. This script compiles the GPGLOCAL package body.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @gpglocal.pkb
```

## 9.4 Upgrading or Migrating the Oracle Server from Previous Gateways

Follow these instructions *only* if you have a previous version of the Oracle Procedural Gateway for APPC installed on your system and need to configure it for Release 10.2.0.1.0 of the gateway.

1. Upgrade your Oracle Procedural Gateway for APPC to current version levels as follows:
  - a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. Install the UTL\_RAW package body. From SQL\*Plus, run the prvtrawb.plb script from the %ORACLE\_HOME%\rdbms\admin directory. This script upgrades the UTL\_RAW package body.

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @prvtrawb.plb
```

- c. Install the UTL\_PG package body. From SQL\*Plus, run the prvtpgb.plb script from the %ORACLE\_HOME%\rdbms\admin directory. This script upgrades the UTL\_PG package body.

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @prvtpgb.plb
```

The prvtrawb.plb and prvtpgb.plb scripts should complete successfully. If they fail because specifications do not exist or were invalidated, then consider reinstalling the package specifications as directed in [Section 9.4.1, "If You Must Reinstall Package Specifications"](#).

## 9.4.1 If You Must Reinstall Package Specifications

If the UTL\_RAW or UTL\_PG package has been invalidated or removed, then the prvtrowb.plb and prvtpgb.plb scripts may not complete successfully, then, you might have to reinstall the package specifications.

If you do reinstall the package specifications, then any dependent objects (such as existing user TIPs and client applications) are invalidated and will subsequently need to be recompiled. The impact of this is a one-time performance delay while recompilation of the TIPs and dependent client applications proceeds.

---



---

**Important:** Before proceeding with reinstallation of the package scripts, make sure that you are in the %ORACLE\_HOME%\pg4appc\admin directory.

---



---

TIPs were split into separate specification and body files in release 3.3 to avoid cascaded recompilations in later releases.

### Step 1 Run the following scripts before proceeding with the PGAU upgrade

From SQL\*Plus, run the utlraw.sql script:

1. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
2. From SQL\*Plus, run the utlraw.sql and utlpg.sql scripts in the Oracle Integrating Server %ORACLE\_HOME%\rdbms\admin directory, in the following order, to upgrade their respective package specifications:

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @utlraw.sql
SQL> @utlpg.sql
```

### Step 2 Repeat installation of UTL\_RAW and UTL\_PG package body

After the scripts have run, repeat Steps 1b and c in [Section 9.4, "Upgrading or Migrating the Oracle Server from Previous Gateways"](#) on page 9-6. Then, proceed to the section titled "[Upgrading PGAU from Previous Gateway Releases](#)" on page 9-7.

---



---

**Note:** TIPs and dependent client applications must be recompiled after reinstallation of the package specifications. Refer to the "Compiling a TIP" section in Chapter 3 of the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* for information about compiling TIPs.

---



---

## 9.4.2 Upgrading PGAU from Previous Gateway Releases

1. Upgrade the PG DD as follows before executing the new PGAU:
  - a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.
  - b. From SQL\*Plus, run the pgddupgr.sql script in the %ORACLE\_HOME%\pg4appc\admin directory. This script upgrades the PG DD.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddupgr.sql
```

## 9.5 Configuring the Oracle Integrating Server for Gateways to Coexist

You may have an older version of the gateway already installed. Be aware that although a version 10 gateway can communicate with a version 9 data dictionary (PG DD), a version 9 gateway cannot communicate with a version 10 data dictionary. So, if you upgrade your data dictionary to version 10, no gateways which were configured with a version 9 data dictionary will be able to communicate with it.

## 9.6 Optional Configuration Steps to Permit Multiple Users

The following configuration steps are optional. Perform these steps if you want to permit users other than PGAADMIN to perform PG DD operations using PGAU.

1. Create public synonyms for the PG DD to allow other users to access the tables:
  - a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYSTEM.
  - b. From SQL\*Plus, run the `pgddcr8s.sql` script in the `%ORACLE_HOME%\pg4appc\admin` directory. This script creates public synonyms for the PG DD.
 

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddcr8s.sql
```
2. Create roles for accessing the PG DD, performing definitions of transactions, and generating TIP specifications. The PGAADMIN user can grant these roles to other users as necessary.
  - a. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.
  - b. From SQL\*Plus, run the `pgddcr8r.sql` script in the `%ORACLE_HOME%\pg4appc\admin` directory. This script creates two roles, PGDDDEF and PGDDGEN. The PGDDDEF role provides SELECT, INSERT, UPDATE, and DELETE privileges against some of the PG DD tables, and select privileges against others, and allows execution of the PGAU DEFINE, GENERATE, REDEFINE, REPORT, and UNDEFINE statements. The PGDDGEN role provides select privileges against the PG DD tables, and allows execution of the PGAU GENERATE and REPORT statements only.
 

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddcr8r.sql
```

3. Grant access to PGA required packages.

TIP developers require access to the following PL/SQL packages, which are shipped with the Oracle Integrating Server:

- DBMS\_PIPE in the `%ORACLE_HOME%\rdbms\admin` directory
- UTL\_RAW in the `%ORACLE_HOME%\rdbms\admin` directory
- UTL\_PG in the `%ORACLE_HOME%\rdbms\admin` directory

Explicit grants to execute these packages must be made to TIP developers.

These grants can be private, as in the following example:

```
C:\> sqlplus SYS\pw@database_specification_string
SQL> GRANT EXECUTE ON UTL_RAW TO tip_developer;
SQL> GRANT EXECUTE ON UTL_PG TO tip_developer;
SQL> GRANT EXECUTE ON DBMS_PIPE TO tip_developer;
SQL> CONNECT PGAADMIN\pw@database_specification_string
SQL> GRANT EXECUTE ON PGAADMIN.PURGE_TRACE TO tip_developer;
```

```
SQL> GRANT EXECUTE ON PGAADMIN.READ_TRACE TO tip_developer;
SQL> GRANT EXECUTE ON PGAADMIN.GPGLOCAL TO tip_developer;
SQL> exit
```

Alternatively, these grants can be public, as in the following example:

```
C:\> sqlplus SYS\pw@database_specification_string
SQL> GRANT EXECUTE ON UTL_RAW TO PUBLIC;
SQL> GRANT EXECUTE ON UTL_PG TO PUBLIC;
SQL> GRANT EXECUTE ON DBMS_PIPE TO PUBLIC;
SQL> CONNECT PGAADMIN\pw@database_specification_string
SQL> GRANT EXECUTE ON PGAADMIN.PURGE_TRACE TO PUBLIC;
SQL> GRANT EXECUTE ON PGAADMIN.READ_TRACE TO PUBLIC;
SQL> GRANT EXECUTE ON PGAADMIN.GPGLOCAL TO PUBLIC;
SQL> EXIT
```

You can use either private or public grants. Both grants are sufficient for using PGA. Public grants are easier and can be performed now. If you use private grants, then they must be issued each time a new TIP developer user ID is created.

SQL scripts for performing these grants are provided in the %ORACLE\_HOME%\pg4appc\admin directory. The pgddapub.sql script performs these grants for public access to the packages. The pgddadev.sql script performs the grants for private access to the packages by a single TIP developer. If you are going to use private grants, then you must run the pgddadev.sql script once for each TIP developer's user ID:

- a. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.
- b. From SQL\*Plus, run the suitable script (pgddapub.sql or pgddadev.sql) from the %ORACLE\_HOME%\pg4appc\admin directory. The script performs the necessary grants as described earlier. You are prompted for the required user IDs, passwords, and database specification strings.

If you are using private grants, then repeat this step for each user ID requiring access to the packages.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddapub.sql
or
SQL> @pgddadev.sql
```

4. If you are upgrading from a previous release of the gateway and if you want to upgrade your existing TIPs with new function and maintenance, then regenerate existing TIP specifications using the PGAU GENERATE statement.

---

**Note:** The Procedural Gateway Administrative Utility (PGAU) has been enhanced to automatically upgrade existing PG DD entries with a new attribute when a PGAU GENERATE command is executed. To support this enhancement, add a new privilege to the PGDDGEN role. To do this, as the PGAADMIN user, use SQL\*Plus to connect to the Oracle Integrating Server where the PG DD is stored. Then issue the following SQL command:

```
SQL> GRANT INSERT ON PGA_DATA_VALUES TO PGDDGEN
```

---

- a. Call PGAU in the directory path where the PGAU control files are generated and where TIPs are stored:

```
C:\> pgau
PGAU> CONNECT PGAADMIN\pgaadmin@database_specification_string
PGAU> GENERATE tranname
PGAU> EXIT
```

For more information about the `GENERATE` command, refer to the `PGAU GENERATE` command section in Chapter 2 of the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows*.

Note that it is not necessary to define the PG DD entries again.

5. Call `SQL*Plus` in the same directory path where the newly-generated TIP specifications are stored.

```
C:\> sqlplus tip_owner\pw@database_specification_string
SQL> @tipname.pkh
SQL> @tipname.pkb
SQL> exit
```

`PGAU GENERATE` produces the TIP in two output file, a specification and a body. You must compile both, first the specification and then the body.

For more information about the `GENERATE` command, refer to the `PGAU GENERATE` command section in Chapter 2 of the *Oracle Procedural Gateway for APPC User's Guide*.

## 9.7 Configuring the Gateway

To configure the gateway, perform the following steps:

1. Tailor the Oracle Procedural Gateway for APPC parameters.

Parameters specific to the gateway are supplied in the gateway parameter file, `initsid.ora`, which is in the `%ORACLE_HOME%\pg4appc\admin` directory. A sample gateway parameter file, `initPGA.ora`, is provided in this subdirectory.

---

---

**Note:** In the `initsid.ora` file, substitute your `pg4appc` SID name for "`sid`" in this file name.

The `initsid.ora` file contains both APPC and TCP/IP parameters, separated by a description. You must modify the `initsid.ora` file by deleting the TCP/IP parameters. Refer to [Appendix A, "Gateway Initialization Parameters for SNA Protocol"](#) for the valid APPC parameters.

---

---

The parameters fall into two categories:

- gateway initialization parameters

These parameters control the general operation of the gateway in the Oracle environment.

---

---

**Important:** Before performing the following step, refer to [Appendix A, "Gateway Initialization Parameters for SNA Protocol"](#) for information about tailoring gateway initialization and PGA parameters. Pay special attention to the information about using the `PGA_CAPABILITY` parameter.

---

---

- PGA parameters

PGA parameters control the APPC interface portion of the gateway. Use the `SET` gateway initialization parameter to specify PGA parameters. Oracle recommends that you group all `SET` commands for PGA parameters at the end of the `initsid.ora` file.

---

**Note:** Misspelled parameters are ignored. However, if the `%ORACLE_HOME%\pg4appc\admin\initsid.ora` file is missing, then all calls to the gateway fail and return a PGA-20928 error.

---

If you do not plan to configure commit-confirm, then proceed to "[Verifying the Gateway Installation and OLTP Configuration](#)" on page 9-13.

## 9.8 Configuring Commit-Confirm

---

**Note:** If you are planning to implement commit-confirm, then read the detailed explanation of commit-confirm capabilities in Chapter 5 of the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows*, "Implementing Commit-Confirm (SNA Only)" before proceeding.

---

Follow these steps to configure the commit-confirm components.

The steps for configuring commit-confirm include:

- configuring the Oracle Integrating Server where the gateway server will store its transaction log information
- configuring the gateway initialization parameters, and
- configuring the OLTP.

All these steps must be performed before attempting to use any application that uses commit-confirm.

### 9.8.1 Configuring the Oracle Integrating Server for Commit-Confirm

The Oracle Integrating Server where the gateway server will store its transaction log information should ideally be on the same system where the gateway runs. The configuration of the server consists of creating the gateway DBA user, creating the commit-confirm log tables and creating the PL/SQL stored procedure used by the gateway server for logging transactions.

The `pgaccou.sql` script from the `%ORACLE_HOME%\pg4appc\admin` directory creates the gateway DBA user ID. The default user ID is `PGADBA` with the initial password set to `PGADBA`. If you want to change the user ID or initial password, you must modify the script.

1. Use `SQL*Plus` to connect to the Oracle Integrating Server as user `SYSTEM`.
2. From `SQL*Plus`, run the `pgaccou.sql` script from the `%ORACLE_HOME%\pg4appc\admin` directory. This script creates the gateway DBA user ID. If you want to change the password at any time after running this script, then you can use the `ALTER USER` command to change the password. For further information, refer to the *Oracle Database SQL Reference*.

3. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGADBA.
4. From SQL\*Plus, run the pgaccpnd.sql script from the %ORACLE\_HOME%\pg4appc\admin directory. This script creates the PGA\_CC\_PENDING table used by the gateway server for its commit-confirm transaction log.
5. From SQL\*Plus, run the pgacclog.sql script from the %ORACLE\_HOME%\pg4appc\admin directory. This script creates the PGA\_CC\_LOG PL/SQL stored procedure used by the gateway server for updating the PGA\_CC\_PENDING table.
6. Disconnect from the Oracle Integrating Server.

## 9.8.2 Configuring Gateway Initialization Parameters for Commit-Confirm

The gateway initialization parameters are described in [Appendix A, "Gateway Initialization Parameters for SNA Protocol"](#). The parameters necessary for commit-confirm support in the gateway are:

- PGA\_CAPABILITY
- PGA\_LOG\_DB
- PGA\_LOG\_USER
- PGA\_LOG\_PASS
- PGA\_RECOVERY\_USER
- PGA\_RECOVERY\_PASS
- PGA\_RECOVERY\_TPNAME

These parameters should be added to your initsid.ora file, where *sid* is the gateway SID for the commit-confirm gateway.

Refer to [Appendix A, "Gateway Initialization Parameters for SNA Protocol"](#) for full information about the gateway initialization parameters supported by the Oracle Procedural Gateway for APPC.

## 9.8.3 Configuring the OLTP for Commit-Confirm

Configuration of the OLTP includes the following:

- defining and installing the commit-confirm transaction log database
- defining and installing the commit-confirm forget/recovery transaction
- defining and installing the sample commit-confirm applications provided with the gateway.

---

---

**Note:** A restart of the OLTP may be necessary to implement the changes required for commit-confirm support. You should plan for this with your OLTP system administrator.

---

---

Detailed instructions for configuring the Transaction Server for z/OS and IMS/TM are provided in the %ORACLE\_HOME%\pg4appc\demo\CICS\README.doc and %ORACLE\_HOME%\pg4appc\demo\IMS\README.doc files, respectively.



Refer to "Implementing Commit-Confirm (SNA Only)" in the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* for detailed information about commit-confirm.

- You will take steps to verify configuration of commit-confirm later in this chapter, in [Section 9.9.3, "Verifying OLTP Configuration for Commit-Confirm"](#) on page 9-16.

However, first proceed to [Section 9.9](#) to verify the gateway installation.

## 9.9 Verifying the Gateway Installation and OLTP Configuration

To verify the gateway installation and the OLTP configuration, perform the following procedures after installing Oracle Procedural Gateway for APPC. In addition, if you chose to configure commit-confirm, then follow the steps to verify the OLTP configuration for commit-confirm.

---



---

**Note:** If your database link name is not PGA, then modify the demonstration .sql files to give them the particular database link name that you created in Step 5 of "[Integrating Server Configuration: First-Time Gateway Installations](#)" on page 9-3. You must modify the following .sql files:

- pgavsn.sql
  - pgaecho.sql
  - pgacics.sql
  - pgaidms.sql
  - pgaims.sql
  - pgamvs.sql
- 
- 

### 9.9.1 Verifying the Gateway Installation

To verify the gateway software installation using the database link PGA previously created, perform the following steps:

1. Using SQL\*Plus, connect to the Oracle Integrating Server as user PGAADMIN.
2. Run %ORACLE\_HOME%\pg4appc\demo\pgavsn.sql.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo
SQL> @pgavsn.sql
```

The server version number banner appears at your terminal. You will receive the following output:

```
Oracle Procedural Gateway for APPC.
Version 10.2.0.1.0 Fri Jun 3 13:12:49 2005
```

```
Copyright (c) Oracle Corporation 1979,
2005. All rights reserved.
```

```
PL/SQL procedure successfully completed.
```

3. Run %ORACLE\_HOME%\pg4appc\demo\pgaecho.sql.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo
SQL> @pgaecho.sql
```

You will receive the following output:

```
==> Congratulations, your installation was successful. <==
```

## 9.9.2 Verifying the OLTP Configuration

The procedure for verifying the OLTP configuration varies, depending on which OLTP you are using and depending on the platform the OLTP is running on. CICS Transaction Server for z/OS, IMS/TM, APPC/MVS, IDMS-DC and z/OS are the currently supported OLTPs. Follow the instructions for verifying the installation.

---

---

**Attention:** If you have not completed the file transfers detailed in ["Preparing to Configure a Gateway Installation/Upgrade"](#) on page 9-2, then complete them now, before proceeding to the next step.

---

---

### 9.9.2.1 CICS Verification

If your OLTP is CICS Transaction Server for z/OS, then perform the following steps to verify the CICS configuration.

1. To verify that the FLIP transaction is installed correctly, log on to your CICS Transaction Server for z/OS and enter the following transaction, replacing FLIP with the transaction ID you chose for FLIP when you configured your CICS Transaction Server for z/OS for the gateway:

```
FLIP THIS MESSAGE
```

The following output appears at your terminal:

```
EGASSEM SIHT PILF
```

2. From the Windows platform, modify the `pgacics.sql` file which resides at `%ORACLE_HOME%\pg4appc\demo\CICS\pgacics.sql`.

Customize the following three items used for accessing the gateway and the CICS Transaction Server for z/OS, as described in the comments at the beginning of the file:

- the CICS transaction ID
  - the side profile name
  - the logmode entry name
3. Ensure that the SNA Server on the system has been started.
  4. Log on to the CICS Transaction Server for z/OS and enter this transaction, where *name* is the name of the CONNECTION definition installed by the DFHCSDUP job you ran in the CICS configuration steps:

```
CEMT SET CONNECTION(name) ACQUIRED
```

This transaction activates the CICS connection to Windows.

5. Use SQL\*Plus to connect to the Oracle Integrating Server as PGAADMIN.
6. Run `pgacics.sql`.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo\CICS
SQL> @pgacics.sql
```

The following message appears:

```
==> Congratulations, your gateway is communicating with CICS <==
```

The CICS Transaction Server for z/OS installation verification is complete.

### 9.9.2.2 IDMS-DC Verification

If the OLTP is IDMS-DC, then perform the following steps to verify the IDMS-DC configuration:

1. From the Microsoft Windows platform, modify the `pgaidms.sql` file, which resides at `%ORACLE_HOME%\pg4appc\demo\IDMS\pgaidms.sql`. Customize the following three items used for accessing the gateway and the IDMS-DC system, as described in the comments at the beginning of the file:
  - the IDMS-DC transaction ID
  - the side profile name
  - the logmode entry name
2. Ensure that the SNA Server on your system has been started.
3. Using the IDMS-DC DCMT transaction, display the LU6.2 line to check that sessions have been started with your system. Enter the following command, where `linename` is the name of the LINE defined for LU6.2 communications with your system:

```
DCMT DIS LINE linename
```

Each defined L-TERM/P-TERM should show a status of INSRV. Any other status indicates a problem with the IDMS-DC APPC interface.

4. Use SQL\*Plus to connect to the Oracle Integrating Server as PGAADMIN.
5. Run `pgaidms.sql`.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo\IDMS
SQL> @$pgaidms.sql
```

The following message appears:

```
==> Congratulations, your gateway is communicating with IDMS-DC<==
```

The IDMS-DC installation verification is now complete.

### 9.9.2.3 IMS/TM Verification

If the OLTP is IMS/TM, then perform the following steps to verify the IMS/TM configuration:

1. To verify that the FLIP transaction is installed correctly, log on to the IMS/TM system and enter the following transaction, replacing `FLIP` with the transaction ID you chose for `FLIP` when you configured the IMS/TM system for the gateway:

```
FLIP THIS MESSAGE
```

The following output appears on the terminal:

```
EGASSEM SIHT PILF
```

2. From a Windows platform, modify the `pgaims.sql` file, which resides at

%ORACLE\_HOME%\pg4appc\demo\IMS\pgaims.sql. Customize the following three items used for accessing the gateway and the IMS/TM system, as described in the comments at the beginning of the file:

- the IMS/TM transaction ID
  - the side profile name
  - the logmode entry name
3. Ensure that the SNA Server on the system has been started.
  4. Use SQL\*Plus to connect to the Oracle Integrating Server as PGAADMIN.
  5. Run pgaims.sql.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo\IMS
SQL> @pgaims.sql
```

The following message appears:

```
==> Congratulations, your gateway is communicating with IMS/TM <==
```

The IMS/TM installation verification is now complete.

#### 9.9.2.4 APPC/MVS Verification

If the OLTP is APPC/MVS, then perform the following steps to verify the APPC/MVS configuration:

1. Verify that the APPC/MVS subsystem is active.
2. From the Windows platform, modify the pgamvs.sql file, which resides at %ORACLE\_HOME%\pg4appc\demo\MVS\pgamvs.sql. Customize the following three items used for accessing the gateway and the APPC/MVS system, as described in the comments at the beginning of the file:
  - the APPC/MVS transaction ID
  - the side profile name
  - the logmode entry name
3. Ensure that the SNA Server on the system has been started.
4. Use SQL\*Plus to connect to the Oracle Integrating Server as PGAADMIN.
5. Run pgamvs.sql.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo\MVS
SQL> @pgamvs.sql
```

The following message appears:

```
=> Congratulations, your gateway is communicating with APPC/MVS <=
```

The APPC/MVS installation verification is now complete.

### 9.9.3 Verifying OLTP Configuration for Commit-Confirm

If you chose to configure commit-confirm in [Section 9.8, "Configuring Commit-Confirm"](#), then the following section will assist you in verifying the configuration.

---



---

**Note:** Refer to Chapter 5, "Implementing Commit-Confirm" in the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* for background information about the components and capabilities of commit-confirm.

---



---

Samples are provided with the gateway for Transaction Server for z/OS and IMS/TM for implementing commit-confirm support. They are in the following directories, respectively: %ORACLE\_HOME%\pg4appc\demo\CICS and %ORACLE\_HOME%\pg4appc\demo\IMS. A README.doc file in each directory provides detailed information about installing and using the samples. JCL files for compiling and linking the sample programs are provided as well. The samples included with the gateway assist you with the following:

- Creating and initializing the commit-confirm transaction log databases and defining those databases to the OLTP. For Transaction Server for z/OS, the sample uses a VSAM file for the log database. For IMS/TM, a SHISAM/VSAM database is used.
- Using subroutines for receiving the Oracle Global Transaction ID from the gateway and logging it into the commit-confirm transaction log database. These subroutines are provided in the pgacclg.asm files. They can be used in the applications to reduce the complexity of the code changes to the programs.

For Transaction Server for z/OS, the subroutine provided is called using the EXEC CICS LINK interface. For IMS/TM, the subroutine provided is called using the standard CALL statement or its equivalent in the application's programming language. Both these subroutines are written in 370 assembler to eliminate any interlanguage interface complexities and compiler dependencies.

- Installing forget/recovery transactions in the OLTP. These are provided in the ppareco.asm files. Forget/recovery transactions must be accessible through APPC so that the gateway can call them to forget a transaction once it has been successfully committed, and to query a transaction's state during recovery processing. These transactions delete the entry for a particular Oracle Global Transaction ID from the OLTP commit-confirm transaction log database during forget processing, and query the entry for a particular Oracle Global Transaction ID from the OLTP commit-confirm transaction log database during recovery processing. For both Transaction Server for z/OS and IMS/TM, these transactions are written in 370 assembler.
- Using the sample commit-confirm transaction log databases and subroutines. For Transaction Server for z/OS, a sample DB2 update transaction, DB2C, is provided in the pgadb2c.cob file. This is a COBOL example that updates the DB2 sample EMP table. For IMS/TM, a sample DLI update transaction, PGAIMSU, is provided in the pgaimsu.cob file. This is a COBOL example that updates the DLI sample PARTS database.

## 9.10 Performing Postinstallation Procedures

The following are optional steps that you can perform as necessary. Installation of the sample applications for your OLTP is recommended to help you to fully understand how the gateway works and how it interfaces with the OLTP.

## 9.10.1 Installing Sample Applications

The Oracle Procedural Gateway for APPC package contains sample PL/SQL procedures and OLTP transaction programs that demonstrate the capabilities of the gateway. Samples are provided for the following:

### APPC/MVS

- z/OS dataset information

### CICS Transaction Server for z/OS

- ADABAS inquiry
- DB2 inquiry
- DB2 multirow inquiry
- DB2 update
- VSAM inquiry
- VSAM update
- DLI inquiry
- FEPI DB2 inquiry
- FEPI VSAM inquiry
- IDMS-DC
- IDMS/R inquiry

### IMS/TM

- IMS inquiry using IVTNO and IVTNV sample transactions
- IMS PARTS inquiry (CPI-C)
- IMS PARTS update (CPI-C)

Additional samples are added to the distribution media in later releases of the product. Wherever possible, the sample applications use the sample databases provided with the database products.

For this release, full documentation on installing and using the sample applications is available in the README.doc files in the following directories:

- %ORACLE\_HOME%\pg4appc\demo
- %ORACLE\_HOME%\pg4appc\CICS
- %ORACLE\_HOME%\pg4appc\IMS
- %ORACLE\_HOME%\pg4appc\MVS
- %ORACLE\_HOME%\pg4appc\IDMS

---

---

# Gateway Configuration Using TCP/IP Communication Protocol

This chapter outlines the steps needed to configure the Oracle Integrating Server for a gateway using TCP/IP for IMS Connect on your Microsoft Windows platform. It also provides the steps necessary to verify installation and configuration of the gateway and OLTP components. It contains the following sections:

- [Before You Begin](#)
- [Preparing to Configure a Gateway Installation/Upgrade](#)
- [Configuring the Oracle Integrating Server: First Time Installation](#)
- [Upgrading or Migrating the Oracle Server from Previous Gateways](#)
- [Optional Configuration Steps to Permit Multiple Users](#)
- [Configuring TCP/IP for the Gateway](#)
- [Configuring the Gateway](#)
- [Loading the PGA\\_TCP\\_IMSC Table](#)
- [Verifying the Gateway Installation and OLTP Configuration](#)
- [Performing Postinstallation Procedures](#)

Configuring the Oracle Procedural Gateway for APPC using TCP/IP support for IMS Connect involves working with the following components:

- the Oracle Integrating Server
- your Windows system
- your network
- the OLTP

## 10.1 Before You Begin

This chapter requires you to input parameters unique to your system in order to properly configure the gateway and TCP/IP communications interface.

Refer to [Appendix E, "Configuration Worksheet"](#) for a worksheet listing the installation parameters you will need to know before you can complete the configuration process. Ask your network administrator to provide you with these unique parameter names before you begin.

## 10.2 Preparing to Configure a Gateway Installation/Upgrade

There are three ways to establish the gateway-Oracle Integrating Server relationship when you are installing or upgrading/migrating the gateway:

- When the Oracle Integrating Server and the gateway are installed in the same ORACLE\_HOME on the same machine;
- When the Oracle Integrating Server and the gateway are installed on separate machine; or
- When the Oracle Integrating Server and the gateway are on the same machine but in different directories

Depending on the location of your gateway and your Oracle Integrating Server, you may need to transfer some of the gateway administrative files to the location where the Oracle Integrating Server is installed.

Follow the instructions suitable to your combination of the gateway-Oracle Integrating Server locations listed below.

### When the Oracle Integrating Server and the gateway are installed in the same ORACLE\_HOME on the same machine

You do not need to transfer files. Proceed to "[Configuring the Oracle Integrating Server: First Time Installation](#)" on page 10-3.

### When the Oracle Integrating Server and the gateway are installed on separate machine

1. Locate the gateway administrative files in the gateway %ORACLE\_HOME%\pg4appc\admin directory. All files in this directory that have the suffix .sql, .pkl, and .pkb must be copied into a similarly-named directory in the Oracle Integrating Server's Oracle home directory.
2. Now locate the gateway demo files and subdirectories in the gateway %ORACLE\_HOME%\pg4appc\demo directory. Copy the pgavsn.sql and pgaecho.sql files into a similarly named directory in the Oracle Integrating Server.
3. Copy the pgaims.sql file from the gateway Oracle home %ORACLE\_HOME%\pg4appc\demo\IMS directory to your Oracle Integrating Server's Oracle home %ORACLE\_HOME%\pg4appc\demo\IMS directory.
4. Optional Steps: If you want to run IVTNV and IVTNO, then you will need to copy the ivtnoctl, ivtnod.sql, ivtnvctl, and ivtnvd.sql files into the Oracle Integrating Server's Oracle home %ORACLE\_HOME%\pg4appc\demo\IMS directory as well. Make sure to generate the required TIPs and transfer them as well.

### When the Oracle Integrating Server and the gateway are on the same machine but in different directories

You must change your gateway's Oracle home to the Oracle Integrating Server's Oracle home directory.

1. For example, if your gateway's Oracle home is set as follows:

```
C:\> echo %ORACLE_HOME%
C:\oracle\pga\10.2
```

and your server's Oracle home is located in the '\oracle\pga\10.2' directory, then you need to do the following:

```
C:\> SET ORACLE_HOME=C:\oracle\pga\10.2
```



2. Now, create the directories with the following commands:

```
C:\> cd %ORACLE_HOME%
C:\> mkdir pg4appc
C:\> mkdir pg4appc\admin
C:\> mkdir pg4appc\demo
C:\> mkdir pg4appc\demo\IMS
```

3. Use whatever file transfer mechanism is available on your system to copy all the .sql, .pkh, and .pkb files from the gateway's Oracle home %ORACLE\_HOME%\pg4appc\admin directory to the Oracle Integrating Server's Oracle home %ORACLE\_HOME%\pg4appc\admin directory.
4. You may also transfer the demo files from the gateway directory to the Oracle Integrating Server directory. Copy the pgavsn.sql and pgaecho.sql files and directory recursively from the gateway Oracle home's %ORACLE\_HOME%\pg4appc\demo directory to the Oracle Integrating Server's %ORACLE\_HOME%\pg4appc\demo directory.
5. You may also copy the pgaims.sql file from the gateway Oracle home %ORACLE\_HOME%\pg4appc\demo\IMS directory to the Oracle Integrating Server Oracle home %ORACLE\_HOME%\pg4appc\demo\IMS directory.

Optional Steps: If you want to run IVTNV and IVTNO, then you will need to copy the ivtno.ctl, ivtnod.sql, ivtnv.ctl, and ivtnvd.sql files into the Oracle Integrating Server's Oracle home %ORACLE\_HOME%\pg4appc\demo\IMS directory as well. Make sure to generate the required TIPs and transfer them as well.

Proceed to ["Configuring the Oracle Integrating Server: First Time Installation"](#) on page 10-3. Following those steps, you may want to perform the [Optional Configuration Steps to Permit Multiple Users](#), on page 10-8.

## 10.3 Configuring the Oracle Integrating Server: First Time Installation

Follow these steps to configure the Oracle Integrating Server after installing the Oracle Procedural Gateway for APPC.

1. Ensure that the UTL\_RAW PL/SQL package has been installed on the Oracle Integrating Server. All PGAU-generated TIP specifications use UTL\_RAW, which provides routines for manipulating raw data.

- a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
- b. From SQL\*Plus, enter the following command:

```
SQL> DESCRIBE UTL_RAW
```

The DESCRIBE statement produces output on the screen. If you browse through the output, then you should see some functions, including a compare function. If you do not see this output, then continue the UTL\_RAW installation by performing Step d.

If the DESCRIBE statement indicates success, then your Oracle Integrating Server has UTL\_RAW installed and you can proceed to Step 2.

- c. Use SQL\*Plus to connect to the Oracle Integrating Server as SYS.
- d. From SQL\*Plus, run the utlraw.sql and prvtrawb.plb scripts in the Oracle Integrating Server %ORACLE\_HOME%\rdbms\admin directory, in the following order:

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @utlraw.sql
SQL> @prvtrawb.sql
```

2. Ensure that the DBMS\_OUTPUT standard PL/SQL package is enabled on your Oracle Integrating Server. The sample programs and installation verification programs on the distribution media use this standard package.
  - a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. Enter the following command:

```
SQL> DESCRIBE DBMS_OUTPUT
```

The DESCRIBE statement produces output on your screen. If you browse through that output, then you should see some functions, including a put\_line function.

If you do not see this output, then you must create the DBMS\_OUTPUT package. Refer to the *Oracle Database Application Developer's Guide* for more information about creating the DBMS\_OUTPUT package. After successful installation of the DBMS\_OUTPUT package, issue the DESCRIBE statement.

If the DESCRIBE statement indicates success, then your Oracle Integrating Server has DBMS\_OUTPUT created, and you can proceed to Step 3.

3. Install the UTL\_PG PL/SQL package. All PGAU-generated TIP specifications use UTL\_PG, which provides routines for performing numeric conversions to and from raw data.
  - a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. From SQL\*Plus, run the utlpg.sql and prvtpgb.plb scripts in the Oracle Integrating Server's %ORACLE\_HOME%\rdbms\admin directory, in the following order:

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @utlpg.sql
SQL> @prvtpgb.plb
```

4. Install the Heterogeneous Services (HS) catalogs.
  - a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. Enter the following command:

```
SQL> DESCRIBE HS_FDS_CLASS
```

The DESCRIBE statement produces output on the screen. If the DESCRIBE statement indicates success, then Heterogeneous Services catalogs have been created on your Oracle Integrating Server and you can proceed to Step 5.

If the DESCRIBE statement does not indicate success, then you must create Heterogeneous Services catalogs and you must perform Step c below:

- c. If it is necessary to create the Heterogeneous Services catalog, then enter the following command:

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @cath.s.sql
```

5. Create a public database link to access the Oracle Procedural Gateway for APPC:

Use SQL\*Plus to connect to the Oracle Integrating Server as user SYSTEM. You can use the following SQL\*Plus sample whether the Oracle Integrating Server and the gateway are on the same system or on different systems. In the following sample, `pgasrv` is the `tns_name_entry` that will be assigned to the gateway when you modify the `tnsnames.ora` file later in this chapter.

```
SQL> CREATE PUBLIC DATABASE LINK PGA USING 'PGASRV'
```

6. Create the gateway administrator user PGAADMIN and install the PG DD.

a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYSTEM.

b. From SQL\*Plus, run the `pgacr8au.sql` script in the `%ORACLE_HOME%\pg4appc\admin` directory. This script creates the PGAADMIN user ID.

The initial password defined for PGAADMIN is PGAADMIN. Use the `ALTER USER` command to change the password. For further information about password issues, refer to the *Oracle Database SQL Reference*.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgacr8au.sql
```

c. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.

d. From SQL\*Plus, run the `pgddcr8.sql` script in the `%ORACLE_HOME%\pg4appc\admin` directory. This script installs the PG DD.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddcr8.sql
```

e. From SQL\*Plus, connect to the Oracle Integrating Server as user SYS.

f. Grant execution privileges on DBMS\_PIPE to PGAADMIN:

```
SQL> GRANT EXECUTE ON DBMS_PIPE TO PGAADMIN
```

7. Ensure that the `pg4tcpmap` package has been installed on your Oracle Integrating Server. Follow Steps a through c to test for proper installation of `pg4tcpmap`.

Refer to "Output for the `pg4tcpmap` Tool" in [Appendix B](#) for a sample of the output from the `pg4tcpmap` tool, and refer to Chapter 6 of the *Oracle Procedural Gateway for APPC User's Guide* for details about the commands needed to run the tool.

a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYSTEM.

b. Enter the following command:

```
SQL> select table_name, owner
from dba_tables
where table_name = 'PGA_TCP_IMSC',
and owner = 'PGAADMIN';
SQL> column owner format a 10
SQL> column index_name format a 18
SQL> column table_name format a 14
SQL> select owner, index_name, table_name, uniqueness
from dba_indexes
where index_name = 'PGA_TCP_IMSC_IND';
```

Both SELECT statements must produce one row each. Following is the result for the first select statement:

TABLE_NAME	OWNER
PGA_TCP_IMSC	PGAADMIN

Following is the result of the second select statement:

OWNER	INDEX_NAME	TABLE_NAME	UNIQUENESS
PGAADMIN	PGA_TCP_IMSC_IND	PGA_TCP_IMSC	UNIQUE

If the select statements produce the preceding output on the screen, then you can skip Step C. If the select statement produces no output or more than one row, then the result is not the same as the output described above, and it is necessary for you to perform Step c.

- c. From SQL\*Plus, run the pgaimsc.sql script in the Oracle Integrating Server's %ORACLE\_HOME%\pg4appc\admin directory:

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgaimsc.sql
```

- 8. Install the TIP trace access PL/SQL routines. These routines require that the DBMS\_PIPE standard PL/SQL package is installed and that PGAADMIN has execute privileges on it. For more information about DBMS\_PIPE, refer to the *Oracle Database Application Developer's Guide*.

- a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.

- b. From SQL\*Plus, run the pgatiptr.sql script in the %ORACLE\_HOME%\pg4appc\admin directory. This script creates PL/SQL routines that can be called to read and purge trace information created by PGAU-generated TIP specifications. It also creates public synonyms for these routines. The script prompts you for the necessary user IDs and passwords.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgatiptr.sql
```

- 9. Install the GPGLOCAL package. This package is required for compilation and execution of all PGAU-generated TIP specifications. TIP developers should be granted execute privileges on GPGLOCAL (refer to ["Optional Configuration Steps to Permit Multiple Users"](#) on page 10-8).

- a. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.

- b. From SQL\*Plus, run the gpglocal.pkh script in the %ORACLE\_HOME%\pg4appc\admin directory. This script compiles the GPGLOCAL package specification.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @gpglocal.pkh
```

- c. From SQL\*Plus, run the gpglocal.pkb script in the %ORACLE\_HOME%\pg4appc\admin directory. This script compiles the GPGLOCAL package body.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @gpglocal.pkb
```

---



---

**Note: Recompile TIPs when changing communication protocol from SNA to TCP/IP:**

If you have existing TIPs that were generated previously on a gateway using the SNA protocol and you want to use the new TCP/IP feature, then the TIPs will have to be regenerated by PGAU with mandatory NLS\_LANGUAGE and Side Profile Settings. Specify the suitable ASCII character set in the DEFINE TRANSACTION command.

This is due to the fact that the gateway assumes that the appropriate user exit in IMS Connect is being used, which would translate between the suitable ASCII and EBCDIC character sets.

---



---

## 10.4 Upgrading or Migrating the Oracle Server from Previous Gateways

Follow these instructions only if you have a previous version of the Oracle Procedural Gateway for APPC installed on your system and need to configure it for release 10.2.0.1.0 of the gateway.

1. Upgrade your Oracle Procedural Gateway for APPC to current version levels as follows:

- a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
- b. Install the UTL\_RAW package body. From SQL\*Plus, run the prvtrawb.plb script from the %ORACLE\_HOME%\rdbms\admin directory. This script upgrades the UTL\_RAW package body.

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @prvtrawb.plb
```

- c. Install the UTL\_PG package body. From SQL\*Plus, run the prvtpgb.plb script from the %ORACLE\_HOME%\rdbms\admin directory. This script upgrades the UTL\_PG package body.

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @prvtpgb.plb
```

The prvtrawb.plb and prvtpgb.plb scripts should complete successfully. If they fail because specifications do not exist or were invalidated, then consider reinstalling the package specifications as directed in [Section 10.4.1, "If You Must Reinstall Package Specifications"](#).

### 10.4.1 If You Must Reinstall Package Specifications

If the UTL\_RAW or UTL\_PG package has been invalidated or removed, then the prvtrawb.plb and prvtpgb.plb scripts may not complete successfully, then, you might have to reinstall the package specifications.

If you do reinstall the package specifications, then any dependent objects (such as existing user TIPs and client applications) are invalidated and will subsequently need to be recompiled. The impact of this is a one-time performance delay while recompilation of the TIPs and dependent client applications proceeds.

---

---

**Note:** Before proceeding with reinstallation of the package scripts, make sure that you are in the %ORACLE\_HOME%\pg4appc\admin directory

---

---

TIPs were split into separate specification and body files in release 3.3 to avoid cascaded recompilations in later releases.

- Step 1: Run the following scripts before proceeding with the PGAU upgrade:
  - a. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user SYS.
  - b. From SQL\*Plus, run the utlraw.sql and utlpg.sql scripts in the Oracle Integrating Server %ORACLE\_HOME%\rdbms\admin directory, in the following order, to upgrade their respective package specifications:

```
C:\> cd %ORACLE_HOME%\rdbms\admin
SQL> @utlraw.sql
SQL> @utlpg.sql
```

- Step 2: Repeat installation of UTL\_RAW and UTL\_PG package body

After the scripts have run, repeat Steps 1a and 1b in [Section 10.4, "Upgrading or Migrating the Oracle Server from Previous Gateways"](#) and then, proceed to [Section 10.4.2, "Upgrading PGAU from Previous Gateway Releases"](#).

---

---

**Note:** TIPs and dependent client applications must be recompiled after reinstallation of the package specifications. Refer to *Oracle Procedural Gateway for APPC User's Guide* for more information about compiling TIPs

---

---

## 10.4.2 Upgrading PGAU from Previous Gateway Releases

Upgrade the PG DD as follows before execution the new PGAU:

1. If necessary, then use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.
2. From SQL\*Plus, run the pgddupgr.sql script in the %ORACLE\_HOME%\pg4appc\admin directory. This script upgrades the PG DD.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddupgr.sql
```

## 10.5 Optional Configuration Steps to Permit Multiple Users

The following configuration steps are optional. Perform these steps if you want to allow users other than PGAADMIN to perform PG DD operations using PGAU.

1. Create public synonyms for the PG DD to allow other users to access the tables:
  - a. Use SQL\*Plus to connect to the Oracle Integrating Server as user SYSTEM.
  - b. From SQL\*Plus, run the pgddcr8s.sql script in the %ORACLE\_HOME%\pg4appc\admin directory. This script creates public synonyms for the PG DD.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
```

```
SQL> @pgddcr8.sql
```

2. Create roles for accessing the PG DD, performing definitions of transactions, and generating TIP specifications. The PGAADMIN user can grant these roles to other users as necessary.
  - a. Use SQL\*Plus to connect to the Oracle Integrating Server as user PGAADMIN.
  - b. From SQL\*Plus, run the pgddcr8r.sql script in the %ORACLE\_HOME%\pg4appc\admin directory. This script creates two roles, PGDDDEF and PGDDGEN. The PGDDDEF role provides SELECT, INSERT, UPDATE, and DELETE privileges against some of the PG DD tables, and select privileges against others, and allows execution of the PGAU DEFINE, GENERATE, REDEFINE, REPORT, and UNDEFINE statements. The PGDDGEN role provides select privileges against the PG DD tables, and allows execution of the PGAU GENERATE and REPORT statements only.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddcr8r.sql
```

3. Grant access to PGA required packages.

TIP developers require access to the following PL/SQL packages, which are shipped with the Oracle Integrating Server:

- DBMS\_PIPE in the %ORACLE\_HOME%\rdbms\admin directory
- UTL\_RAW in the %ORACLE\_HOME%\rdbms\admin directory
- UTL\_PG in the %ORACLE\_HOME%\rdbms\admin directory

Explicit grants to execute these packages must be made to TIP developers.

These grants can be private, as in the following example:

```
C:\> sqlplus SYS\pw@database_specification_string
SQL> GRANT EXECUTE ON UTL_RAW TO tip_developer;
SQL> GRANT EXECUTE ON UTL_PG TO tip_developer;
SQL> GRANT EXECUTE ON DBMS_PIPE TO tip_developer;
SQL> CONNECT PGAADMIN\pw@database_specification_string
SQL> GRANT EXECUTE ON PGAADMIN.PURGE_TRACE TO tip_developer;
SQL> GRANT EXECUTE ON PGAADMIN.READ_TRACE TO tip_developer;
SQL> GRANT EXECUTE ON PGAADMIN.GPGLOCAL TO tip_developer;
SQL> exit
```

Alternatively, these grants can be public, as in the following example:

```
C:\> sqlplus SYS\pw@database_specification_string
SQL> GRANT EXECUTE ON UTL_RAW TO PUBLIC;
SQL> GRANT EXECUTE ON UTL_PG TO PUBLIC;
SQL> GRANT EXECUTE ON DBMS_PIPE TO PUBLIC;
SQL> CONNECT PGAADMIN\pw@database_specification_string
SQL> GRANT EXECUTE ON PGAADMIN.PURGE_TRACE TO PUBLIC;
SQL> GRANT EXECUTE ON PGAADMIN.READ_TRACE TO PUBLIC;
SQL> GRANT EXECUTE ON PGAADMIN.GPGLOCAL TO PUBLIC;
SQL> EXIT
```

You can use either private or public grants. Both are sufficient for using PGA. Public grants are easier and can be performed now. If you use private grants, then they must be issued each time a new TIP developer user ID is created.

SQL scripts for performing these grants are provided in the %ORACLE\_HOME%\pg4appc\admin directory. The pgddapub.sql script

performs these grants for public access to the packages. The `pgddadev.sql` script performs the grants for private access to the packages by a single TIP developer. If you are going to use private grants, then you must run the `pgddadev.sql` script once for each TIP developer's user ID:

- a. Use SQL\*Plus to connect to the Oracle Integrating Server as user `PGAADMIN`.
- b. From SQL\*Plus, run the suitable script (`pgddapub.sql` or `pgddadev.sql`) from the `%ORACLE_HOME%\pg4appc\admin` directory. The script performs the necessary grants as described earlier. You are prompted for the required user IDs, passwords, and database specification strings. If you are using private grants, then repeat this step for each user ID requiring access to the packages.

```
C:\> cd %ORACLE_HOME%\pg4appc\admin
SQL> @pgddapub.sql
```

or

```
SQL> @pgddadev.sql
```

4. If you are upgrading from a previous release of the gateway when the communication protocol was SNA, to the current gateway using TCP/IP, and if you want to upgrade your existing TIPs with new function and maintenance, then regenerate existing TIP specifications using the `PGAU GENERATE` statement.

---

**Note:** The Procedural Gateway Administrative Utility (PGAU) has been enhanced to automatically upgrade existing PG DD entries with a new attribute when a `PGAU GENERATE` command is executed. To support this enhancement, add a new privilege to the `PGDDGEN` role. To do this, as the `PGAADMIN` user, use SQL\*Plus to connect to the Oracle Integrating Server where the PG DD is stored. Then, issue the following SQL command:

```
SQL> GRANT INSERT ON PGA_DATA_VALUES TO PGDDGEN
```

---

- a. Call `PGAU` in the directory path where the `PGAU` control files are generated and where TIPs are stored:

```
C:\> pgau
PGAU> CONNECT PGAADMIN\pgaadmin@database_specification_string
PGAU> GENERATE tranname
PGAU> EXIT
```

For more information about the `GENERATE` command, refer to the `PGAU GENERATE` command section in Chapter 2 of the *Oracle Procedural Gateway for APPC User's Guide*.

Note that it is not necessary to define the PG DD entries again.

5. Call SQL\*Plus in the same directory path where the newly-generated TIP specifications are stored.

```
C:\> sqlplus tip_owner\pw@database_specification_string
SQL> @tipname.pkh
SQL> @tipname.pkb
SQL> exit
```

`PGAU GENERATE` produces the TIP in two output files, a specification and a body. You must compile both, first the specification and then the body.



For more information about the `GENERATE` command, refer to the `PGAU GENERATE` command section in Chapter 2 of the *Oracle Procedural Gateway for APPC User's Guide*.

## 10.6 Configuring TCP/IP for the Gateway

You must now configure the TCP/IP for IMS Connect communication package profiles for TCP/IP connections.

Configure the profiles to define the TCP/IP conversations with the OLTP. Refer to [Chapter 7, "Configuring the TCP/IP Communications Package for IMS Connect"](#) for the suitable instructions.

When you have finished configuring your communications package, return to the following section, [Section 10.7, "Configuring the Gateway"](#) on page 10-11.

## 10.7 Configuring the Gateway

To configure the gateway, follow the instructions given subsequently:

1. Tailor the gateway parameters.

There are a number of parameters specific to the Oracle Procedural Gateway for APPC when it is using TCP/IP for IMS Connect. These are supplied in the gateway parameter file, `initsid.ora`, which is in the `%ORACLE_HOME%\pg4appc\admin` directory. A sample gateway parameter file, `initPGA.ora`, is provided in this subdirectory.

---

**Note:** In the `initsid.ora` file, substitute your gateway SID name for `"sid"` in this file name.

The `initsid.ora` file contains both APPC and TCP/IP parameters, separated by a description. You must modify the `initsid.ora` file by deleting the APPC parameters. Refer to [Appendix B, "Gateway Initialization Parameters for TCP/IP Communication Protocol"](#) for the valid TCP/IP parameters.

---

The parameters fall into two categories:

- gateway initialization parameters

These parameters control the general operation of the gateway in the Oracle environment.

---

**Important:** Before performing the following step, refer to [Appendix B, "Gateway Initialization Parameters for TCP/IP Communication Protocol"](#) for information about tailoring gateway initialization and PGA parameters. Pay special attention to the information about using the `PGA_CAPABILITY` parameter.

---

- PGA parameters

PGA parameters control the TCP/IP interface portion of the gateway. Use the `SET` gateway initialization parameter to specify PGA parameters. Oracle recommends that you group all `SET` commands for PGA parameters at the end of the `initsid.ora` file.

---

---

**Note:** Misspelled parameters are ignored. However, if the %ORACLE\_HOME%\pg4appc\admin\initsid.ora file is missing, then all calls to the gateway fail and return a PGA-20928 error.

---

---

## 10.8 Loading the PGA\_TCP\_IMSC Table

Gateway users who wish to employ the TCP/IP protocol do so by using the pg4tcpmap tool.

The pg4tcpmap tool resides on the gateway. Its function is to map the side profile name to TCP/IP and IMS Connect attributes. You must run this tool before executing the PL/SQL gateway statements (such as %ORACLE\_HOME%\pg4appc\demo\IMS\pgaims.sql).

In PGAINIT TIP, for example, the user must specify a side profile name. The SNA protocol recognizes and uses the parameter. In this release of the gateway, the pg4tcpmap tool uses the original PGAINIT TIP format to map the relevant SNA parameters to TCP/IP. The pg4tcpmap tool inserts the values of these parameters into a table called PGA\_TCP\_IMSC.

Before executing pg4tcpmap, you must specify the *ORACLE\_HOME*, Oracle SID and modify *initsid.ora*. Refer to [Appendix B, "Gateway Initialization Parameters for TCP/IP Communication Protocol"](#) in this guide and Chapter 6 in the Oracle Procedural Gateway for APPC User's Guide for complete information about the pg4tcpmap commands.

Chapter 6 of the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* contains a list of pg4tcpmap commands and instructions for using them, as well as an example of the table. Refer to "Problem Determination" in the Oracle Procedural Gateway for APPC User's Guide for information about the trace file for the executed pg4tcpmap tool.

To operate this tool, execute the following command:

```
C:\> cd %ORACLE_HOME%\bin
C:\> pg4tcpmap
```

Refer to "[Output for the pg4tcpmap Tool](#)" on page B-4 for a sample of the pg4tcpmap output.

## 10.9 Verifying the Gateway Installation and OLTP Configuration

To verify the gateway installation and the OLTP configuration, perform the following procedures after installing the gateway.

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**Note:** If your database link name is not "PGA," modify the demonstration .sql files to give them the particular database link name that you created in Step 5 of "[Configuring the Oracle Integrating Server: First Time Installation](#)" on page 10-3. You must modify the following .sql files:

- pgavsn.sql
  - pgaecho.sql
  - pgaims.sql
- 
-

## 10.9.1 Verifying the Gateway Installation

To verify the gateway software installation using the database link PGA previously created, perform the following steps:

1. Using SQL\*Plus, connect to your Oracle Integrating Server as user PGAADMIN.
2. Run %ORACLE\_HOME%\pg4appc\demo\pgavsn.sql.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo
SQL> @pgavsn.sql
```

The server version number banner appears at your terminal. You will receive the following output:

```
Oracle Procedural Gateway for APPC (extension TCP/IP for IMS Connect).
Version 10.2.0.1.0 Fri Jun 3 13:12:49 2005
```

```
Copyright (c) Oracle Corporation 1979,
2005. All rights reserved.
```

```
PL/SQL procedure successfully completed.
```

3. Run %ORACLE\_HOME%\pg4appc\demo\pgaecho.sql.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo
SQL> @pgaecho.sql
```

You will receive the following output:

```
==> Congratulations, your installation was successful. <==
```

## 10.9.2 Verifying the OLTP Configuration

Use the following procedure to verify the OLTP configuration.

---



---

**Attention:** If you have not completed the file transfers detailed in ["Preparing to Configure a Gateway Installation/Upgrade"](#) on page 10-2, then complete them now, before proceeding to the next step.

---



---

### 10.9.2.1 IMS/TM Verification

Perform the following steps to verify the IMS/TM configuration. Be certain that you have installed and configured the IMS Connect and that it is up and running before you begin this procedure. Refer to the *IBM IMS Connect Guide and Reference* for information about how to perform the installation and configuration tasks.

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**Note:** TIPs must be recompiled when changing the communication protocol to TCP/IP.

TCP/IP only: If you have existing TIPs that were generated previously on a gateway using the SNA protocol and you want to use the new TCP/IP feature, then the TIPs will have to be regenerated by PGAU with mandatory NLS\_LANGUAGE and Side Profile Settings. Specify the suitable ASCII character set in the DEFINE TRANSACTION command.

This is because the gateway assumes that the appropriate user exit in IMS Connect is being used, which would translate between the suitable ASCII and EBCDIC character sets.

---



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1. To verify that the FLIP transaction is installed correctly, log on to your IMS/TM system and enter the following transaction (replacing *FLIP* with the transaction ID you chose for FLIP when you configured the IMS/TM system for the gateway):

```
FLIP THIS MESSAGE
```

The following output appears on your terminal:

```
EGASSEM SIHT PILF
```

---



---

**Attention:** If you have not completed the file transfers detailed in [Section 10.2 "Preparing to Configure a Gateway Installation/Upgrade"](#) on page 10-2, then complete them now, before proceeding to the next step.

---



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2. From your Windows platform, modify the `pgaims.sql` file, which resides at `%ORACLE_HOME%\pg4appc\demo\IMS\pgaims.sql`. Customize the following three items used for accessing the gateway and the IMS/TM system, as described in the comments at the beginning of the file:
  - the IMS/TM transaction ID
  - the side profile name
  - the logmode entry name
3. Ensure that the TCP/IP communication protocol on your system has been started.
4. Using SQL\*Plus, connect to your Oracle Integrating Server from PGAADMIN.
5. Run `pgaims.sql`.

```
C:\> cd %ORACLE_HOME%\pg4appc\demo\IMS
SQL> @pgaims.sql
```

The following message appears:

```
==> Congratulations, your gateway is communicating with IMS/TM <==
```

Your IMS/TM installation verification is now complete.

## 10.10 Performing Postinstallation Procedures

The following are optional steps that you can perform as necessary. Installation of the sample applications for the OLTP is recommended to help you to fully understand how the gateway works and how it interfaces with the OLTP.

### 10.10.1 Installing Sample Applications

Your Oracle Procedural Gateway for APPC featuring TCP/IP for IMS Connect contains sample PL/SQL procedures and OLTP transaction programs that demonstrate the gateway's capabilities.

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**Note:** When you are calling a gateway that is using TCP/IP as the communication protocol, and you are using EBCDIC as the language in the control files, you must change the language from EBCDIC to ASCII. Some examples of control files that may be in EBCDIC language are `ivtno.ctl` and `ivtnv.ctl`.

For more information, refer to the  
%ORACLE\_HOME%\pg4appc\demo\IMS\ivtno.ctl and  
%ORACLE\_HOME%\pg4appc\demo\IMS\ivtnv.ctl files.

---

---

Samples are provided for IMS/TM:

- IMS inquiry using `IVTNO` and `IVTNV` sample transactions

Additional samples are added to the distribution media in later releases of the product. Wherever possible, the sample applications use the sample databases provided with the database products.

For this release, full documentation on installing and using the sample applications is available in the `README.doc` files in the following directory:

%ORACLE\_HOME%\pg4appc\demo\IMS



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# Security Requirements

The gateway architecture involves multiple systems, database servers, and communications facilities, each having distinct security capabilities and limitations. To effectively plan and implement your security scheme, you must understand these capabilities and limitations, in addition to knowing your installation's security requirements.

Read this chapter to learn about the capabilities and limitations of the Oracle Procedural Gateway for APPC. This chapter contains the following sections:

- [Overview of Security Requirements](#)
- [Authenticating Application Logons](#)
- [Defining and Controlling Database Links](#)
- [Using SNA Security Validation](#)
- [TCP/IP Security](#)
- [Passwords in the Gateway Initialization File](#)

## 11.1 Overview of Security Requirements

Before implementing the security scheme, you must understand the existing security requirements and expectations in the environment. Because you are enabling application access to different databases on different systems, you must merge multiple security cultures. When developing your security scheme, the most stringent security requirements prevail. When you connect different systems into an operating whole, the system with the strictest security requirements generally dictates what the other systems can and cannot do.

Gateway security includes two main concerns:

- users and applications that are permitted access to a particular gateway instance and OLTP
- OLTP transactions that users and applications are able to execute

You can control access at several points in the gateway architecture. The primary options are discussed in the following sections. Control over remote transaction program (RTP) access is provided by each OLTP with native authorization mechanisms based on user ID. These facilities are described in the product documentation for your OLTP. Information in this chapter includes how the gateway facilities determine the user ID that is in effect for a particular OLTP connection.

When the gateway is involved in an RPC request, security mechanisms are in effect for each system component encountered by the gateway. The first system component that

is encountered is the application tool or 3GL program. The last system component that is encountered is the OLTP.

Each of the following sections identifies the component and the type of security processing that is available in that component. Each section offers a summary of key features and parameters. Refer to product-specific documentation for detailed information about the non-gateway components for Oracle and non-Oracle products.

## 11.2 Authenticating Application Logons

An application must connect to an Oracle Integrating Server before using that gateway. The type of logon authentication that you use determines the resulting Oracle user ID and can affect gateway operation.

Two basic types of authentication are available:

1. Oracle authentication.

With Oracle authentication, each Oracle user ID has an associated password that is known to Oracle. When an application connects to the server, it supplies a user ID and password. Oracle confirms that the user ID exists and that the password matches the one stored in the database.

2. Operating system authentication

With operating system authentication, the server's underlying operating system is responsible for authentication. An Oracle user ID that is created with the IDENTIFIED EXTERNALLY attribute (instead of a password) is accessed with operating system authentication. To log on to such a user ID, the application supplies a slash ( / ) for a user ID and does not supply a password.

To perform operating system authentication, the server determines the requester's operating system user ID, optionally adds a fixed prefix to it, and uses the result as the Oracle user ID. The server confirms that the user ID exists and is identified externally, but no password checking is done. The underlying assumption is that users were authenticated when they logged on to the operating system.

Operating system authentication is not available on all platforms and is not available in some Oracle Net (client-server) and multi-threaded server configurations. Refer to your Windows Oracle server documentation and *Oracle Database Net Services Administrator's Guide* to determine the availability of this feature in your configuration.

For more information about authenticating application logons, refer to the *Oracle Database Administrator's Guide*.

## 11.3 Defining and Controlling Database Links

The following sections discuss database links for users of the gateway employing either TCP/IP or SNA communications protocols.

### 11.3.1 Link Accessibility

The first point of control for a database link is whether it is accessible to a given user. A public database link can be used by any user ID. A private database link can be used only by the user who created it. Database link usability is determined by its ability to open a session to the gateway. The Oracle Integrating Server makes no distinction as to the type of use (such as read-only and update or write) or which remote objects can be accessed. These distinctions are the responsibility of the OLTP that is accessed.



### 11.3.2 Links and CONNECT Clauses

The `CONNECT` clause is another security-related attribute of a database link. You can use the `CONNECT` clause to specify an explicit user ID and password, which can differ from the user's Oracle user ID and password. This `CONNECT` user ID and password combination is sent to the gateway when the database link connection is first opened. Depending on gateway-specific options, the gateway might send that user ID and password to the OLTP to be validated.

If a database link is created without a `CONNECT` clause using Oracle authentication, then the user's Oracle user ID and password are sent to the gateway when the connection is opened. If the user logs on to the Oracle Integrating Server with operating system authentication, then the gateway receives no user ID or password from the Oracle Integrating Server. It is impossible for operating system-authenticated Oracle users to use a gateway database link defined without a `CONNECT` clause. However, if your OLTP provides user ID mapping facilities based on the gateway LU name from which the user is connecting, then such a connection is possible if all users on the same gateway instance can use the same OLTP user ID.

For more information about database links, refer to the *Oracle Database Administrator's Guide*.

## 11.4 Using SNA Security Validation

The information in this section applies only to the security needs of gateway users employing the SNA communications protocol. When an RPC request to start a remote transaction program is received by the gateway, the gateway attempts to start an APPC conversation with the OLTP. Before the conversation can begin, a session must start between Windows' Logical Unit (LU) and the OLTP LU.

APPC support for the Windows platform is provided by the SNA Server (Microsoft Host Integration Server or IBM Communication Server v6.1.1 or higher).

SNA and its various access method implementations, including VTAM and the SNA Server, provide security validation at session initiation time, allowing each LU to authenticate its partner. This validation is carried out entirely by network software before the gateway and OLTP application programs begin their conversation and process conversation-level security data. If session-level security is used, then correct password information must be established in Microsoft Windows' SNA profiles and in similar parameter structures in the OLTP to be accessed. Refer to the suitable communications software product documentation for detailed information about this subject.

### 11.4.1 Specifying SNA Conversation Security

The `PGA_SECURITY_TYPE` parameter of the gateway initialization file allows you to specify one of three options that determine the security conduct of the LU6.2 conversation that is allocated with the OLTP. These options are part of the SNA LU6.2 architecture, but their precise behavior might vary depending on the particular OLTP system.

#### 11.4.1.1 SNA Security Option `SECURITY=NONE`

If you specify `PGA_SECURITY_TYPE=NONE`, then the gateway performs no processing of the client user ID and password. The conversation is allocated with SNA option `SECURITY=NONE`.

### 11.4.1.2 SNA Security Option SECURITY=PROGRAM

If you specify `PGA_SECURITY_TYPE=PROGRAM`, then the gateway allocates the conversation with SNA option `SECURITY=PROGRAM`, and the following information is sent to the OLTP:

- If the TIP user ID and password overrides are used, then the specified user ID and password are sent regardless of the database link specification.
- If the database link has explicit `CONNECT` information, then the specified user ID and password are sent.
- If the database link has no `CONNECT` clause, and if the application logged on to Oracle with an explicit user ID and password, then the Oracle user ID and password are sent.
- If the application logs on to Oracle with operating system authentication, and if the database link lacks explicit `CONNECT` information, then no user ID and password are sent. If no user ID and password are sent, and if the OLTP is not configured to assign a default user ID, then the connection fails.

In general, SNA option `SECURITY=PROGRAM` tells the OLTP to authenticate the user ID/password combination using whatever authentication mechanisms are available. For example, if CICS Transaction Server for z/OS is the OLTP, then RACF can be used. This is not always the case, however, because each OLTP can be configured to process inbound user IDs in other ways.

## 11.5 TCP/IP Security

The security information in this section applies only to users of the Oracle Procedural Gateway for APPC using the TCP/IP for IMS Connect feature. When an RPC request to start a RTP is received by the gateway, the gateway attempts to start the TCP/IP conversation with IMS Connect. IMS Connect would contact the OLTP (IMS) through OTMA and XCF. Refer to the *IBM IMS Connect Guide and Reference* for more information. The conversation between the gateway and IMS Connect occurs when the network uses the TCP/IP address or host name and port number to connect from the gateway to IMS Connect.

---

**Note:** Because the gateway is using PGAU to generate TIPs, the TIPs contain SNA information. When using the Oracle Procedural Gateway for APPC with TCP/IP support for IMS Connect, you need to map the SNA names to the TCP/IP host name and port number in order for the gateway to communicate with IMS Connect. Use the `pg4tcpmap` tool to map the information from SNA to TCP/IP. Refer to Chapter 6, "*pg4tcpmap Commands*," of the Oracle Procedural Gateway for APPC *User's Guide* for more information.

---

IMS Connect provides validation at session initiation time, allowing each connection to authenticate its partner. This validation is carried out entirely by network software before the gateway and OLTP application programs at IMS begin their conversation and process conversation-level security data. If session-level security is used, then correct password information must be established in Microsoft Windows and in similar parameter structures in the OLTP to be accessed.

## 11.5.1 Specifying TCP/IP Conversation Security

The `PGA_SECURITY_TYPE` parameter of the gateway initialization file allows you to specify the security conduct for the conversation that is allocated by the gateway for OLTP. Refer to [Appendix B, "Gateway Initialization Parameters for TCP/IP Communication Protocol"](#).

### 11.5.1.1 TCP/IP Security Option SECURITY=NONE

If you specify `PGA_SECURITY_TYPE=NONE`, then the gateway performs no processing of the client user ID and password.

### 11.5.1.2 TCP/IP Security Option SECURITY=PROGRAM

If you specify `PGA_SECURITY_TYPE=PROGRAM`, then the following information is sent to the OLTP:

- If the TIP user ID and password overrides are used, then the specified user ID and password are sent regardless of the database link specification.
- If the database link has explicit `CONNECT` information, then the specified user ID and password are sent.
- If the database link has no `CONNECT` clause, and if the application logged on to Oracle with an explicit user ID and password, then the Oracle user ID and password are sent.
- If the application logs on to Oracle with operating system authentication, and if the database link lacks explicit `CONNECT` information, then no user ID and password are sent. If no user ID and password are sent, and if the OLTP is not configured to assign a default user ID, then the connection fails.

RACF is the only authentication mechanism available when the Oracle Procedural Gateway for APPC using TCP/IP for IMS Connect communicates with IMS Connect.

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**Important:** You must specify your RACF group name through the `pg4tcpmap` tool if you have set your PGA security option to `SECURITY=PROGRAM`. For more information about this issue, refer to the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows*.

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## 11.6 Passwords in the Gateway Initialization File

Initialization parameters may contain sensitive information, such as user IDs or passwords. Initialization parameters are stored in plain text files and may be deemed insecure. An encryption feature has been added to Heterogenous Services making it possible to encrypt parameters values. This is done through the `tg4pwd` utility.

**See Also:** Refer to *Oracle Database Heterogeneous Connectivity Administrator's Guide* for more information about this utility



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## Migration from Existing Gateways

Migrating to new instances of the Oracle Procedural Gateway for APPC from an existing installation is straightforward, provided you follow some guidelines. This chapter provides information to make these new installations as easy as possible. It also provides the parameters you will need if you are using the TCP/IP for IMS Connect communication protocol on your gateway.

This chapter provides information that is specific to this release of the Oracle Procedural Gateway for APPC for Microsoft Windows. It contains the following sections:

- [Migrating an Existing Gateway Instance to New Release Using SNA Protocol](#)
- [Migrating from an Existing Gateway Using SNA to TCP/IP](#)

## 12.1 Migrating an Existing Gateway Instance to New Release Using SNA Protocol

Follow these steps to migrate an existing gateway to Release 10.2.0.1.0 of the gateway using the SNA communication protocol.

Note that if you are using the gateway's TCP/IP support for IMS Connect, you will not be migrating an existing release to the current release of the gateway. However, you will need to place valid Heterogeneous Services parameters into your `initsid.ora` file. Proceed to "[Parameter Changes: Version 4 to Release 10.2.0.1.0 of the Gateway](#)" on page 12-3.

### 12.1.1 Step 1: Install the New Release

Install the new release of the gateway in a separate directory as outlined in [Chapter 4, "Installing the Gateway"](#).

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---

**Caution:** Do not install the gateway over an existing gateway installation. Doing so will corrupt the existing installation.

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### 12.1.2 Step 2: Transfer `initsid.ora` Gateway Initialization File Parameters

Copy the `initsid.ora` file from the old gateway instance to the new instance.

Note that if you are migrating from Release 9.0.1 or earlier of the gateway, then `PGA_TRACE` is not supported, you will need to modify the parameter to `TRACE_LEVEL`, instead.

---

---

**Note:** If you are using `TRACE_LEVEL`, then you must set the path for the `LOG_DESTINATION` parameter.

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### 12.1.3 Backout Considerations When Migrating to New Releases

Oracle recommends that you keep the old gateway Oracle home directory and instance configurations intact and operational when you are installing a new release of the gateway and upgrading existing instances, in case there are problems with the upgrade. This will help ensure minimal downtime between changes to different gateway instances.

### 12.1.4 Oracle Net Considerations

The Oracle Procedural Gateway for APPC uses the Heterogeneous Services (HS) facilities of Oracle and Oracle Net. If you are upgrading from a version 4 gateway, then you need to slightly modify the gateway service name entries in the `tnsnames.ora` file. Add an `(HS=)` clause to communicate to Oracle Net that the gateway uses HS facilities. For more information, refer to "[Configuring the Oracle Network for the Gateway](#)" on page 5-2.

## 12.1.5 Parameter Changes: Version 4 to Release 10.2.0.1.0 of the Gateway

This release of the Oracle Procedural Gateway for APPC introduces new and changed initialization parameters if you are migrating from version 4 gateway to release 10.2.0.1.0 of the gateway.

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**Note:** This section does not apply to you if you are migrating to release 10.2.0.1.0 from version 8 of the Oracle Procedural Gateway for APPC.

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If you are using the gateway's TCP/IP support for IMS Connect, then you will not be migrating from version 4 to the current release of the gateway. However, you will need to place valid Heterogeneous Services parameters into your *initsid.ora* file.

This chapter contains references to the particular HS parameters you need to run the gateway.

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**Note:** Refer to the *Oracle Connectivity Guide* for a complete list and descriptions of all HS parameters used in Oracle products.

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### New Gateway Initialization Parameters

The following parameters are in the gateway initialization file (*initsid.ora*):

- FDS\_CLASS
- FDS\_INSTANCE
- HS\_FDS\_FETCH\_ROWS
- LOG\_DESTINATION
- TRACE\_LEVEL
- PGA\_TCP\_DB (TCP/IP only)
- PGA\_TCP\_USER (TCP/IP only)
- PGA\_TCP\_PASS (TCP/IP only)

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**Note:** The HS\_ parameters are specific to Oracle Heterogeneous Services. For details on HS parameters, refer to the *Oracle Database Administrator's Guide*.

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### Renamed Gateway Initialization File Parameters

Following is a list of the gateway initialization file (*initsid.ora*) parameters that have been renamed in this release of the gateway, the parameters' former names are shown in parentheses.

- HS\_COMMIT\_STRENGTH\_POINT (COMMIT\_STRENGTH\_POINT)
- HS\_DB\_DOMAIN (DB\_DOMAIN)
- HS\_DB\_INTERNAL\_NAME (DB\_INTERNAL\_NAME)
- HS\_DB\_NAME (DB\_NAME)
- HS\_DESCRIBE\_CACHE\_HWM (DESCRIBE\_CACHE\_HWM)
- HS\_LANGUAGE (LANGUAGE)
- HS-NLS\_DATE\_FORMAT (NLS\_DATE\_FORMAT)
- HS-NLS\_DATE\_LANGUAGE (NLS\_DATE\_LANGUAGE)
- HS\_OPEN\_CURSORS (OPEN\_CURSORS)
- HS\_ROWID\_CACHE\_SIZE (ROWID\_CACHE\_SIZE)

### Obsolete Parameters

The following parameters are now obsolete. Please remove them from your configuration files:

- MODE
- SERVER\_PATH
- ERROR\_LOGGING
- ERROR\_REPORTING
- ERRORTAG
- GATEWAY\_SID
- GROUP\_BY\_OFF
- GTWDEBUG
- INCREMENT\_CURSORS
- INIT\_CURSORS
- LIST
- MAX\_LOG\_SIZE
- OPTIMIZE\_FILE\_OPEN
- ORDER\_BY\_OFF
- RESOLVE\_BINDS
- RETRY
- SET
- SNMP\_SUPPORT
- SQL\_TRACE
- TRIM\_CURSORS
- D\_OPEN\_CURSORS



- D\_INIT\_CURSORS
- D\_INCREMENT\_CURSORS
- D\_TRIM\_CURSORS
- PGA\_TRACE

### 12.1.6 Parameter Changes: Version 8 or Earlier to Gateway Release 10.2.0.1.0

The following startup shell script parameter must be added to *initsid.ora* if you are migrating from version 4 or version 8 gateway to the current release of the Oracle Procedural Gateway for APFC:

- FDS\_CLASS\_VERSION

### 12.1.7 Migrating from Gateway Release 9.0.1 or 9.2.0 to Gateway Release 10.2.0.1.0

No new parameters were added between release 9.0.1 and this release of the gateway.

## 12.2 Migrating from an Existing Gateway Using SNA to TCP/IP

The following sections are for users who have an existing release of the gateway using the SNA protocol but who wish to switch to using TCP/IP support for IMS Connect.

The TCP/IP support for IMS Connect feature in this release of the gateway allows you to continue to use existing TIPs.

### 12.2.1 To Use Existing TIPs with Existing Side Profile Definitions

Follow these instructions:

1. Make sure you have used the `pg4tcpmap` tool to insert valid parameter values into the `PGA_TCP_IMSC` table.

Refer to [Chapter 10, "Gateway Configuration Using TCP/IP Communication Protocol"](#) for instructions on loading the `PGA_TCP_IMSC` table.

2. Make sure that the `LANGUAGE` parameter in your TIPs is set to `american_america_us7ascii`.
3. Use `PGAU` to regenerate the IMS TIPs.
4. Add the following new TCP/IP parameters to the *initsid.ora* file:

- PGA\_TCP\_DB
- PGA\_TCP\_USER
- PGA\_TCP\_PASS

You will find descriptions and information about adding these parameters in [Section 12.1.5, "Parameter Changes: Version 4 to Release 10.2.0.1.0 of the Gateway"](#) on page 12-3. You will also find descriptions of the parameters in [Appendix B, "Gateway Initialization Parameters for TCP/IP Communication Protocol"](#).

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**Note:** If your TIPs from a previous version of the gateway were already defined using a side profile name and the `NLS_LANGUAGE` parameter has been set to a value of `american_america_us7ascii`, then you will not need to recompile these TIPs. You will still need to map your parameter values using the `pg4tcpmap` tool.

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## 12.2.2 To Use Existing TIPs with LU/TP/LOGMODE Names

The new TCP/IP support for IMS Connect feature of the gateway only supports side profile name coding in the IMS TIPs. If you have been using SNA on a gateway using LU/TP/LOGMODE combinations, then the following steps must be taken:

1. Edit the IMS TIPs; create an 8-character, unique identifier and insert it into the TIP as the Side Profile.

This identifier does not need to be a system-defined SNA side profile name it is simply a unique name.

2. Make sure you have used the `pg4tcpmap` tool to insert the SideProfile name into the `PGA_TCP_IMSC` table.

Refer to [Chapter 10, "Gateway Configuration Using TCP/IP Communication Protocol"](#) for instructions on loading the `PGA_TCP_IMSC` table.

3. Make sure that the `LANGUAGE` parm,eter in your TIPs is set to `american_america_us7ascii`.
4. Use `PGAU` to regenerate the IMS TIPs.
5. Add the following new TCP/IP parameters to the `initsid.ora` file:
  - `PGA_TCP_DB`
  - `PGA_TCP_USER`
  - `PGA_TCP_PASS`

You will find descriptions and information about adding these parameters in [Section 12.1.5, "Parameter Changes: Version 4 to Release 10.2.0.1.0 of the Gateway"](#) on page 12-3. You will also find descriptions of the parameters in [Appendix B, "Gateway Initialization Parameters for TCP/IP Communication Protocol"](#).

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**Note:** TIPS must be recompiled when changing the communication protocol from SNA to TCP/IP.

If you have existing TIPs that were generated previously on a gateway using the SNA protocol and you want to use the new TCP/IP feature, then the TIPs will have to be regenerated by `PGAU` with mandatory `NLS_LANGUAGE` and Side Profile Settings. Specify the suitable ASCII character set in the `DEFINE TRANSACTION` command.

This is due to the fact that the gateway assumes that the suitable user exit in IMS Connect is being used, which would translate between the suitable ASCII and EBCDIC character sets.

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## Gateway Initialization Parameters for SNA Protocol

This appendix describes the gateway initialization file location and lists the gateway initialization parameters supported by the Oracle Procedural Gateway for APPC specifically for the SNA protocol. These parameters are fully documented in [Section 12.1, "Migrating an Existing Gateway Instance to New Release Using SNA Protocol"](#) on page 12-2. In addition, this appendix contains sample listener.ora and tnsnames files for a gateway using SNA.

This appendix contains the following section:

- [Gateway Initialization Parameter File Using SNA Protocol](#)

## A.1 Gateway Initialization Parameter File Using SNA Protocol

The parameter file for the gateway is located in the %ORACLE\_HOME%\pg4appc\admin directory and is called *initsid.ora*.

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**Note:** The *initsid.ora* file contains both SNA and TCP/IP parameters. You must modify these files with the suitable parameters.

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### A.1.1 PGA Parameters

The PGA parameters control the APPC interface portion of the gateway.

PGA parameters are specified using the SET gateway initialization parameter. For example:

```
SET pga_parm=value
```

where:

- *pga\_parm* is one of the PGA parameter names in the list that follows; and
- *value* is a character string with contents that depend on *pga\_parm*

[Table A-1](#) provides a list of PGA parameters and their descriptions.

**Table A-1 PGA Parameters for Gateway Using SNA**

Parameter	Description
LOG_DESTINATION= <i>logpath</i>	<p><i>logpath</i> specifies the destination at which <i>STDERR</i> is reopened. <i>LOG_DESTINATION</i> specifies a directory only and <i>stderr</i> is reopened to <i>logpath\sid_pid.log</i></p> <p>where:</p> <ul style="list-style-type: none"> <li>▪ <i>sid</i> is the sid name</li> <li>▪ <i>pid</i> is the process ID assigned to the gateway</li> </ul>
PGA_CAPABILITY	<p>PGA transaction capability. This controls whether updates are allowed through the gateway. The following are valid values:</p> <p><i>READ_ONLY</i> or <i>RO</i>, read-only capabilities.</p> <p><i>SINGLE_SITE</i> or <i>SS</i>, single-site update only. This indicates that in a distributed environment, only the gateway can perform updates. No other database updates can occur within the Oracle transaction.</p> <p><i>COMMIT_CONFIRM</i> or <i>CC</i>, commit-confirm. This indicates that in a distributed environment, updates can be performed by both the gateway and other participants within the Oracle transaction. The gateway is always committed first in this mode, and no other commit-confirm sites are allowed to participate in the Oracle transaction.</p> <p>The default is <i>SINGLE_SITE</i>.</p>

**Table A-1 (Cont.) PGA Parameters for Gateway Using SNA**

Parameter	Description
PGA_CONFIRM	<p>Incoming APPC CONFIRM request handling option. This controls what the gateway does when an APPC CONFIRM request is received from the remote transaction program (RTP). This parameter has meaning only when the conversation is running with SYNCLEVEL &gt; 0. The following are valid values:</p> <p>ACCEPT - respond to incoming APPC CONFIRM requests with APPC CONFIRMED responses.</p> <p>REJECT - treat incoming APPC CONFIRM requests as errors causing the conversation to be deallocated and an error message to be issued.</p> <p>The default is REJECT.</p>
PGA_LOG_DB	<p>The Oracle Net service name for the Oracle server in which the gateway maintains its transaction log. This parameter can be from 1 to 255 characters long. This parameter is required only when PGA_CAPABILITY parameter is set to COMMIT_CONFIRM.</p> <p>There is no default value.</p>
PGA_LOG_PASS	<p>The Oracle password to be used by the gateway when connecting to the Oracle server specified by the PGA_LOG_DB parameter. The password can be from 1 to 30 characters long. This parameter is required only when PGA_CAPABILITY parameter is set to COMMIT_CONFIRM. The password can be encrypted. For more information about encrypting the password, refer to <a href="#">Section 11.6, "Passwords in the Gateway Initialization File"</a>.</p> <p>There is no default value.</p>
PGA_LOG_USER	<p>The Oracle user ID to be used by the gateway when connecting to the Oracle server specified by the PGA_LOG_DB parameter. The user ID can be from 1 to 30 characters long. This parameter is required only when PGA_CAPABILITY parameter is set to COMMIT_CONFIRM.</p> <p>There is no default value.</p>
PGA_RECOVERY_PASS	<p>The password to be used by the gateway when allocating an APPC conversation with the transaction specified by the PGA_RECOVERY_TPNAME parameter. The password can be from 1 to 8 characters long. This parameter is required only when PGA_CAPABILITY parameter is set to COMMIT_CONFIRM and PGA_SECURITY_TYPE parameter is set to PROGRAM. The password can be encrypted. For more information about encrypting the password, refer to <a href="#">Section 11.6, "Passwords in the Gateway Initialization File"</a>.</p> <p>There is no default value.</p>
PGA_RECOVERY_TPNAME	<p>The TP name of the transaction installed in the online transaction processor (OLTP) for commit-confirm FORGET and RECOVERY processing. The TP name can be from 1 to 64 characters long. For CICS Transaction Server for z/OS, the TP name is limited to four characters. For IMS/TM, the TP name is limited to eight characters. Other OLTPs might have other limits on the length of the TP name. This parameter is required only when PGA_CAPABILITY parameter is set to COMMIT_CONFIRM.</p> <p>The default value is RECO.</p>

**Table A-1 (Cont.) PGA Parameters for Gateway Using SNA**

Parameter	Description
PGA_RECOVERY_USER	The user ID to be used by the gateway when allocating an APPC conversation with the transaction specified by the PGA_RECOVERY_TPNAME parameter. The user ID can be from 1 to 8 characters long. This parameter is required only when PGA_CAPABILITY parameter is set to COMMIT_CONFIRM and PGA_SECURITY_TYPE parameter is set to PROGRAM or SAME.  There is no default value.
PGA_SECURITY_TYPE	APPC conversation security option. This controls what security parameters are sent to the OLTP in the FMH-5 at conversation allocation. The following are valid values:  NONE, which sends no security parameters  SAME, which sends only a user ID  PROGRAM, which sends a user ID and password  The default is NONE.  For further information about these options, refer to <a href="#">Chapter 11, "Security Requirements"</a> .
TRACE_LEVEL	PGA trace level. This controls tracing output written to stderr (the target of the LOG_DESTINATION parameter. The value must be an integer from 0 to 255.  The default is 0, indicating no tracing.  Any value between 1 and 255 will turn on tracing.

## A.1.2 PGA\_CAPABILITY Parameter Considerations

When choosing a setting for the PGA\_CAPABILITY parameter, take care to ensure that the correct setting is used based on what the RTPs will be doing.

The READ\_ONLY setting should always be used when the RTPs are read-only, that is, when the RTPs perform no database updates. READ\_ONLY should never be used when the RTPs perform database updates. For example, if the READ\_ONLY setting is chosen, and if a RTP called by the gateway performs updates to a foreign database, then the Oracle Integrating Server does *not* provide any integrity protection for those updates. Further, READ\_ONLY mode allows a gateway transaction to be part of a distributed transaction that might update several other databases. If the gateway calls a RTP that performs updates in this situation and if a failure occurs, then the database updated by the RTP is out of sync with the other databases.

In cases where the RTPs perform updates to foreign databases, there are two options for PGA\_CAPABILITY:

- SINGLE\_SITE
- COMMIT\_CONFIRM

Each of these options provides protection against data integrity problems by permitting COMMIT and ROLLBACK requests to be forwarded to the RTP and by informing the Oracle Integrating Server about the distributed update and recovery capabilities of the gateway. The particular option chosen depends on the design of the RTPs and upon the capabilities of the OLTP where they execute.

If the OLTP has LU6.2 SYNCLEVEL 1 or 2 support, then the COMMIT\_CONFIRM capability provides limited two-phase commit between the Oracle Integrating Server and the OLTP, with the restriction that no other commit-confirm site (gateway or

Oracle) can be part of the distributed transaction. If it is not possible to use `COMMIT_CONFIRM`, then the `SINGLE_SITE` capability provides update capability between the Oracle Integrating Server and the OLTP, with the restriction that only the OLTP can perform updates, and no updates can occur on the Oracle side.

Each of the `PGA_CAPABILITY` options for update control imposes specific requirements on the RTP and on the OLTP. For `COMMIT_CONFIRM` capability, these requirements are discussed in detail in Chapter 5, "Implementing Commit-Confirm," of the *Oracle Procedural Gateway for APPC User's Guide*. Also refer to [Section 9.8.3, "Configuring the OLTP for Commit-Confirm"](#) on page 9-12 in this guide. For `SINGLE_SITE` capability, the RTP is responsible for performing the suitable tasks in response to `COMMIT` and `ROLLBACK` requests received from the gateway on behalf of the Oracle Integrating Server. The gateway uses the `APPC_CONFIRM` and `SEND_ERR` requests to implement `COMMIT` and `ROLLBACK`, respectively. On receipt of a `CONFIRM` command, the RTP must perform `COMMIT` processing and then respond to the gateway with an `APPC_CONFIRMED` response. On receipt of a `SEND_ERR` command, the RTP must perform `ROLLBACK` processing.

Because the distributed transaction capability of the Oracle Integrating Server is affected by the `PGA_CAPABILITY` option used by the gateway, it is desirable to separate inquiry and update applications by using different gateway instances for each. One gateway can be defined with `PGA_CAPABILITY` set to `READ_ONLY` and others with `PGA_CAPABILITY` set to `SINGLE_SITE` or `COMMIT_CONFIRM`.

This allows read-only transaction programs to participate in distributed transactions under the control of the Oracle Integrating Server. For example, data from DB2 can be retrieved through the `READ_ONLY` gateway by an inquiry-only RTP, and can then be used as input to database updates on the Oracle Integrating Server, all in one Oracle transaction. A `SINGLE_SITE` gateway can be used only for accessing RTPs which perform updates to foreign databases outside the scope of control of the Oracle Integrating Server. Data can be read from any databases accessible to the Oracle Integrating Server, and that data can be used to perform updates through the gateway.

When it is necessary to update resources on both the Oracle side and the OLTP side, a `COMMIT_CONFIRM` gateway can be used, provided that the OLTP and the RTPs are set up to implement `COMMIT_CONFIRM`.

All that is necessary to set up multiple gateway instances is to set up the following for each instance:

- an entry in the `listener.ora` file defining the *sid* of the gateway instance
- an entry in the `tnsnames.ora` file defining an alias to be used to connect to the gateway instance defined in `listener.ora`
- a database link in the Oracle Integrating Server that specifies the alias defined in the `tnsnames.ora` file in its `USING` parameter.

Note that the gateway instances can share one common directory structure and use the same executables.

For example, to set up two gateways, PGAI and PGAU (for inquiry and update use, respectively), the following steps are required:

1. Define entries in listener.ora for two *sids*, PGAI and PGAU.
2. Define two aliases in tnsnames.ora that connect to the two new *sids*, PGAI and PGAU.
3. Define two database links in the Oracle Integrating Server, one connecting to PGAI and the other connecting to PGAU.
4. Finally, create the initialization files initPGAI.ora and initPGAU.ora.

In initPGAI.ora, set `PGA_CAPABILITY` to `READ_ONLY`, and in initPGAU.ora, set `PGA_CAPABILITY` to `SINGLE_SITE` or `COMMIT_CONFIRM`. Then, use the PGAI gateway for inquiry-only transactions, and use the PGAU gateway for update transactions.

The same steps can be used to set up additional gateway instances.

### A.1.3 PGA\_CONFIRM Parameter Considerations

When deciding upon the setting for the `PGA_CONFIRM` parameter, it is important to understand the effects of each setting. First, keep in mind that this parameter affects only those conversations running at `SYNCLEVEL 1`. The default setting, `PGA_CONFIRM=REJECT`, is suitable for most applications. With this setting, the gateway generates an error if a `CONFIRM` request is received from the remote transaction program. If you have a remote transaction that uses `CONFIRM` to verify that data was received by the gateway, then you must use `PGA_CONFIRM=ACCEPT` to allow the gateway to respond to those incoming `CONFIRM` requests with `CONFIRMED` responses. You must be aware that the gateway sends `CONFIRM` requests to the remote transaction when the Oracle application has issued a `COMMIT` request. In order for the `COMMIT` processing to work correctly, the remote transaction must be written to perform its local commit processing whenever a `CONFIRM` request is received from the gateway, and respond to the gateway with `CONFIRMED` after the commit processing has successfully completed. If an error occurs during commit processing, then the remote transaction must respond to the gateway with `SEND_ERR` to indicate that the commit failed.

One special case for the use of `PGA_CONFIRM=ACCEPT` is with IMS/TM version 7. When using the implied APPC support that is provided by IMS/TM version 7, conversations that run at `SYNCLEVEL 1` are handled differently than conversations that run at `SYNCLEVEL 0`. IMS/TM automatically generates `CONFIRM` requests after each APPC `SEND` when the conversation is at `SYNCLEVEL 1`. On the gateway side, if `PGA_CONFIRM=ACCEPT` is not specified, then the `CONFIRM` requests sent by IMS/TM result in errors generated by the gateway. Using `PGA_CONFIRM=ACCEPT` alleviates this problem, allowing the gateway to respond to incoming `CONFIRM` requests with `CONFIRMED` responses. The only limitation with running this way is that the implied APPC support provided by IMS does not notify the application when a `CONFIRM` request is received from the gateway. This means that the gateway cannot use `CONFIRM` to implement `COMMIT`, thereby disabling the use of `COMMIT/ROLLBACK` to control updates on the IMS side of the conversation.



### A.1.4 Sample listener.ora File for a Gateway Using SNA

```

LISTENER =
  (ADDRESS_LIST =
    (ADDRESS=
      (COMMUNITY= TCP.world)
      (Host = bay)
      (PROTOCOL= TCP)
      (Port= 2621)
    )
    (ADDRESS=
      (COMMUNITY= TCP.world)
      (Host = bay)
      (PROTOCOL= TCP)
      (Port= 2623)
    )
  )

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = PGA)
      (ORACLE_HOME = C:\oracle\pga\10.2)
      (PROGRAM = pg4asrv)
    )
  )

```

### A.1.5 Sample tnsnames.ora File for a Gateway Using SNA

```

ORA920 =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = bay.us.oracle.com) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = ORA920.bay)
    )
  )

PGA =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = bay) (PORT = 2621))
    )
    (CONNECT_DATA =
      (SID = PGA)
    )
    (HS = OK)
  )

```



---

---

## Gateway Initialization Parameters for TCP/IP Communication Protocol

This appendix lists and describes the parameters needed specifically for a gateway featuring the TCP/IP for IMS Connect communication protocol. It also provides a sample output of the pg4tcpmap tool. In addition, this appendix contains sample listener.ora and tnsnames.ora files for a gateway using TCP/IP. It contains the following sections:

- [Gateway Initialization Parameter File Using TCP/IP](#)
- [Output for the pg4tcpmap Tool](#)

## B.1 Gateway Initialization Parameter File Using TCP/IP

The parameter file for the Oracle Procedural Gateway for APPC using TCP/IP for IMS Connect is located in the %ORACLE\_HOME%\pg4appc\admin directory and is called *initsid.ora*.

---



---

**Note:** The *initsid.ora* file contains both SNA and TCP/IP parameters. You will need to modify these files with the appropriate parameters.

---



---

### B.1.1 PGA Parameters

The Procedural Gateway Administration (PGA) parameters control the TCP/IP interface portion of the gateway.

PGA parameters are specified using the SET gateway initialization parameter. For example:

```
SET pga_parm=value
```

where:

- *pga\_parm* is one of the PGA parameter names in the list that follows
- *value* is a character string with contents that depend on *pga\_parm*

Table B-1 provides a list of PGA parameters and their descriptions.

**Table B-1 PGA Parameters on Gateway Using TCP/IP for IMS Connect**

Parameter	Description
LOG_DESTINATION= <i>logpath</i>	<p><i>logpath</i> specifies the destination at which STDERR is reopened. LOG_DESTINATION specifies a directory only, and <i>stderr</i> is reopened to <i>logpath\sid_pid.log</i></p> <p>where:</p> <ul style="list-style-type: none"> <li>■ <i>sid</i> is the sid name</li> <li>■ <i>pid</i> is the process ID assigned to the gateway</li> </ul> <p>NOTE: This parameter will be used for the pg4tcpmap tool when you set your Trace Level to 255. The log file for this tool will reside in the same place as the gateway log file, in <i>pg4tcpmap_sid.log</i>.</p>
PGA_CAPABILITY	<p>PGA transaction capability. The following are valid values:</p> <p>READ_ONLY or RO: read-only capabilities.</p> <p>SINGLE_SITE or SS: single-site update only. This indicates that in a distributed environment, only the gateway can perform updates. No other database updates can occur within the Oracle transaction.</p> <p>The default is SINGLE_SITE.</p>

**Table B-1 (Cont.) PGA Parameters on Gateway Using TCP/IP for IMS Connect**

Parameter	Description
PGA_SECURITY_TYPE	<p>TCP/IP conversation security option. This controls what security parameters are sent to the OLTP. The following are valid values:</p> <p>NONE, which sends no security parameters</p> <p>PROGRAM, which sends a user ID and password</p> <p>The default is NONE.</p> <p>For further information on these options, refer to <a href="#">Chapter 11, "Security Requirements"</a>.</p> <p><b>Important:</b> You must specify your RACF group name through the pg4tcpmap tool if you have set your PGA security option to SECURITY=PROGRAM. For more information about this issue, refer to the <i>Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows</i>.</p> <p>If you have already loaded the table pga_tcp_ims and you did not first specify the RACF group name, then delete the row and reinsert it with the value for the RACF group name.</p>
PGA_TCP_DB	<p>The Oracle Net service name for the Oracle server in which the gateway receives its TCP/IP for IMS Connect information, such as host name and port number. This parameter can be from 1 to 255 characters long. This parameter is required.</p> <p>There is no default value.</p>
PGA_TCP_PASS	<p>The Oracle password to be used by the gateway when connecting to the Oracle server specified by the PGA_TCP_DB parameter. The password can be from 1 to 30 characters long. This parameter is required. The password can be encrypted. For more information about encrypting the password, refer to <a href="#">Section 11.6, "Passwords in the Gateway Initialization File"</a>.</p> <p>There is no default value.</p>
PGA_TCP_USER	<p>The Oracle user ID to be used by the gateway when connecting to the Oracle server specified by the PGA_TCP_DB parameter. The user ID can be from 1 to 30 characters long. This parameter is required.</p> <p>There is no default value.</p>
TRACE_LEVEL	<p>PGA trace level. This controls tracing output written to <code>stderr</code> (the target of the LOG_DESTINATION parameter.) The value must be an integer from 0 to 255.</p> <p>The default is 0, indicating no tracing.</p> <p>NOTE: This parameter will be used in the pg4tcpmap tool as well as the gateway.</p>

## B.2 Output for the pg4tcpmap Tool

The following output illustrates the results from executing the pg4tcpmap tool when running TCP/IP for IMS Connect on the gateway. Refer to [Section 10.8, "Loading the PGA\\_TCP\\_IMSC Table"](#) on page 10-12 of this guide and to Chapter 6 of the Oracle Procedural Gateway for APPC *User's Guide* for detailed information about the function and parameters of the pg4tcpmap tool.

Note that input in this sample is shown within brackets angle brackets (<>).

```
C:\oracle\bin\<pg4tcpmap>
```

```
PG4TCPMAP: Release 10.2.0.1.0 - Production on Fri Jun 3 14:57:41 2005
```

```
Copyright(c) 1982,2005 Oracle Corporation. All rights reserved.
```

```
This tool takes the IMS Connect TCP/IP information, such as host name and port number and maps them to your TIPS.
```

```
You may use this tool to insert or delete IMS Connect TCP/IP information.
```

```
If you want to insert a row, type I
```

```
If you want to delete a row, type D
```

```
<i>
```

```
Enter the Unique Side Profile.
```

```
pgaimst
```

```
Enter either the remote hostname or its TCP/IP address.
```

```
<mvs08>
```

```
Enter the IMS Connect port number.
```

```
<9900>
```

```
Do you want to select a Conversational Protocol?(Y|N)
```

```
The default is NO, 'no request for acknowledgment or deallocation'
```

```
<n>
```

```
Enter one of the following letters for Timer.
```

```
For .25 second, enter 'D'.
```

```
For .01 to .25 second, enter 'S'.
```

```
For 'does not set the timer, no wait occurs', enter 'N'.
```

```
For Receive waits indefinitely, enter 'I'.
```

```
The default is 'D'.
```

```
<d>
```

```
Enter one of the following letters for 'socket connection type'.
```

```
For transaction socket, enter 'T'.
```

```
For persistent socket, enter 'P'.
```

```
For non-persistent socket, enter 'N'.
```

```
The default is 'T'.
```

```
<t>
```

```
Do you want to enter the client ID name? (Y|N)
```

```
If NO, IMS Connect (user exit) will generate it.
```

```
<n>
```

```
Enter one of the following letters for 'commit mode'.
```

```
For Commit Mode set to 0, enter '0'.
```

```
For Commit Mode set to 1, enter '1'.
```

```
The default is '1'.
```

```
<1>
```

```
Enter the Datastore name (IMS Destination ID).
```

```
The maximum string length is 8 and the Datastore name must be specified.
```

```
<imse>
```

```
Do you want to enter the LTERM? (Y|N)
```

```
If NO, the default is blank.
```

```
<n>
```

```

Do you want to enter the RACF group name? (Y|N)
If NO, the default is blank.
<n>
Requested to INSERT a row.
'Side Profile name' is 'PGAIMST'
'remote host name' is 'MVS08'
'IMS Connect port number' is '9900'
'conversational protocol' is ' '
'Timer' is 'D'
'socket connection type' is 'T'
'client ID' is ' '
'commit mode' is '1'
'Datastore name (IMS destination ID)' is 'IMSE '
'IMS LTERM override' is ' '
'RACF group name' is ' '
pg4tcpmap is complete.

```

## B.2.1 Sample listener.ora File for a Gateway Using TCP/IP

```

LISTENER =
  (ADDRESS_LIST =
    (ADDRESS=
      (COMMUNITY= TCP.world)
      (Host = bay)
      (PROTOCOL= TCP)
      (Port= 2621)
    )
    (ADDRESS=
      (COMMUNITY= TCP.world)
      (Host = bay)
      (PROTOCOL= TCP)
      (Port= 2623)
    )
  )

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = PGA)
      (ORACLE_HOME = C:\oracle\pga\10.2)
      (PROGRAM = pg4t4ic)
    )
  )

```

## B.2.2 Sample tnsnames.ora File for a Gateway Using TCP/IP

```
ORA920 =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = bay.us.oracle.com) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = ORA920.bay)
    )
  )

PGA =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = bay) (PORT = 2623))
    )
    (CONNECT_DATA =
      (SID = PGA)
    )
    (HS = OK)
  )
```



---

---

# Gateway Terminology

This appendix contains a list of terms and definitions pertaining to the gateway and its components and function.

For a list of other terms and definitions associated with the gateway, refer to Chapter 1 of the Oracle Procedural Gateway for APPC *User's Guide*.

This appendix contains the following section:

- [Gateway Term Definitions](#)

## C.1 Gateway Term Definitions

Following is a list of some of the terms and definitions used in this edition of the *Oracle Procedural Gateway for APPC Installation and Configuration Guide*.

### Gateway Initialization File

This file is known as *initsid.ora* and it contains parameters that govern the operation of the gateway. If you are using the SNA protocol, then refer to [Appendix A, "Gateway Initialization Parameters for SNA Protocol"](#) for more information. Refer to [Appendix B, "Gateway Initialization Parameters for TCP/IP Communication Protocol"](#) if your protocol is TCP/IP.

### Gateway Remote Procedure

The Oracle Procedural Gateway for APPC provides prebuilt remote procedures. In general, the following three remote procedures are used:

- PGAINIT, which initializes transactions
- PGAXFER, which transfers data
- PGATERM, which terminates transactions

Refer to ["Remote Procedural Call Functions"](#) on page 1-10 in this guide and to [Appendix C, "Gateway RPC Interface"](#) in the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* for more information about gateway remote procedures.

### tg4pwd

**tg4pwd** is a utility which encrypts passwords that are normally stored in the gateway initialization file. Passwords are stored in an encrypted form in the password file, making the information more secure. Refer to ["Passwords in the Gateway Initialization File"](#) on page 11-5 for detailed information about how the tg4pwd utility works.

### **pg4tcpmap tool**

This gateway mapping tool is applicable only when the gateway is using TCP/IP support for IMS Connect. Its function is to map the side profile name to TCP/IP and IMS Connect attributes into the PGA\_TCP\_IMSC table.

### **PGA**

Procedural Gateway Administration (PGA) is a general reference within this guide to all or most components comprising the Oracle Procedural Gateway for APPC. This term is used when references to a specific product or component are too narrow.

### **PGDL**

Procedural Gateway Definition Language (PGDL) is the collection of statements used to define transactions and data to the PGAU.

### **PL/SQL Stored Procedure Specification (PL/SQL package)**

This is a precompiled PL/SQL procedure that is stored in Oracle Integrating Server.

### **UTL\_RAW PL/SQL Package (the UTL\_RAW Functions)**

This component of the gateway represents a series of data conversion functions for PL/SQL RAW variables and remote host data. The types of conversions performed depend on the language of the remote host data. Refer to "UTL\_RAW Functions" in Appendix D of the Oracle Procedural Gateway for APPC User's Guide for more information.

### **UTL\_PG PL/SQL Package (the UTL\_PG Functions)**

This component of the gateway represents a series of COBOL numeric data conversion functions. Refer to "NUMBER\_TO\_RAW and RAW\_TO\_NUMBER Argument Values" in Appendix D of the Oracle Procedural Gateway for APPC User's Guide for supported numeric datatype conversions.

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## Summary of Changes in Previous Versions

This appendix provides a summary of changes in previous versions of the Oracle Procedural Gateway for APPC.

This appendix contains the following sections:

- [Changes and Enhancements in Previous Versions](#)
- [Corrected Problems in Previous Versions](#)
- [Known Restrictions in Previous Releases](#)

### D.1 Changes and Enhancements in Previous Versions

The following sections list changes and enhancements that were made to previous releases of the gateway.

#### D.1.1 Release 10.1.0.2.0

The following section lists changes and enhancements that were made to release 10.1.0.2.0 of the gateway:

- TCP/IP Support for Connecting the Gateway to IMS Connect Release 1.2

This release of the gateway includes TCP/IP support for IMS Connect. IMS Connect is an IBM product which allows TCP/IP clients to trigger execution of IMS transactions. The gateway can use a TCP/IP communication protocol to access IMS Connect, which triggers processing of IMS transactions. There is no SNA involvement with this configuration. Related to this new feature of the gateway is the pg4tcpmap tool. This release of the gateway includes a new tool whose purpose is to map the information from your side profile name to TCP/IP and IMS Connect attributes. You may turn on a trace for this tool as well. For more information about the gateway mapping tool refer to [Chapter 10, "Gateway Configuration Using TCP/IP Communication Protocol"](#).

**Tip:** refer to *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows* for more information about the gateway mapping tool.

- Improved Gateway Log File

The log file for the gateway remote application has been improved.

## D.1.2 Release 9.2.0.1.0

The following section lists changes and enhancements that were made to Release 9.2.0.1.0 of the gateway:

- Oracle Call Interface: Because of changes to the Oracle Call Interface (OCI), Oracle Procedural Gateway for APPC internal codes for calling COMMIT or CONFIRM have changed. This does not affect user functions.
- APPC log file: The Oracle Procedural Gateway for APPC log file has been improved and provides more information about transactions. For a sample of the new log file, refer to Chapter 6 of the *Oracle Procedural Gateway for APPC User's Guide for Microsoft Windows, Release 9.2.0.1.0*.
- Password encryption utility for gateway initialization file: This release of the gateway includes a utility to support encryption of plain-text passwords in the gateway initialization file.

## D.1.3 Release 9.0.1.1.0

The following section lists changes and enhancements that were made to Release 9.0.1.1.0 of the gateway:

- Release 9.0.1.1.0 of the Oracle Procedural Gateway for APPC requires an Oracle9i release 9.0.1.1.0 (Oracle 9i database server 9.0.1) or higher Oracle Integrating Server.
- If you are installing Oracle Procedural Gateway for APPC release 9.0.1.1.0 on the system for the first time, the *ORACLE\_HOME* directory is C:\orant, by default.

## D.1.4 Release 9.0.1.0.1

The following section lists changes and enhancements that were made to Release 9.0.1.0.1 of the gateway:

- PGA\_TRACE parameter no longer supported: With this release of Oracle Procedural Gateway for APPC, the PGA\_TRACE parameter is no longer supported. If you are copying the *initsid.ora* file from an older version of the gateway, then you must remove this parameter.
- FDS\_CLASS\_VERSION parameter added: You will need to add the FDS\_CLASS\_VERSION parameter to your startup shell script file (*initsid.ora*). A default value is specified in *initsid.ora*.

## D.1.5 Release 8.0.6.0.0

The following section lists changes and enhancements that were made to Release 8.0.6.0.0 of the gateway:

- The Oracle Procedural Gateway for APPC does not support Oracle7 server or earlier.
- Heterogeneous Services architecture  
This release of Oracle Procedural Gateway for APPC uses the Oracle Heterogeneous Services component within the Oracle8 server. Heterogeneous Services is the building block for the next generation of Oracle Open Gateways.
- Performance enhancements  
Oracle Procedural Gateway for APPC contains several internal performance enhancements. This product has shown major improvements over the version 4

gateways, particularly in response time and CPU utilization for all relevant address spaces for a variety of workloads. The actual performance improvement at your site may vary, depending on your installation type and workload.

- PL/SQL V3 compatibility

Before release 8, you had to set the `PLSQL_V2_COMPATIBILITY` parameter to `TRUE` to compile PGAU80-generated TIP specifications. This is no longer necessary.

- Oracle server dependencies

This release of Oracle Procedural Gateway for APPC requires that the Oracle Integrating Server be an Oracle8 server Release 8.0.6.0.0 or later.

- Gateway initialization parameters

In previous versions of the gateway, the initialization parameters were stored in files named `initsid.gtwboot` and `initsid.ora`, both found in the gateway instance directories. With version 8, most parameters that were in `initsid.gtwboot` have been moved to the `initsid.ora` file. The syntax of `initsid.ora` has been simplified.

When migrating from previous releases of the gateway, be aware of these differences.

- `tnsnames.ora`: The service name definition (from the Oracle Integrating Server to the gateway) must contain an extra parameter, `(HS= (DRIVER) )`.

- In this release of the Oracle Procedural Gateway for APPC for Microsoft Windows, the following names have changed:

- `PGAU80.EXE` (known as `PGAU80`) has been changed to `PGAU.EXE` (known as `PGAU`).
- `PG4APPC80.EXE` (known as `PG4APPC80`) has been changed to `PG4APPC.EXE` (known as `PG4APPC`)

- With this release of the Oracle Procedural Gateway for APPC for Microsoft Windows, the gateway no longer runs as a Windows service. The process-based gateway provides faster performance because it does not need a management utility. Instead, each Oracle Integrating Server user session that accesses a particular gateway creates an independent process on Windows that runs the gateway server and executes SNA functions.

- `GTWSRV.EXE` is no longer included

As a result of the process-based gateway, the Oracle Procedural Gateway for APPC package no longer includes the `GTWSRV.EXE` management utility.

- The process-based gateway removes the restriction of a four-character limit for the SID name. Refer to the *Oracle Database Net Services Administrator's Guide* for more information about character limits for SID names.

- The `GTWCONF.EXE` process is no longer included in the Oracle Procedural Gateway for APPC for Windows, beginning with this release.

- Microsoft SNA Server version 2 is no longer supported with this release of the Oracle Procedural Gateway for APPC for Microsoft Windows.

## D.1.6 Release 4.0.1.1.0

The following section lists changes and enhancements that were made to release 4.0.1.1.0 of the gateway:

- Gateway components now based on Oracle7 Server release 7.3.3  
The gateway components are now built using the Oracle7 server release 7.3.3 product libraries as a base. All product components shipped with the gateway, including SQL\*Net, are now at the release 7.3.2 level.
- Gateway supports Oracle8 Server release 8.0.3  
The gateway now supports Oracle8 server release 8.0.3 as an integrating server.
- UTL\_PG now shipped with Oracle Server  
The scripts for installing the UTL\_PG PL/SQL package are now shipped with the Oracle7 or Oracle8 server and are no longer shipped with the gateway.
- Gateway no longer supports Oracle7 Server release 7.1.6 and 7.2  
The gateway no longer supports Oracle7 server release 7.1.6 and 7.2 as integrating servers.
- User ID and password overrides now supported by gateway (Enh. No. 423300)  
A new TIP override is now available to allow the user ID and password sent by the gateway to the OLTP to be specified by the user. For complete information about using this override, refer to "Overriding TIP Initializations" in Chapter 2 of the *Oracle Procedural Gateway for APPC User's Guide*.
- New LENGTH IS clause supported by PGAU (Enh. No. 428783)  
A new LENGTH IS clause in COBOL data definitions is now recognized by PGAU and allows the definition of variable-length character fields without using OCCURS DEPENDING ON. For complete information on using this clause, refer to "Format Conversion" in Appendix G of the *Oracle Procedural Gateway for APPC User's Guide*.
- Date/time stamp in trace output  
All trace and debug output from the gateway server now contains a date/time stamp in the beginning of each line.
- Installer improvements: The installer prompts not relevant to the gateway have been eliminated to streamline the installation process.

## D.2 Corrected Problems in Previous Versions

The following tables list the numbers and descriptions of each bug fixed in previous releases of the gateway.

### D.2.1 Release 10.1.0.2.0

Table D-1 lists the bugs that were fixed in Release 10.1.0.2.0 of the gateway, along with their descriptions:

**Table D-1** Bugs fixed in Release 10.1.0.2.0

Bug Number	Description
1310776	PG4APPC to support TCP/IP connectivity to IMS 1472845 Receiving message ORA-1401: handling multiple items in one call to PGAXFER causes error.
1847587	Receiving message ORA-2047: executing procedures against read-only gateways.
1853035	The gateway generates the wrong message (PGA-20936) instead of generating message number PGA-20938.

**Table D-1 (Cont.) Bugs fixed in Release 10.1.0.2.0**

Bug Number	Description
1919413	Receiving an ORA-28528 error (Heterogeneous Services datatype conversion error) when sending a buffer of more than 4 K of data to C
2088612	Receiving message ORA-1401: inserted value too large for column.
2222386	Transferring more than 32760 bytes in a RAW field. Customer receives error message ORA-01401: "inserted value too large for column". When the gateway attempts to transfer 32760 or more bytes back to Oracle in a single transfer, the result is ORA-02055: "distributed update operation failed; rollback required".
2505566	PGDDVCHK.SQL does not require spooling file.
2526386	CMDEAL not called in certain error situations in PGAXFER.
2691119	ORA-06510: PL/SQL: Unhandled user-defined exception when using PGATRAC.
3067506	Savepoint and rollback savepoint are not supported by PG4APPC.

## D.2.2 Release 9.2.0.1.0

Table D-2 lists the bugs that were fixed in Release 9.2.0.1.0 of the gateway, along with their descriptions:

**Table D-2 Bugs Fixed in Release 9.2.0.1.0**

Bug Number	Description
1276298	When using an invalid value for the RECEIVE parameter for the pgaxfer procedure, the user receives an ORA 28511 error message.
1302253	Oracle Procedural Gateway for APPC procedure statements executed on the Oracle integrating servers would stop responding in SQL*Plus, without giving any messages.
1336805	When the PGA_SECURITY_TYPE parameter was set to PROGRAM and the PGA_CAPABILITY parameter was set to COMMIT_CONFIRM, the user received an authentication error but could not see who was complaining about it.
1404454	The pg4appc log file should be improved and have the received buffer in the log file.
1411694	The user receives message ORA-28527 when the PGA_CAPABILITY is set to READ_ONLY.
1472800	Multirow queries failed on the following error messages: ORA-01401 and ORA-06512.
1519088	User received sporadic abnormal termination when inserting CICS records to VSAM file.
1677939	Oracle Procedural Gateway for APPC would partially transfer low values to VSAM files.
1722467	When the PGA_SECURITY_TYPE parameter was set to PROGRAM and the user specified the user ID and password through database link explicit CONNECT information, the query failed with message PGA-20910 RC=6.

**Table D-2 (Cont.) Bugs Fixed in Release 9.2.0.1.0**

<b>Bug Number</b>	<b>Description</b>
1724988	When the programmer used RPC PGAINIT_SEC, no matter what synclevel was being used, the following message was received: "invalid SYNCHLEVEL, 152, specified; valid range is 0:1."
2092204	When using PGATCTL procedure specifying the function code as "D," the user received the message PGA-20932 with an invalid function code.
2128785	Oracle Server Heterogeneous Services place unwanted trace files into \tmp directory.



## D.2.3 Release 9.0.1.0.1

Table D-3 lists the bugs that were fixed in Release 9.0.1.0.1 of the gateway, along with their descriptions:

**Table D-3 Bugs Fixed in Release 9.0.1.0.1**

Bug Number	Description
1276298	When using an invalid value for receive parameter for the pgaxfer procedure, the user receives an ORA-28511 error message.
1302253	Oracle Procedural Gateway for APPC procedure statements executed on the Oracle integrating servers would stop responding in SQL*Plus, without giving any messages.
1336805	When the PGA_SECURITY_TYPE parameter was set to PROGRAM and the PGA_CAPABILITY parameter was set to COMMIT_CONFIRM, the user received an authentication error but could not see who was complaining about it.
1404454	The pg4appc log file should be improved and have the received buffer in the log file.
1411694	The user receives message ORA-28527 when the PGA_CAPABILITY is set to READ_ONLY.
1472800	Multirow queries failed on the following error messages: ORA-01401 and ORA-06512.
1519088	User received sporadic abnormal termination when inserting CICS records to VSAM file.
1677939	Oracle Procedural Gateway for APPC would partially transfer low values to VSAM files.
1722467	When the PGA_SECURITY_TYPE parameter was set to PROGRAM and the user specified the user ID and password through database link explicit CONNECT information, the query failed with message PGA-20910 RC=6.
1724988	When the programmer used RPC PGAINIT_SEC, no matter what synclevel was being used, the following message was received: "invalid SYNCHLEVEL, 152, specified; valid range is 0:1."

## D.2.4 Release 8.0.6.0.0

Table D-4 lists the bugs that were fixed in Release 8.0.6.0.0 of the gateway, along with their descriptions:

**Table D-4 Bugs Fixed in releases 8.0.6.0.0**

Bug Number	Description
1329386	PGAU core dumped on large packages. When users tried to generate large packages with PGAU, they got a core dump.
561128	The PLSTYPE attribute of binary integers (COBOL COMP data items) had the wrong precision when the data was defined without COMPOPTS ( 'TRUNC (BIN) ' ) specified.
599696	PGAU COBOL parser did not accept OCCURS clause appearing before datatype as valid syntax.
603934	When COBOL data definitions contained OCCURS and REDEFINES, the PGAU-generated .pkb file was invalid.
689304	This bug occurred when a CICS transaction abended between the time that the Oracle server called the gateway to perform a commit and the time that the CICS transaction was successfully committed.  When this occurred, the Oracle recovery process (RECO) would call the gateway's recovery function (GTARECO) to resolve the transaction. The GTARECO function mistakenly relayed that it had successfully rolled back the CICS transaction, but in fact it had failed to delete the row from PGA_CC_PENDING.
883761	System Process - Out of virtual Memory. After hours of service, pg4appc.exe would fail with an access violation. Using Windows Task Manager, user would see pg4appc growing in memory continuously, until reaching the maximum amount of virtual memory. Then pg4appc.exe failed with an access violation.

## D.2.5 Release 4.0.1.1.0

Table D-5 lists the bugs that were fixed in Release 4.0.1.1.0 of the gateway, along with their descriptions:

**Table D-5 Bugs Fixed in Release 4.0.1.1.0**

Bug Number	Description
420391	PGAU generated invalid PL/SQL in the TIP when a COBOL definition contained an OCCURS clause and was defined as an IN OUT parameter. A PLS-103 error was generated when attempting to compile the TIP.
460960	ORA-9199 errors were generated by the gateway after some gateway exceptions due to a memory overlay.
473360	PGAU encountered a segment fault when executing a GENERATE command for a transaction with a very large number of fields defined in its COBOL data.
506777	An ORA-1017 error was generated by the gateway when RECO attempted to log on to the gateway during recovery of a distributed transaction, though the gateway was running in READ-ONLY mode.
521084	ORA-3106 errors were generated by the gateway on Windows under heavy transaction load.

## D.3 Known Restrictions in Previous Releases

The following section lists restrictions that were known to exist in previous releases of the gateway. A current list of problems is available online at:

<http://metalink.oracle.com>

If you have problems accessing this online information, then contact Oracle Support Services for assistance.

### D.3.1 Release 9.2.0.1.0

No known problems were documented in Release 9.2.0.1.0 of the Oracle Procedural Gateway for APPC.

### D.3.2 Release 8.0.6.1.0 and 4.0.1.1.0

The following problems in other products are known to affect the operation of products in this release:

- UTL\_PG Does Not Handle Numeric Data Values Between 0 and +1 (Bug No. 360427)  
The UTL\_PG.NUMBER\_TO\_RAW function erroneously displays messages ORA-08414 and ORA-08467 when converting an Oracle number between 0 and +1 into a COBOL numeric value. Contact Oracle Support Services to order the patch correcting this bug.
- PGA Grows Excessively When Using Indexed PL/SQL Tables (Bug No. 373700)  
When TIPs that use large PL/SQL tables are executed, the memory usage grows excessively. Contact Oracle Support Services to order the patch correcting this bug.
- UTL\_PG Does Not Handle Leading or Trailing Signs Correctly for DISPLAY Data (Bug No. 383510)  
The UTL\_PG.RAW\_TO\_NUMBER and UTL\_PG.NUMBER\_TO\_RAW functions do not handle leading or trailing signs correctly for numeric data defined with USAGE IS DISPLAY. Contact Oracle Support Services to order the patch correcting this bug.



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## Configuration Worksheet

The following worksheet lists the parameter names and the reasons you will need them to configure the gateway and the communications interface you have chosen (either SNA or TCP/IP). Use the worksheet to gather the specific information you need before you begin the configuration process.

Ask your systems administrator to provide you with any parameter names you do not know.

**Table E-1 Parameters for Configuring Gateway and Communication Protocols**

Name of Parameter Needed	Purpose	Your Specific Parameters Here
ORACLE_HOME	for: gateway's Oracle Home	_____
ORACLE_SID	for: gateway's system ID	_____
Any Security Options Needed	for: SNA remote LU properties options	_____
Suitable Name for Each Side Information Profile	for: SNA creating CPI-C symbolic destination names (side information profiles), general information	_____
Suitable Mode	for: SNA	_____
TP Name	for: SNA partner information in CPI-C name properties	_____
Partner LU Name Alias	for: SNA partner information in CPI-C name properties	_____
Unique Side Profile Name	for: Configuring TCP/IP support for IMS Connect	_____
Remote Host name or TCP/IP Address	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
IP Address	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____

**Table E-1 (Cont.) Parameters for Configuring Gateway and Communication Protocols**

Name of Parameter Needed	Purpose	Your Specific Parameters Here
IMS Connect Port Number	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
Conversational Protocol (Y/N)	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
Timer choice:		
a) .25	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
b) .01 to .25		
c) Does not exist		
d) Receives wait		
_____		
Socket Connection Type Choice:	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
a) transaction		
b) persistent		
c) nonpersistent		
_____		
IMS Client ID Name	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
_____		
IMS Commit Mode Choice:	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
a) 0		
b) 1		_____
_____		
IMS Destination ID, datastore name	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
_____		
LTERM	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
_____		
RACF Group Name	for: Configuring TCP/IP support for IMS Connect, pg4tcpmap tool	_____
_____		

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