Oracle® Procedural Gateway for APPC

Installation and Configuration Guide

Release 9.2.0.1.0 for Windows

May 2002
Part No. A96651-01
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Part No. A96651-01

Oracle Corporation welcomes your comments and suggestions on the quality and usefulness of this document. Your input is an important part of the information used for revision.

- Did you find any errors?
- Is the information clearly presented?
- Do you need more information? If so, where?
- Are the examples correct? Do you need more examples?
- What features did you like most?

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If you would like a reply, please give your name, address, telephone number and telephone number.

If you have problems with the software, please contact your local Oracle Support Services.
Preface

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

- administering the gateway
- setting up gateway security
- using the gateway
- diagnosing gateway errors

You should understand the fundamentals of the Windows operating system, SNA, procedural gateways, PL/SQL, and the Oracle server before using this guide to install, configure, or administer the gateway.

Intended Audience

This guide is intended for anyone responsible for installing, configuring, or administering the Oracle Procedural Gateway for APPC. It is also for developers writing applications that access remote host databases through the gateway.

Product Name

The complete name for this product is Oracle Procedural Gateway for APPC for Windows Release 9.2.0.1.0.

Related Publications

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

Oracle Procedural Gateway for APPC User’s Guide for Windows

You might also need Oracle server and Oracle Net documentation. The following Oracle publications are referenced in this guide:

- Oracle9i Server Installation Guide
- Oracle9i Server Administrator’s Guide
- Oracle9i Server Application Developer’s Guide
- Oracle9i Server Distributed Systems
- Oracle9i Server Messages
- Oracle Net Administrator’s Guide

Other related publications are listed in "Documentation Requirements" on page 3-5 of this book. Refer to the Oracle Technical Publications Catalog and Price Guide for a complete list of documentation provided for Oracle products.

Conventions

In this guide, Windows refers to the Windows 95, Windows 98, Windows NT, Windows 2000, and the Windows XP operating systems.

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

> mkdir \ORACLE\your_name

All output is shown as it actually appears. For input, these conventions apply:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>example text</td>
<td>Words or phrases, such as <code>mkdir</code> and <code>ORACLE</code>, must be entered exactly as spelled and in the letter case shown. In this example, <code>mkdir</code> must be entered in lowercase letters and <code>ORACLE</code> in uppercase.</td>
</tr>
<tr>
<td>italic text</td>
<td>Italicized uppercase or lowercase, such as <code>your_name</code>, indicates that you must substitute a word or phrase, such as the actual directory name.</td>
</tr>
<tr>
<td>bold text or bold italic text</td>
<td>Bold words or phrases refer to a file or directory structure, such as a directory, path, or file ID.</td>
</tr>
</tbody>
</table>
Other punctuation, such as commas, quotes, or the pipe symbol (|), must be entered as shown unless otherwise specified. Directory names, file names, 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* in a file name indicates that those portions that are in *italics* can vary.

Gateway commands, file names, reserved words, and keywords appear in uppercase in examples and text. Commands, environment variables, and keywords appear in the required letter case in examples and text. Reserved words and keywords must always be entered as is, because 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.

**DOS Prompts**

The DOS prompt, >, appears in DOS command examples. Enter your response at the prompt. Do not enter the text of the prompt, >, 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.
**Storage Measurements**

Storage measurements use these 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

**Documentation Accessibility**

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**Accessibility of Code Examples in Documentation**  JAWS, a Windows screen reader, may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, JAWS may not always read a line of text that consists solely of a bracket or brace.

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

- **Product Set** on page 1-2
- **Changes and Enhancements in Release 9.2.0.1.0** on page 1-2
- **Known Restrictions** on page 1-4
Product Set

The following table lists the components that are included on the product CD-ROM:

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<th>Release Number</th>
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</thead>
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<td>Oracle Procedural Gateway for APPC</td>
<td>9.2.0.1.0</td>
</tr>
<tr>
<td>Procedural Gateway Administration Utility</td>
<td>9.2.0.1.0</td>
</tr>
<tr>
<td>Oracle Net</td>
<td>9.2.0.1.0</td>
</tr>
</tbody>
</table>

Changes and Enhancements in Release 9.2.0.1.0

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

Changes

The following sections provide information on changes.

Oracle Call Interface

Because of changes to the Oracle Call Interface (OCI), Oracle Procedural Gateway for APPC internal codes for calling COMMIT/CONFIRM have changed. This does not affect user functions.

APPC Log File

The Oracle Procedural Gateway for APPC log file is 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 UNIX.

Enhancements

Components of Oracle Procedural Gateway for APPC are now based on Oracle9i release 9.2.0.1.0 (the Oracle Integrating Server).

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. For more information, refer to Chapter 5.
Bugs Fixed in Version 9i

Table 1–1 lists the bugs that have been fixed in version 9i of the gateway, along with their descriptions.

<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>1276298</td>
<td>When using an invalid value for receive parameter for the pgaxfer procedure, the user receives an ORA 28511 error message.</td>
</tr>
<tr>
<td>1302253</td>
<td>Oracle Procedural Gateway for APPC procedure statements executed on the Oracle Integrating Servers would hang in SQL*Plus, without giving any messages.</td>
</tr>
<tr>
<td>1336805</td>
<td>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.</td>
</tr>
<tr>
<td>1404454</td>
<td>The pg4appc log file should be improved and have the received buffer in the log file.</td>
</tr>
<tr>
<td>1411694</td>
<td>The user receives message ORA-28527 when the PGA_CAPABILITY is set to READ_ONLY.</td>
</tr>
<tr>
<td>1472800</td>
<td>Multi-row queries failed on the following error messages: ORA-01401 and ORA-06512.</td>
</tr>
<tr>
<td>1519088</td>
<td>User received sporadic abends when inserting CICS records to VSAM file.</td>
</tr>
<tr>
<td>1677939</td>
<td>Oracle Procedural Gateway for APPC would partially transfer low values to VSAM files.</td>
</tr>
<tr>
<td>1722467</td>
<td>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.</td>
</tr>
<tr>
<td>1724988</td>
<td>When the programmer used RPC PGAINIT_SEC, no matter what synchlevel was being used, the following message was received: &quot;invalid SYNCHLEVEL, 152, specified; valid range is 0:1.&quot;</td>
</tr>
<tr>
<td>2092204</td>
<td>When using PGATCTL procedure with specifying the function code as &quot;D&quot;, the user receives the message PGA-20932 with an invalid function code.</td>
</tr>
<tr>
<td>2128785</td>
<td>Oracle Server Heterogeneous Services place unwanted trace files into /tmp directory.</td>
</tr>
</tbody>
</table>
Known Restrictions

The following restrictions are known to exist in this release of the product.

**Multi-byte Character Sets Are Not Supported for Numeric Data and Clauses**
Since version 3.4, Oracle Procedural Gateway for APPC supports multi-byte character set data for IBM VS COBOL II PIC G datatypes. 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 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 Oracle Procedural Gateway for APPC.

**Floating Point Datatype Conversion is Not Supported**
Conversion of the floating point datatype is not supported by Oracle Procedural Gateway for APPC.

**Transaction Programs and Data Compression and Decompression**
Oracle Procedural Gateway for APPC does not provide exits for compression and decompression facilities. All data exchanged between the Oracle Procedural Gateway for APPC and the transaction must be in uncompressed format.

**PGAU USAGE(NULL) on DEFINE/REDEFINE DATA Not Implemented**
The USAGE(NULL) keyword on the DEFINE or REDEFINE DATA PGAU statements is not yet implemented, even though it is documented.

**PGAU Does Not Process COBOL COPY REPLACE Correctly**
When COBOL input to the PGAU DEFINE DATA statement contains a COPY REPLACE clause, only the first replacement is made correctly.

Oracle Procedural Gateway for APPC enables users to initiate transaction program execution on remote online transaction processors (OLTPs). It provides Oracle applications seamless access to IBM mainframe data and services through Remote Procedure Call (RPC) processing.

This chapter discusses the architecture, uses, and features of Oracle Procedural Gateway for APPC. It contains the following sections:

- **Overview** on page 2-2
- **Features** on page 2-2
- **Terms** on page 2-4
- **Architecture** on page 2-7
- **Transaction Types** on page 2-11
Overview

The Oracle Procedural Gateway for APPC extends the Remote Procedure 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. This architecture allows efficient access to data and transactions available on the IBM mainframe.

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

Features

The Oracle Procedural Gateway for APPC provides the following benefits:

- 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 system, overhead occurs only when your program executes.

- Location transparency
  Client applications need not be operating system-specific. For example, your application can call a program in a CICS region on MVS. If you move the program to a CICS region on OS/2, 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.

- **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 dictionary to store information relevant to the remote transaction
  - a tool to generate the PL/SQL Transaction Interface Package (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 Oracle Procedural Gateway for APPC 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 your mainframe system.

- **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
Terms

The following sections describe the terms used throughout this guide.

**Gateway Initialization File**
This file is known as `initsid.ora` and it contains parameters that govern the operation of the gateway. Refer to Appendix A, "Gateway Initialization Parameters" for more information.

**Gateway Remote Procedure**
Oracle Procedural Gateway for APPC provides pre-built remote procedures. In general functions, the following three remote procedures are used:

- PGAINIT, which initializes transactions
- PGAXFER, which transfers data
- PGATERM, which terminates transactions

Refer to "Remote Procedure Call Functions" in Chapter 1 and to Appendix C, "Gateway RPC Interface" in the Oracle Procedural Gateway for APPC User's Guide for Windows for more information about gateway remote procedures.

**Oracle Integrating Server**
This is any Oracle server instance that communicates with the Oracle Procedural Gateway for APPC for purposes of performing remote procedure calls to execute remote transaction programs (RTP). The Oracle Integrating Server can be on the same system with 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 2–2, "Oracle Procedural Gateway for APPC 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, IMS/TM, and IDMS-DC.

**PGA (Procedural Gateway Administration)**
P GA 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.
**PGAU (Procedural Gateway Administration Utility)**
PGAU is the tool 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 Windows* for more information about PGAU.

**PG DD (Data Dictionary)**
This component of the Oracle Procedural Gateway for APPC is a repository of remote host transaction definitions and data definitions. PGAU accesses definitions in the 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 Windows* for a list of PG DD tables.

**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 the Oracle Integrating Server.

**RPC (Remote Procedure Call)**
RPC is a programming call that executes program logic on one system in response to a request from another system. See "Gateway Remote Procedure" on page 2-4 for more information, and refer to Appendix C, "Gateway RPC Interface" in the *Oracle Procedural Gateway for APPC User’s Guide for Windows* as well.

**RTP (Remote Transaction Program)**
A remote transaction program 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 remote transaction program through the gateway, you must use RPC to execute a PL/SQL program to call the gateway functions.

**TIP (Transaction Interface Package)**
A TIP is an Oracle PL/SQL package that exists between your application and the remote transaction program. The transaction interface package, or TIP, 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/UTL_PG functions.

**UTL_RAW PL/SQL Package (the UTL_RAW Functions)**

This component of the Oracle Procedural Gateway for APPC is 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 Windows* for more information.

**UTL_PG PL/SQL Package (the UTL_PG Functions)**

This component of the Oracle Procedural Gateway for APPC is 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 Windows* for supported numeric datatype conversions.

Figure 2–1, "Relationship Between Gateway and Oracle Integrating Server on Windows" shows where the terminology discussed in the preceding sections applies within the gateway’s architecture.
The architecture of the Oracle Procedural Gateway for APPC consists of three components:

1. The Oracle Integrating Server

This server should include the distributed option. The Oracle Integrating Server is usually installed on the same Windows system as the Oracle Procedural Gateway for APPC.

If you install the Oracle Integrating Server on a system other than the Windows 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...
Server must be capable of connecting to the gateway through any supported Oracle Net protocol.

Refer to Chapter 1, "Release Information" for a list of Oracle Net protocols currently supported by the gateway and tools.

The Oracle Integrating Server can also be used for non-gateway applications.

2. The gateway

The Oracle Procedural Gateway for APPC must be installed on a workstation that can run the required version of Windows.

3. An OLTP (online transaction processor)

The OLTP must be on a system accessible to the Windows workstation using the SNA APPC protocol. Multiple Oracle Integrating Servers can access the same gateway. A single Windows gateway installation can be configured to access more than one OLTP.

Figure 2–2 shows the architecture of the Oracle Procedural Gateway for APPC as described in the preceding sections.

Figure 2–2  Oracle Procedural Gateway for APPC Architecture
Implementation

The gateway consists of the following components, some of which are the same as an Oracle database instance on Windows. The gateway has the following components:

- a home directory, similar to the one associated with an Oracle instance’s ORACLE_HOME registry variable
- a system identifier, identified as $sid$ or ORACLE_SID
- an initialization parameter file, similar to the Oracle Integrating Server’s init$sid$.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

Starting the Gateway

The gateway is no longer started in the same way as an Oracle database instance. It has no background processes and does not need a management utility such as Oracle Enterprise Manager. 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 to communicate with an OLTP.

Communication

All of the communication between the Oracle Integrating Server, the gateway, and the target system are handled through a transaction interface package (TIP). The TIP is a standard PL/SQL package that provides the following functions:

- declares the PL/SQL variables that can be exchanged with a remote transaction program
- calls the gateway packages that handle the APPC communication for starting the conversation, exchanging data, and terminating the conversation
- handles all datatype conversions between PL/SQL datatypes and the target program datatypes

The Procedural Gateway Administration Utility (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:

\[\text{function\_name@dblink\_name}\]

### Remote Procedure Call Functions

The Oracle Procedural Gateway for APPC provides a set of functions that are invoked by the client through a remote procedure call (RPC). These functions direct the gateway to initiate, transfer data with, and terminate remote transaction programs running under an OLTP on another system. The following tables list the remote procedure call functions and the correlating commands that are invoked in the gateway and remote system:

<table>
<thead>
<tr>
<th>Application</th>
<th>Oracle TIP</th>
<th>Gateway</th>
<th>Remote System</th>
</tr>
</thead>
<tbody>
<tr>
<td>call tip_init</td>
<td>tip_init</td>
<td>PGAINIT</td>
<td>Initiate program</td>
</tr>
<tr>
<td></td>
<td>call pgainit@gateway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>call tip_main</td>
<td>tip_main</td>
<td>PGAXFER</td>
<td>Exchange data</td>
</tr>
<tr>
<td></td>
<td>call pgaxfer@gateway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>call tip_term</td>
<td>tip_term</td>
<td>PGATERM</td>
<td>Terminate program</td>
</tr>
<tr>
<td></td>
<td>call pgaterm@gateway</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Remote Transaction Initiation

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

### 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 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.

**Remote Transaction Termination**
When communication with the remote program is complete, the gateway function PGATERM terminates the conversation between the gateway and the target system. PGATERM uses the conversation identifier as an INPUT parameter to request conversation termination.

**Transaction Types**
The Oracle Procedural Gateway for APPC supports two types of transactions that read data from and write data to remote systems:

- **one-shot**
  In a one-shot transaction, the application executes initialization, 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.

- **multi-conversational**
  In a multi-conversation transaction, the procedural gateway server can be used to exchange multiple records in one call to the remote transaction program.


The following examples demonstrate 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.
This chapter describes the system requirements of Oracle Procedural Gateway for APPC. It contains the following sections:

- Hardware Requirements on page 3-2
- Software Requirements on page 3-3
- Documentation Requirements on page 3-5
**Hardware Requirements**

The following sections describes the hardware requirements for Oracle Procedural Gateways for APPC.

**Processor**

Oracle Procedural Gateway for APPC requires an Intel or 100% compatible personal computer (PC) based on a processor that can run the required version of Windows.

**Memory**

For most installations, 256 M of RAM is recommended to support Oracle Procedural Gateway for APPC and Microsoft Windows products.

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

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

**Network Attachment**

Oracle Procedural Gateway for APPC requires any network attachment supported by Microsoft SNA Server.

**CD-ROM Drive**

A CD-ROM drive is required for installation of the software.
Disk Space
Oracle Procedural Gateway for APPC requires approximately 800M on Windows.

Software Requirements
The system software configuration described in these requirements is supported by Oracle Corporation provided that the underlying system software products are supported by their respective vendors. You should verify the latest support status with your system software vendors.

Operating System
Microsoft Windows Workstation or Server Version 4.0 and service pack 6a is required.

Communications
Microsoft SNA Server version 3.0 or later is required. IBM Communications Server Version 6.01 for Windows is also supported.

Oracle Integrating Server
The latest patchset for Oracle9i release 1 (9.0.1), Oracle9i release 2 (9.2.0), and Oracle8i release (8.1.7).
If necessary, refer to your vendor for the latest patchset information.

OLTP
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 in order for COMMIT/ROLLBACK to control the updates.
CICS/MVS and CICS/ESA
Release 4.3 or higher is required.

CICS/VSE
Release 2.3 or higher is required.

IDMS-DC
Release 12 or higher is required.

IMS/TM
Release 5.1 or later is required.

APPC/MVS
MVS/ESA release 4.2 or higher is required.

Caution: For a list of known restrictions, see Chapter 1, "Release Information" before proceeding with the installation of the gateway.

Oracle Networking Products
Oracle networking products installation requirements are as follows:

- Oracle Net Client and Oracle Adapter must be installed on the system where the Oracle9i Server is installed.
- Oracle Net Server and the Oracle Adapter must be installed on the system where the gateway is installed.
Documentation Requirements

Oracle Corporation recommends that you read the following documentation on products other than the gateway:

- PL/SQL User’s Guide and Reference
- Oracle9i Server Getting Started for Windows
- Oracle9i Administrator’s Reference
- Oracle9i Server Concepts
- Oracle9i Server Messages
- Oracle Net Administrator’s Guide
- Programmer’s Guide to the Oracle Call Interface

For Operating System and SNA communications package references, refer to the appropriate vendor documentation.
This chapter describes how to install and configure Oracle Procedural Gateway for APPC. It contains the following sections:

- **Before You Begin** on page 4-2
- **Planning to Upgrade the Gateway** on page 4-2
- **Performing Pre-Upgrade Procedures** on page 4-3
- **Performing Pre-Installation Procedures** on page 4-3
- **Installing the Gateway Software** on page 4-5
- **Configuring the Oracle Procedural Gateway for APPC** on page 4-7
- **Verifying the Installation** on page 4-24
- **Performing Post-Installation Procedures** on page 4-28
- **Deinstalling Your Oracle Procedural Gateway for APPC** on page 4-30
Before You Begin

Configuring an online transaction processor to allow access by the gateway requires actions on the 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, make sure 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. The final section, "Performing Post-Installation Procedures", contains information about expanding the configuration to multiple integrating servers and multiple OLTPs.

Planning to Upgrade the Gateway

This section is only for customers upgrading from a previous release of Oracle Procedural Gateway for APPC. If you are installing the gateway for the first time, begin with "Performing Pre-Installation Procedures" on page 4-3.

For information on changes or corrected problems for prior versions of the gateway, refer to Appendix C, "Summary of Changes in Previous Versions".

Upgrade Considerations

Upgrade considerations are as follows:

- PGAU control files from any earlier release are upward compatible - you do not need to change them.

- After an upgrade, the PG DD contains all of its earlier entries without modification. New PGAU control information is added along with some columns to support new features, but no customer entries are changed 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:
  - the PL/SQL compatibility
  - the gateway server RPC interface
Performing Pre-Installation Procedures

Before you install Oracle Procedural Gateway for APPC, perform the following pre-installation procedures:

- Ensure that the system meets all of the hardware and software requirements for Oracle Procedural Gateway for APPC.
  - Refer to Chapter 3, "System Requirements", for a list of the hardware and software 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.
- Decide on a SID (system identifier) for your gateway. This SID is used in the "Windows Configuration" section on page 4-16.

Performing Pre-Upgrade Procedures

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

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

Conversion of the UTL_PG Interface

- the UTL_PG interface

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

Restoration

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

- PGAU
- PG DD
- Gateway server
Performing Pre-Installation Procedures

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

- Ensure that your Windows system can communicate with the OLTP using SNA Server.

Refer to Chapter 6, "Configuring the SNA Communication Package on Windows", for more information about setting up and configuring SNA Server on a Windows system to run Oracle Procedural Gateway for APPC.

- If you need general information about installing Oracle products and using the Oracle Universal Installer, then refer to the Oracle9i Installation Guide for Windows.

You can install Oracle Procedural Gateway for APPC in either of the following ways:

- On the same system as the existing Oracle Integrating Server.
  
  All tasks for this type of installation or upgrade are discussed in this section.

- As a stand-alone installation without a local Oracle Integrating Server.

---

**Note:** In a stand-alone installation, PGAU executes on the same system as the gateway, not on the system that the Oracle Integrating Server is on. This might be a consideration in determining where to store and access PGAU input control files and output TIPs that are generated.

---

**Attention:** When the gateway is installed as a stand-alone or is accessed remotely, you must install Oracle Net to facilitate communication between the Oracle Integrating Server and the gateway. The selected Oracle Net must be supported by your Oracle Integrating Server and be installed with the gateway. All of the supporting components for the selected Oracle Net must be running on the gateway system. For example, if you select an Oracle Net protocol adapter, then the TNS listener must be configured and started on the gateway system. For complete information on installing and configuring Oracle Net, refer to Oracle Net Administrator’s Guide, Oracle Network Products User’s Guide for Windows NT/95 and Oracle9i Database Installation Guide for Windows.
Installing the Gateway Software

For general information about installing Oracle products and how to use the Oracle Universal Installer, refer to the Oracle9i Installation Guide for Windows.

To install the gateway software, perform the following steps:

1. Log on to your Windows system as a member of the Administrators group.
2. If you are installing the gateway for the first time, ensure that there is enough space on the disk where the gateway will reside, as specified in Chapter 3, “System Requirements”.
3. Before attempting the gateway installation process, you must stop all Oracle services that are currently running:
   a. Click Start, then Settings, then Control Panel.
   b. Choose Services. A list of all Windows services appears.
   c. Select an Oracle service (these services begin with "Oracle").
   d. Click Stop.
   e. Continue to select and stop Oracle services until all active Oracle services are stopped.
4. Insert the gateway product CD-ROM into your CD-ROM drive.
5. Verify that the drive is assigned to the logical drive you selected and that you can access files on the CD-ROM.

Note: The installation steps that follow assume that the CD-ROM drive is mapped to the D: drive.


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

a. From the Start Menu, select Run.

b. Enter the path of the executable file name. For example:
   D:\Disk1\setup.exe

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. Use the following table as a guide to the installation, following the instructions in the Response column.

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Oracle Universal Installer: Welcome</td>
<td>Click &quot;Next&quot;.</td>
</tr>
<tr>
<td>2. Oracle Universal Installer: File Locations</td>
<td>Specify the source and destination and click &quot;Next&quot;.</td>
</tr>
<tr>
<td>3. Oracle Universal Installer: Available Products</td>
<td>Select &quot;Oracle9i Database 9.2.0.1.0&quot; and click &quot;Next&quot;.</td>
</tr>
<tr>
<td>4. Oracle Universal Installer: Installation Types</td>
<td>Select &quot;Custom&quot; and click &quot;Next&quot;.</td>
</tr>
</tbody>
</table>
  b. Select "Oracle Transparent Gateways 9.2.0.1.0"  
  c. Open this row.  
  d. Select "Oracle Procedural Gateway for APPC 9.2.0.1.0".  
  e. Click "Next". |
| 6. Oracle Net Configuration Assistance: Welcome | Click "Cancel". |
| 7. Oracle Net Configuration Assistance: | Click "Yes". |
| 8. Oracle Universal Installer: Configuration Tools | Click "Exit". |
| 9. Oracle Universal Installer: End of Installation | Click "Exit". |
| 10. Exit | Click "Yes". |

Oracle Procedural Gateway for APPC is now installed.

7. 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\log directory. The default file name is InstallActions.log.

4-6 Oracle Procedural Gateway for APPC Installation and Configuration Guide
Configuring the Oracle Procedural Gateway for APPC

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

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

Pre-Configuration Steps

The following steps describe how to prepare for the configuration of your Oracle Integrating Server.

Stand-alone Gateway Installation/Upgrade

If you are installing or upgrading the gateway stand-alone (on a system that has no Oracle Integrating Server installed), then you must transfer some of the gateway administrative files to the system where your Oracle Integrating Server resides. The files are in the gateway C:\orant\pg4appc\admin directory. All files in this directory that have the suffix .sql, .pkh, and .pkb should be copied into a similarly named directory in the Oracle Integrating Server’s C:\orant directory.

Your Oracle Integrating Server DBA can create the directory using the following commands:

> cd \orant
> mkdir pg4appc
> mkdir pg4appc\admin

Use whatever file transfer mechanism is available on your system to copy all of the .sql, .pkh, and .pkb files from the gateway C:\orant\pg4appc\admin directory to the Oracle Integrating Server’s C:\orant\pg4appc\admin directory.

Now proceed with "Configuring the Oracle Integrating Server for First-Time Installations" on page 4-8 if this is a first-time installation, or with "Upgrading the Oracle Integrating Server from Previous Releases" on page 4-10 if this is an upgrade.
Configuring the Oracle Integrating Server for First-Time Installations

If you are installing Oracle Procedural Gateway for APPC for the first time, follow these steps to configure your Oracle Integrating Server:

1. Ensure that the UTL_RAW PL/SQL package is installed on the Oracle Integrating Server. All PGAU-generated TIP specifications use UTL_RAW, which provides routines for manipulating raw data. To check if the UTL_RAW PL/SQL package is installed on the Oracle Integrating Server perform the following:
   a. Use SQL*Plus to connect to the Oracle Integrating Server as the SYS user.
   b. Enter the following SQL*Plus command:
      ```sql
      SQL> DESCRIBE UTL_RAW;
      ```
      The DESCRIBE statement should produce an output on your screen. If you browse through that output, you should see some functions, including a COMPARE function. If you do not see this output, then continue the UTL_RAW installation by performing steps c and d.
      If the DESCRIBE statement indicates success, then the Oracle Integrating Server has UTL_RAW installed and you can proceed to Step 2.
   c. If necessary, use SQL*Plus to connect to the Oracle Integrating Server as the SYS user.
   d. Run the utlraw.sql and prvtrawb.plb scripts from the Oracle Integrating Server C:\orant\rdbms\admin directory. Note that you must run the utlraw.sql script first.

2. Ensure that the DBMS_OUTPUT standard PL/SQL package is enabled on the Oracle Integrating Server. The sample programs and installation verification programs on the distribution media use this standard package. To check that the DBMS_OUTPUT standard PL/SQL package is enabled, perform the following:
   a. If necessary, use SQL*Plus to connect to the Oracle Integrating Server as the SYS user.
   b. Enter the following SQL*Plus command:
      ```sql
      SQL> DESCRIBE DBMS_OUTPUT;
      ```
The DESCRIBE statement should produce output onscreen. If you browse through that output, you should see some functions, including a put_line function.

If the DESCRIBE statement indicates success, then the Oracle Integrating Server has DBMS_OUTPUT installed, and you can proceed to step 3. Otherwise, you must install DBMS_OUTPUT. Refer to the Oracle9i Application Developer’s Guide for more information about installing the DBMS_OUTPUT package. After successful installation of the DBMS_OUTPUT package, enter the DESCRIBE statement, as shown previously.

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, use SQL*Plus to connect to the Oracle Integrating Server as the SYS user.
   b. Run the utlpq.sql and prvtpgb.plb scripts in the Oracle Integrating Server C:\orant\rdbms\admin directory. Note that you must run the utlpq.sql script first.

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

      SQL> DESCRIBE HS_FDS_CLASS;

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

      If the DESCRIBE statement does not indicate success, then you must install Heterogeneous Services catalogs, as follows:

      – From SQL*Plus, run the caths.sql script in the Oracle Integrating Server at C:\orant\rdbms\admin directory.

5. Create a public database link to access Oracle Procedural Gateway for APPC, as follows:
a. If necessary, use SQL*Plus to connect to the Oracle Integrating Server as the SYSTEM user.

b. You can use the following SQL*Plus sample whether the Oracle Integrating Server and the gateway reside on the same or a different system.

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

where `pgasrv` is the `tns_name_entry` assigned to the gateway in the `tnsnames.ora` file.

6. Create the gateway administrator user ID PGAADMIN and install the PG DD, as follows:
   a. If necessary, use SQL*Plus to connect to the Oracle Integrating Server as the SYSTEM user.
   b. Run the `pgacr8au.sql` script from the `C:\orant\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 more information, refer to the Oracle9i Server SQL Reference.
   c. Use SQL*Plus to connect to the Oracle Integrating Server as the PGAADMIN user.
   d. Run the `pgddcr8.sql` script from the `C:\orant\pg4appc\admin` directory. This script installs the PG DD.
   e. From SQL*Plus, connect to the Oracle Integrating Server as the SYS user.
   f. Grant execution privileges on DBMS_PIPE to PGAADMIN:

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

Proceed with step 9. Do not perform steps 7 and 8.

**Upgrading the Oracle Integrating Server from Previous Releases**

7. Upgrade Oracle Procedural Gateway for APPC to current version levels, as follows:
   a. Use SQL*Plus to connect to the Oracle Integrating Server as the SYS user.
   b. Run the `prvtrawb.plb` script from the `C:\orant\rdbms\admin` directory to upgrade the UTL_RAW package body.
c. Run the `prvtpgb.plb` script from the `C:\orant\rdbms\admin` directory to upgrade the UTL_PG package body.

If both scripts complete successfully, then continue with Step 8. If they fail because specifications do not exist or were invalidated, then consider reinstalling the package specifications as described in Step 7d.

d. If possible, avoid reinstalling the package specifications. You might have to reinstall the package specifications, however, if the UTL_RAW or UTL_PG package has been invalidated or removed. It is best to avoid reinstalling the package specifications because any dependent objects (such as existing user TIPs) are invalidated and you must recompile them. The Oracle database recompiles automatically as the TIPs are referenced. Because client applications are dependent on TIPs, the client applications subsequently need recompilation also. The impact of this is a one-time performance delay while recompilation of the TIPs and dependent client applications proceeds.

Note: Before proceeding with this step, ensure that you are in the `C:\orant\rdbms\admin` directory.

If you must reinstall the package specifications, run the following two scripts, and then repeat Step 7b and Step 7c above:

- `utlrw.sql` in `C:\orant\rdbms\admin` to upgrade the UTL_RAW package specification
- `utlp_pg.sql` in `C:\orant\rdbms\admin` to upgrade the UTL_PG package specification

When the scripts have run, repeat Steps 7b and 7c.

8. Before executing the new PGAU, upgrade the PG DD, as follows:

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

b. From SQL*Plus, run the `pgdupgr.sql` script from the `C:\orant\rdbms\admin` directory. This script upgrades the PG DD.

Skip steps 9 and 10 and proceed to step 11 if you want to do the optional configuration.
First-Time Installation and Configuration Steps

Perform these steps only if you are installing the gateway for the first time. If you are upgrading, then skip to “Optional Configuration Steps to Permit Multiple Users” on page 4-12.

9. Install the TIP trace access PL/SQL routines. These routines require that the DBMS_PIPEES standard PL/SQL package is installed and that the PGAADMIN user has been granted execute privileges on it. For more information on DBMS_PIPEES, refer to the Oracle9i Server Application Developer’s Guide. To install the TIP trace access PL/SQL routines:

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

   b. From SQL*Plus, run the pgatiptr.sql script from the C:\orant\pg4apppc\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.

10. Install the GPGLOCAL package. This package is required for compilation and execution of all PGAU-generated TIP specifications. TIP developers should be granted execute authorization on GPGLOCAL. Refer to Section 13, "Grant access to PGA required packages" in "Optional Configuration Steps to Permit Multiple Users" for more information. To install the GPGLOCAL package:

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

   b. From SQL*Plus, run the gpglocal.pkh script from the C:\orant\pg4apppc\admin directory. This script compiles the GPGLOCAL package specification.

   c. From SQL*Plus, run the gpglocal.pkb script from the C:\orant\pg4apppc\admin directory. This script compiles the GPGLOCAL package body.

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.

11. 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 the SYSTEM user.

b. From SQL*Plus, run the pgddcr8s.sql script in the C:\orant\pg4appc\admin directory. This script creates public synonyms for the PG DD.

12. Create roles for accessing the PG DD for performing definitions of transactions and for generating TIP specifications. These roles can be granted to other users by the PGAADMIN user as necessary.

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

b. From SQL*Plus, run the pgddcr8r.sql script in the C:\orant\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.

13. 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 C:\orant\rdbms\admin
- **UTL_RAW** in C:\orant\rdbms\admin
- **UTL_PG** in C:\orant\rdbms\admin

Explicit grants to execute these packages must be made to TIP developers. These grants can be private, as in the following example:

```sql
> 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:

```sql
> 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. Either are sufficient for using PGA. Public grants are easier and you can perform them immediately. If you use private grants, you must issue them each time a new TIP developer user ID is created.

SQL scripts for performing these grants are provided in the `C:\orant\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 private grants are to be used, then the `pgddadev.sql` script must be run once for each TIP developer’s user ID.

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

b. From SQL*Plus, run the appropriate script (`pgddapub.sql` or `pgddadev.sql`) from the `C:\orant\pg4appc\admin` directory. The script performs the necessary grants as previously described. 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.

14. 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.
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, a new privilege must be added to the PGDDGEN role. To do this, use SQL*Plus to connect to the Oracle Integrating Server where the PG DD is stored under the PGAADMIN user ID. Then enter the following SQL command:

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

a. Invoke PGAU in the directory path where the PGAU control files are generated and where TIPs are stored.

```
> cd C:\orant\bin
> pgau
PGAU> CONNECT PGAADMIN/PGAADMIN@DATABASE_SPECIFICATION_STRING
PGAU> GENERATE TRANNAME
PGAU> EXIT
```


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

b. Invoke SQL*Plus in the same directory path where the newly-generated TIP specifications are stored, as follows:

```
> 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. Both must be compiled, first the specification and then the body.

Windows Configuration

The following sections describe how to configure Windows for Oracle Procedural Gateway for APPC.

Configuring SNA

Configure the SNA Server to define LU6.2 conversations with the OLTP. Refer to Chapter 6, "Configuring the SNA Communication Package on Windows" for instructions about configuring SNA Server for APPC connections.

Configuring the Gateway

Tailor the Oracle Procedural Gateway for APPC parameters.

Before performing this step, refer to Appendix A, "Gateway Initialization Parameters", for information about tailoring gateway initialization and PGA parameters. Pay special attention to the information about using the PGA_CAPABILITY parameter.

Parameters specific to Oracle Procedural Gateway for APPC are supplied in the gateway parameter file, init$[s]id.ora, which is in the \C:\orant\pg4appc\admin directory. A sample gateway parameter file, initPGA.ora is provided in this subdirectory.

---

**Note:** In the init$[s]id.ora file, substitute your *pg4appc* SID name for "$[s]id" in this file name.

---

The parameters fall into two categories:

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

- PGA parameters
  PGA parameters control the APPC interface portion of the gateway. Use the SET gateway initialization parameter to specify PGA parameters. Oracle Corporation recommends that you group all SET commands for PGA parameters at the end of the init$[s]id.ora file.

If a parameter name is misspelled, then the parameter is disregarded without detecting an error.
Configuring Your Network

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:

   (ADDRESS=
     (PROTOCOL =TCP)
     (HOST=gateway)
     (Port=port)
   )

   (SID_DESC=
     (SID_NAME=PGA)
     (ORACLE_HOME=C:\ORANT)
     (PROGRAM=PG4APPC)
   )

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

2. Add a service name for the gateway to the tnsnames.ora file on the system where your Oracle Integrating Server resides. 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_LIST=
       (ADDRESS= (PROTOCOL = ipc) (KEY=key))
       (CONNECT_DATA= (SID=PGA))
       ((HS=(DRIVER=))))
   )

   In the preceding 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 reside 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_LIST= 
      (ADDRESS=(PROTOCOL= TCP)(Host= gateway)(Port= port))
   )
   (CONNECT_DATA = (SID=PGA))
   (HS=(DRIVER))
)

In the preceding example, \textit{port} is the TCP port defined in the \texttt{listener.ora} file for the TCP protocol and \textit{gateway} is the TCP/IP host name of the system where the gateway resides.

\textbf{Note:} If you are installing a stand-alone gateway, then the Oracle Integrating Server must be defined to PGAU by adding a service name to \texttt{tnsnames.ora} on the system where your gateway resides. For example:

\begin{verbatim}
ora_server =
   (DESCRIPTION= 
      (ADDRESS = 
         (PROTOCOL= TCP)
         (PORT= port)
         (HOST= ora_srv)
      )
      (CONNECT_DATA= (SID= ora_server))
   )
\end{verbatim}

where:

- \texttt{port} is the TCP port defined in the Oracle Integrating Server \texttt{listener.ora} for the TCP protocol
- \texttt{key} is the HOST key
- \texttt{ora_srv} is the TCP/IP hostname of the system where the Oracle Integrating Server resides
- \texttt{ora_server} is the SID of the Oracle Integrating Server

Refer to \textit{Oracle Net Administrator's Guide} for more information about configuring the network.
Configuring Commit-Confirm

If you plan to implement commit-confirm, then refer to "Implementing Commit-Confirm" in the Oracle Procedural Gateway for APPC User's Guide for Windows for more information.

Configuring the OLTP

The steps for configuring your OLTP to communicate with Oracle Procedural Gateway for APPC vary, depending on which OLTP you are using and on which platform the OLTP is running. CICS/ESA, IMS/TM, APPC/MVS, and IDMS-DC MVS are the currently supported OLTPs.

---

**Note:** If this is not a first-time installation for the OLTP, then you do not need to perform the OLTP configuration steps.

---

Configuring CICS/ESA

If your OLTP is CICS/ESA, then perform the following steps to configure CICS and 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 CICS. (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 orapl62.asm file in the C:\orant\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 C:\orant\pg4appc\demo\CICS directory to the MVS system on which you run CICS:
   - dfhcscdup.jcl - the JCL to run CICS DFHCSDUP utility
   - pgaflip.asm - the assembler source for CICS FLIP transaction
   - pgaflip.jcl - the JCL needed to assemble and linkedit CICS FLIP transaction

4. Using the comments in the dfhcscdup.jcl file, tailor the JCL and input statements to match your system setup, and submit it for batch execution. Performing this step updates your CICS 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 linkedits the `pgaflip.asm` file into a load module library accessible to your CICS system through the DFHRPL DD statement in the CICS startup procedure.

6. Log on to your CICS system 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, and it also installs definitions for the sample CICS programs and transactions provided with the gateway.

   The CICS configuration is now complete.

**Configuring IDMS-DC MVS**

If your OLTP is IDMS-DC MVS, perform the following steps to configure IDMS-DC and 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. 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 more information, refer to your 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 `orapl62.asm` file in the `c:\orant\pgappc\sna` directory contains a sample mode entry, including comments that indicate the required values in the mode entry.

4. Using an editor on Windows, modify the Mode Profile to be used for your IDMS-DC connections.

---

**Note:** If your CICS system is not release 3.1.1 or higher, then you must enter the definitions manually using the CICS Resource Definition Online facility.
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, RHDCCNOS.
   
   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 MVS.

   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 C:\orant\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 C:\orant\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 C:\orant\pg4appc\demo\IDMS directory to the MVS system on which you run IDMS-DC:

   - pgaflip.asm - the assembler source for IDMS-DC FLIP program
   - pgaflip.jcl - the JCL needed to assemble and linkedit 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 linkeds 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 MVS for communication with the gateway:

1. Configure your IMS system for the APPC. For APPC/IMS, refer to your vendor documentation.

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 C:\orant\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 C:\orant\pg4appc\demo\IMS directory to the MVS system on which you run IMS/TM:
   - pgaflip.asm - the assembler source for IMS FLIP transaction
   - pgaflip.jcl - the JCL to assemble and linkedit the IMS FLIP transaction
   - imsgen.asm - the 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, this might require you 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 oraplu62.asm file in the C:\orant\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 MVS system where the sample files will be placed. The PDS should be allocated with RECFM=FB, LRECL=80, and a BLKSIZE appropriate for the device type on which it resides. Approximately two tracks of 3390 disk space are required with one directory block. Oracle Corporation suggests naming this partitioned dataset (PDS) ORAPGA.APPCMVS.SAMPLIB.

4. Transfer the following files from the C:\orant\pg4appc\demo\MVS directory to the MVS PDS you allocated in the previous step, using the specified member names:

   - pgaflip.jcl is the JCL to add an APPC/MVS TP profile and to define the execution environment for the transaction. Store this file in your MVS PDS as member PGAFLIPJ
   - pgaflip.rex is the REXX source needed for the APPC/MVS PGAFLIP transaction. Store this file in your MVS PDS as member PGAFLIP.

5. Using the comments in the pgaflip.jcl file, tailor the JCL to match the 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 the dataset name in the JCL is changed to match the name of the MVS PDS allocated in Step 3.

The APPC/MVS configuration is now complete.
Verifying the Installation

Before verifying the installation of the gateway components, be sure that the SNA Server is configured correctly. Refer to Chapter 6, "Configuring the SNA Communication Package on Windows" for information about configuring the SNA Server. Check with your network administrator if you have SNA issues.

To verify the gateway installation and the OLTP configuration, perform the following procedures after installing Oracle Procedural Gateway for APPC.

Verifying the Gateway Installation

**Note:** If the database link name is not PGA, you must modify the demo .sql files to give them the particular database link name that you created in Step 5 of "Configuring the Oracle Integrating Server for First-Time Installations" on page 4-8. You must modify the following .sql files:

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

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

1. Using SQL*Plus, connect to your Oracle Integrating Server from the client system as the PGAADMIN user.

2. Run C:\orant\pg4appc\demo\pgavsn.sql.
   
   The server version number banner appears at your terminal.

3. Run C:\orant\pg4appc\demo\pgaecho.sql.
   
   The following message appears:
   
   ```
   ==> Congratulations, your installation was successful. <==
   ```
Verifying the OLTP Configuration

The procedure for verifying your OLTP configuration varies, depending on which OLTP you are using and depending on which platform the OLTP is running. CICS/ESA, IMS/TM, APPC/MVS, and IDMS-DC MVS are the currently supported OLTPs.

CICS Verification

If your OLTP is CICS/ESA, perform the following steps to verify the CICS configuration:

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

   \[ flip \]

   The following output appears:

   \[ EGASSEM SIHT pilf \]

2. Log on to Windows and make the C:\orant\pg4appc\demo\CICS directory your current directory.

3. Transfer the pgacics.sql file to the client system from which you access the Oracle Integrating Server. If the clients are local to the Oracle Integrating Server, then this step is not necessary.

4. Modify the pgacics.sql file. Customize the following three items used for accessing the gateway and the CICS system, as described in the comments at the beginning of the file:

   - the CICS transaction ID
   - the side profile name
   - the logmode entry name

5. Ensure that the SNA connection on Windows has been started using SNA Server Manager.

6. Log on to your CICS system and enter this transaction:

   \[ CEMT SET CONNECTION(name) ACQUIRED \]

   where: name is the name of the CONNECTION definition installed by the DFHCSDUP job you ran in the CICS configuration steps.
Verifying the Installation

This transaction activates the CICS connection to Windows.

7. Using SQL*Plus, connect to your Oracle Integrating Server from the client system.

8. Run `pgacics.sql`.
   
The following message appears:
   
   ```
   ==> Congratulations, your gateway is communicating with CICS ===
   ```

Your CICS installation verification is complete.

**IDMS-DC Verification**

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

1. Log on to Windows and change directory to `C:\orant\pg4appc\demo\IDMS`.

2. Transfer the `pgaidms.sql` file to the client system from which you access the gateway. If the clients are local to the Oracle Integrating Server, then this step is not necessary.

3. Modify the `pgaidms.sql` file. 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

4. Ensure that the SNA connection on Windows has been started using SNA Server Manager.

5. Using the IDMS-DC DCMT transaction, display the LU6.2 line to check that sessions have been started with Windows. The command is:

   ```
   DCMT DIS LINE linename
   ```

   where `linename` is the name of the LINE defined for LU6.2 communications with Windows. Each defined L-TERM/P-TERM should show a status of INSRV. Any other status indicates a problem with the IDMS-DC APPC interface.

6. Using SQL*Plus, connect to the Oracle Integrating Server.

7. Run `pgaidms.sql`.
The following message appears:

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

The IDMS-DC installation verification is now complete.

**IMS/TM Verification**

If your 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 your IMS/TM system and enter the following transaction (replacing `flip` with the transaction ID you chose for FLIP when you configured your IMS/TM system for the gateway.

   `flip` THIS MESSAGE

   The following output should appear on your terminal:

   EGASEM SIHT

2. Log on to Windows and change directory to `C:\orant\pg4appc\demo\IMS`.

3. Transfer the `pgaims.sql` file to the client system from which you access the gateway. If the clients are local to the Oracle Integrating Server, then this step is not necessary.

4. Modify the `pgaims.sql` file. 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

5. Ensure that the SNA connection on Windows has been started using SNA Server Manager.

6. Using SQL*Plus, connect to the Oracle Integrating Server from the client system.

7. Run `pgaims.sql`.

   The following message appears:

   ===> Congratulations, your gateway is communicating with IMS/TM <==
Your IMS/TM installation verification is now complete.

**APPC/MVS Verification**

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

1. Verify that the APPC/MVS subsystem is active.
2. Log on to the Windows system where the gateway is installed and make the `C:\orant\pg4appc\demo\MVS` directory your current directory.
3. Transfer the `pgamvs.sql` file to the client system from which you access the gateway. If the clients are local to the Oracle Integrating Server, then this step is not necessary.
4. Modify the `pgamvs.sql` file. 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
5. Ensure that the SNA connection on Windows has been started using SNA Server Manager.
6. Using SQL*Plus, connect to the Oracle Integrating Server from the client system.
7. Run `pgamvs.sql`.
   
   The following message appears:
   
   `=> Congratulations, your gateway is communicating with APPC/MVS <=`

The APPC/MVS installation verification is now complete.

**Performing Post-Installation Procedures**

You can perform the following optional steps as necessary. Oracle Corporation recommends that you install the sample applications for OLTP to help you to understand fully how the gateway works and how it interfaces with OLTP.
Installing Sample Applications

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

APPC/MVS
- list MVS dataset information

CICS/ESA
- ADABAS inquiry
- DB2 inquiry
- DB2 multi-row inquiry
- DB2 update
- VSAM inquiry
- VSAM update
- DLI inquiry
- FEPI DB2 inquiry
- FEPI VSAM inquiry

IDMS-DC MVS
- 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 will be added to the distribution media in later releases of the product. Where 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.wri files in the C:\orant\pg4appc\demo CICS, IMS, MVS, and IDMS directories.
Accessing the Gateway from Other Oracle Servers

To access Oracle Procedural Gateway for APPC from other Oracle servers, perform the following steps:

1. Set up the Oracle Integrating Server with local or Oracle Net access to the Oracle Procedural Gateway for APPC.
2. Create a database link from the Oracle Integrating Server to the gateway, as described in "Configuring the Oracle Integrating Server for First-Time Installations" on page 4-8.
3. Ensure that the UTL_RAW, UTL_PG, and DBMS_OUTPUT PL/SQL packages are installed on the Oracle Integrating Server.

Accessing Other OLTPs from the Oracle Integrating Server

To access other OLTPs from the Oracle Integrating Server, perform the following steps:

1. Configure another APPC definition set for the OLTP as described in Chapter 6, "Configuring the SNA Communication Package on Windows".
   Only side information and remote LU definitions must be new. You can point to existing configuration information for other definitions unless you need to modify other aspects of the connection. For example, if you are using a different network hardware adapter, you must configure an entire APPC definition set.
2. Configure the additional OLTP, as described in "Configuring the OLTP" on page 4-19.

Deinstalling Your Oracle Procedural Gateway for APPC

If you decide to deinstall your Oracle Procedural Gateway for APPC, 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 the PGAADMIN user.
   b. From SQL*Plus, run the pgdddel.sql script from the C:\orant\pg4appc\admin directory.
2. Insert the gateway product CD-ROM into your CD-ROM drive.
3. Start the Oracle Universal Installer by running the Oracle Universal Installer executable, setup.exe:
   a. From the Start Menu, select run.
   b. 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 the following table as a guide for deinstallation, following the instructions in the "Response" column.

<table>
<thead>
<tr>
<th>Prompt</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Oracle Universal Installer</td>
<td>Click &quot;Deinstall Products ...&quot;.</td>
</tr>
<tr>
<td>2. Inventory</td>
<td>Check &quot;Oracle Procedural Gateway for APPC 9.2.0.1.0&quot; and click &quot;Remove&quot;.</td>
</tr>
<tr>
<td>3. Confirmation</td>
<td>Click &quot;Yes&quot;.</td>
</tr>
<tr>
<td>4. Inventory</td>
<td>Click &quot;Close&quot;.</td>
</tr>
<tr>
<td>5. Oracle Universal Installer</td>
<td>Click Exit&quot;.</td>
</tr>
<tr>
<td>6. Exit</td>
<td>Click &quot;Yes&quot;.</td>
</tr>
</tbody>
</table>

5. Oracle Procedural Gateway for APPC is deinstalled. When the Oracle Universal Installer confirms that the deinstallation has ended, verify that the deinstallation procedure was successful. To do this, read the contents of the deinstallation log file, which is located in the C:\Program Files\Oracle\Inventory\log directory. The default file name is InstallActions.log.

6. The only files that are removed are those that were copied to the Oracle home directory (for example: c:\orant) during the installation of Oracle Procedural Gateway for APPC. You must remove any other related files manually, including the listener.ora and tnsnames.ora entries relating to the gateway, dropping database link(s) and the PGAADMIN user ID and deleting the TIPs.
The gateway architecture involves multiple computer systems, database servers, and communications facilities, each having distinct security capabilities and limitations. You must understand these capabilities and limitations to plan effectively and implement security.

Read this chapter to learn about the capabilities and limitations of the Oracle Procedural Gateway for APPC. It contains the following sections:

- Overview of Security Requirements on page 5-2
- Authenticating Application Logons on page 5-2
- Defining and Controlling Database Links on page 5-3
- Passwords in the Gateway Initialization File on page 5-5
Overview of Security Requirements

Before implementing your security scheme, you must understand the existing security requirements and expectations in your 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 several 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 given gateway instance and OLTP (online transaction processor)
- 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 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 given 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 both Oracle and non-Oracle products.

Authenticating Application Logons

An application must connect to an Oracle Integrating Server before using Oracle Procedural Gateway for APPC. 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:

- 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.

- 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 forward slash (/) for a user ID and does not supply a password.

To perform operating system authentication, the server determines the requester 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 Windows-specific Oracle server documentation and the Oracle Net Administrator's Guide to determine the availability of this feature in your configuration.

For more information about authenticating application logons, see the Oracle9i Administrator's Guide.

Defining and Controlling Database Links

The following sections describe the security attributes of database links.

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. Only the user who creates a private database link can use 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 versus update or write) or which remote objects can be accessed. These distinctions are the responsibility of the OLTP that is accessed.
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 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, see the Oracle9i Administrator’s Guide.
Passwords in the Gateway Initialization File

Oracle Procedural Gateway for APPC uses user IDs and passwords to access the information on the remote database on the gateway server. To handle functions, some user IDs and passwords must be defined in the gateway initialization file. (For an example, refer to the PGA_LOG_PASS parameter in Appendix A.) Because having plain text passwords accessible in the initialization file is not secure, a new encryption feature, pg4pwd, has been added to the gateway. With this feature, passwords are no longer stored in the initialization file but are stored instead in an encrypted form in the password file, thus making the information more secure. The pg4pwd utility is an optional feature, but Oracle Corporation strongly recommends that you use it. The following section describes how to use it.

Using the pg4pwd Utility

Use the pg4pwd utility to encrypt passwords that are normally stored in the gateway initialization file. The pg4pwd utility searches the initialization file for parameters with an asterisk (“*”). An asterisk denotes that the parameter value is stored in encrypted form in another file.

The following is a sample section of the initialization file with this value:

```
SET PRIVATE PGA_LOG_PASS=*  
```

To use the pg4pwd utility:

1. Edit the initialization file to set parameter values to “*”.
2. Run the pg4pwd utility, specifying the gateway SID on the command line. The utility reads the initialization file, and prompts you to enter the values to encrypted.

   The syntax of the command, where `gateway_sid` is the SID of the gateway is:

   ```
   C:\orant\bin> pg4pwd gateway_sid  
   ```

   For example, if the gateway SID is PGA, enter:

   ```
   C:\orant\bin> pg4pwd PGA  
   ORACLE Gateway Password Utility (pg4appc)
   Constructing password file for Gateway SID PGA
   Enter the value for PGA_LOG_PASS
   pgaadmin
   ```

   In the preceding example, the PGA_LOG_PASS parameter is identified as requiring encryption. The user enters the value pgaadmin and presses enter. If there are
more parameters requiring encryption, they are prompted for in turn. The encrypted data is stored in the C:\orant\pg4appc\admin\init\sid.pwd directory.

**Note:** You need to set the ORACLE_HOME environment variable through Oracle Selector to the correct gateway Oracle home directory to ensure that the correct gateway initialization file is read.
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 Windows is provided by the SNA Server product. Though Microsoft Host Integration Server replaces Microsoft SNA Server, it retains the same configuration, and so the steps for configuring SNA Server also apply to Host Integration Server.

Read this chapter to learn how to configure Microsoft SNA Server on a Windows system to run Oracle Procedural Gateway for APPC. Optionally, users can choose to use the IBM Communications Server, Version 5.01 or 6.01 for Windows.

This chapter contains the following sections:

- Using SNA Security Validation on page 6-2
- Specifying SNA Conversation Security on page 6-2
- Processing Inbound Connections on page 6-3
- Configuring MS SNA on page 6-3
- Configuring IBM Communications Server on page 6-21
- Testing the Connection on page 6-26
Using SNA Security Validation

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 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 profiles and in similar parameter structures in the OLTP to be accessed. Refer to the appropriate communications software product documentation for detailed information about this subject.

Specifying SNA Conversation Security

The PGA_SECURITY_TYPE parameter of the gateway initialization file allows you to specify either 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.

SNA Security Option SECURITY=NONE

If PGA_SECURITY_TYPE=NONE is specified, then the gateway performs no processing of the client user ID and password. The conversation is allocated with SNA option SECURITY=NONE.

SNA Security Option SECURITY=PROGRAM

If PGA_SECURITY_TYPE=PROGRAM is specified, 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/ESA 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.

**Processing Inbound Connections**

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

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

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

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

**Configuring MS SNA**

The following sections describe how to configure MS SNA.

**Independent Versus Dependent LUs**

Oracle Corporation recommends independent LUs for the Oracle Procedural Gateway for APPC because they support multiple parallel sessions or conversations. This means 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 Procedural Gateway server behind an already active conversation. In other words, conversations are single-threaded for dependent LUs. If a dependent LU is correctly defined, 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 only uses a single conversation or transaction at any one time, there should be no impact.

However, additional concurrent conversations or transactions might be required for testing or 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 which initiates the conversation must specify the different Partner LU through a different Side Information Profile or by overriding the LU name. See PGAU DEFINE TRANSACTION SIDEPROFILE and LUNAME parameters in Chapter 3, "Procedural Gateway Administration Utility," in the Oracle Procedural Gateway for APPC User’s Guide for Windows.

Creating SNA Definitions for the Gateway
SNA Server definitions can be created and modified in two ways:

- directly with the SNACFG command
- using menus in SNA Server Manager

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

Sample SNA Server Definitions
The C:\orant\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 SNA Server Manager session.

You can create and modify the definitions in two ways:

- 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 this method you must use SNA Server Manager to review and modify the installed definitions. Because of configuration and naming differences, it is unlikely they will work without modification.

- create the definitions

  SNA Server Manager 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 for the gateway.

**Definition Types**

There are several types of SNA Server definitions relevant to gateway APPC/LU6.2 operation. Each definition can be created and edited using a corresponding 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 profiles.

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

**SNA Server Definitions**

This section describes the process of creating your SNA definitions for SNA Server Version 3 using SNA Server Manager. All of the tasks described in this section are performed from within SNA Server Manager.

The other primary administration tool is the SNA Server Management Console. Both tools provide access to the same SNA definitions for the node, but in slightly different views. The SNA Server Manager gives a localized view of the Node, while
the SNA Server Manager Console presents a more global view where the local Node can be one of many SNA Nodes in a network, managed by this system. Later versions of SNA Server and Host Integration Server tools might reorganize the profiles placement in the definition tree, but the concepts are the same.

**Server Selection**

Select the appropriate 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. (Refer to Figure 6–1).

*Figure 6–1  SNA Server Manager Window - Select SNA Service*
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 the [Add] button. 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 vary depending on which Link Service was selected. In this example, the DLC 802.2 Link Service Properties dialog is used. (Refer to Figure 6–3).

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

Select the appropriate network adapter from the Adapter drop-down menu and click [OK]. From the Insert Link Service dialog box, click the [Finish] button. The system now updates your network bindings.
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
Select the Address tab. Enter the Remote Network Address and the Remote SAP address. (Refer to Figure 6–5).

Figure 6–5  Enter Remote Address
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 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, do so now. Now all of the connection properties are set. Click the [OK] button to continue. (Refer to Figure 6–7).

**Figure 6–7  Select DLC**
Local LU Definition
You must create a local LU definition. The local LU definition describes the SNA LU through which the gateway communicates with OLTP systems.

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

Select the General tab. Enter the LU Alias, Network Name and LU Name. Be sure the APPC Syncpoint Support box is not checked. (Refer to Figure 6–8).

Figure 6–8  Select APPC Local LU - Enter General LU Properties
Select the Advanced tab. Check the Member of Default Outgoing Local APPC LU Pool box. Set the LU 6.2 Type to Independent to allow parallel sessions. (Refer to Figure 6–9).

**Figure 6–9  Select Local LU Advanced Tab**

Now the Local LU properties are all set. Click [OK] to continue.
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. 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 remote transaction program invocations 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 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).

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

![APP Mode Properties](image)

Now all of the APPC mode properties are set. Click the [OK] button to continue.
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 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 box. Use the Implicit Incoming Mode drop-down menu to select the mode. Set any security options you need. (Refer to Figure 6–14).

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

The remote APPC LU properties are now set. Click [OK] to continue.
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 pull-down menu, select the appropriate 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, you can enter a dummy TP name at this time. The TP name is over-ridden by the gateway at execution time.

Enter the Partner LU Name alias. (Refer to Figure 6–16).

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

Click the [OK] button to save the Side Information.

**Configuring IBM Communications Server**

The following sections describe how to configure IBM Communications Server.

**Independent Versus Dependent LUs**

Oracle Corporation recommends independent LUs for 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 gateway server through the independent LU.

Dependent LUs support only a single active session. The CP (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 gateway with the gateway server. While that session is active (which could be seconds, minutes, or 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 other application development. Each requires that additional dependent LUs be defined on the remote host, plus additional IBM Communications Server configuration entries which define the additional dependent LUs on the host.

Additional Side Information Profiles should be defined to use the new dependent LUs. New Oracle Procedural Gateway for APPC instances should be created and configured to use these new Side Information Profiles.

**Creating SNA 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.

**Definition Types**

There are several types of IBM Communications Server definitions 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 profiles.
Refer to the IBM Communications Server online documentation for a complete discussion of IBM Communications Server definitions. This section is an overview of IBM Communications Server definitions in relation to Oracle Procedural Gateway for APPC.

**IBM Communications Server Definitions**

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

**Creating the Configuration**

SNA Node Configuration will first ask 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.

**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 on Node.
2. Click the [Create] button.
3. In the Define the Node dialog box under 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].

**Creating Devices**

Configure Communication Devices next. To configure Communication Devices:

1. Click on Devices.
2. Click the [Create] button.
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.

Configuring a LAN Device
Configure a LAN device next. To configure a LAN device:
1. In the Basic tab, select the Adapter to use and the Local SAP.
   The other tabs provide options on network tuning parameters.
2. Click [OK].

Creating Peer Connections
Configure peer connections next. To configure peer connections:
1. Click on Peer Connections.
2. Click the [Create] button.

Defining the Link Station
Define the link station next. To define the link station:
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.

Defining the Adjacent Node
Define the Adjacent Node next. To define the Adjacent Node:
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].

Creating Local LUs
Create Local LUs for this node next. To create Local LUs:
1. Click on Local LU 6.2 LUs.
2. Click the [Create] button.

**Defining Local LUs**
Define Local LUs next. To define Local LUs:
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].

**Create Partner LUs**
Create remote Partner LUs for this node to connect to next. To do this:
1. Click on Partner LU 6.2 LUs.
2. Click the [Create] button.

**Defining Partner LUs**
Define partner LUs next. To define partner LUs:
1. In the Basic tab, enter the name of the Remote or Partner LU, and optionally, an alias.

2. Choose the Fully Qualified CP from the Existing list.
   
   You can examine the other tab for logical record limits and security support.
3. Click [OK].

**Creating the CPI-C Side Information Profile**
Next, define the CPI-C profile that will be used to create the gateway. To do this:
1. Click on the CPI-C Side Information Definitions.
2. Click the [Create] button.
Before proceeding with the gateway configuration tasks in Chapter 4, "Installing and Configuring the Gateway", ensure that your connection is working. You can do this using SNA Server Manager.

Figure 6–17, "Relationship Between SNA Server Definitions and Host VTAM" 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
Migrating to new instances of Oracle Procedural Gateway for APPC from an existing installation is straightforward if you follow some guidelines. This chapter provides information to make these new installations as simple as possible. It contains the following sections:

- Migrating An Existing Gateway Instance to New Release on page 7-2
- Backout Considerations When Migrating to New Releases on page 7-3
- Parameter Changes for Version 4 to Release 9i Migration of Gateway on page 7-3
- Oracle Net Considerations on page 7-6
Migrating An Existing Gateway Instance to New Release

Follow these steps to migrate an existing gateway to Oracle Procedural Gateway for APPC, Release 9.2.0.1.0.

Step 1: Install the new Release
Install the new release of the Gateway in a separate directory as outlined in Chapter 4, "Installing and Configuring the Gateway".

Caution: Do not install the Gateway over an existing Gateway installation. Doing so will corrupt that existing installation.

Step 2: Transferring init sid.ora Gateway Initialization File Parameters
Copy the init sid.ora file from the old Gateway instance to the new instance. PGA_TRACE is not supported by Oracle Procedural Gateway for APPC Release 9.2.0.1.0, so use TRACE_LEVEL instead.

Note: If you use TRACE_LEVEL, you must set the path for the parameter LOG_DESTINATION.
Backout Considerations When Migrating to New Releases

Oracle Corporation recommends that you keep the old gateway home 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.

Parameter Changes for Version 4 to Release 9i Migration of Gateway

This release of Oracle Procedural Gateway for APPC introduces new and changed initialization parameters if you are migrating from a Version 4 gateway to Oracle9i. The following section lists new parameters relevant to migration from Version 4 gateways.

New Gateway Initialization Parameters

The new parameters listed below are in the gateway initialization file (initsid.ora):

- FDS_CLASS
- FDS_INSTANCE
- HS_RPC_FETCH_REBLOCKING
- HS_FDS_FETCH_ROWS
- HS_RPC_FETCH_SIZE
- HS_NLS_NCHAR
- LOG DESTINATION
- TRACE_LEVEL

Note: The “HS_” parameters are specific to Oracle Heterogeneous Services. For details on HS parameters, refer to Oracle9i Distributed Database Systems.
Renamed Gateway Initialization File Parameters

Table 7–1 lists the gateway initialization file (initsid.ora) parameters that have been renamed in this release of the gateway; it also lists their previous names.

<table>
<thead>
<tr>
<th>New Name</th>
<th>Old Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>HS_COMMIT_STRENGTH_POINT</td>
<td>COMMIT_STRENGTH_POINT</td>
</tr>
<tr>
<td>HS_DB_DOMAIN</td>
<td>DB_DOMAIN</td>
</tr>
<tr>
<td>HS_DB_INTERNAL_NAME</td>
<td>DB_INTERNAL_NAME</td>
</tr>
<tr>
<td>HS_DB_NAME</td>
<td>DB_NAME</td>
</tr>
<tr>
<td>HS_DESCRIBE_CACHE_HWM</td>
<td>DESCRIBE_CACHE_HWM</td>
</tr>
<tr>
<td>HS_LANGUAGE</td>
<td>LANGUAGE</td>
</tr>
<tr>
<td>HS_NLS_DATE_FORMAT</td>
<td>NLS_DATE_FORMAT</td>
</tr>
<tr>
<td>HS_NLS_DATE_LANGUAGE</td>
<td>NLS_DATE_LANGUAGE</td>
</tr>
<tr>
<td>HS_OPEN_CURSORS</td>
<td>OPEN_CURSORS</td>
</tr>
<tr>
<td>HS_ROWID_CACHE_SIZE</td>
<td>ROWID_CACHE_SIZE</td>
</tr>
</tbody>
</table>

Obsolete Parameters

The following parameters are now obsolete. You must remove them from the configuration files:

- MODE
- SERVER_PATH
- ERROR_LOGGING
- ERROR_REPORTING
- ERRORTAG
- GATEWAY_SID
- GROUP_BY_OFF
- GTWDEBUG
- IFILE
Migrating from Version 9.0.1.1.1 to 9.2.0.1.0

- 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

New Parameter Added When Migrating from Version 8 or Earlier to Oracle9i Gateway

You must add the following startup shell script parameter to the `initSID.ora` file if you are migrating from a Version 4 or Version 8 gateway to release 9i of Oracle Procedural Gateway for APPC:
- FDS_CLASS_VERSION

Migrating from Version 9.0.1.1.1 to 9.2.0.1.0

You do not have to do anything, there are no new parameters added since release 9.0.1.1.1.
Oracle Net Considerations

The gateway uses the Heterogeneous Services (HS) facilities of Oracle and Oracle Net. Consequently, you must modify the gateway service name entries in the tnsnames.ora file to tell Oracle Net that the gateway uses the HS facilities.
This appendix describes the gateway initialization file location and lists the gateway initialization parameters that are supported by Oracle Procedural Gateway for APPC. These parameters are documented fully in Chapter 7, "Migration and Coexistence with Existing Gateways". This appendix contains the following sections:

- Gateway Initialization Parameter File on page A-2
- PGA Parameters on page A-2
- PGA_CAPABILITY Parameter Considerations on page A-6
- PGA_CONFIRM Parameter Considerations on page A-8
Gateway Initialization Parameter File

The parameter file for Oracle Procedural Gateway for APPC is located in the C:\orant\pg4appc\admin directory and is called init_sid.ora.

PGA Parameters

The PGA parameters control the APPC interface portion of the gateway.

PGA parameters are supplied using the SET gateway initialization parameter, as in the following example:

\texttt{SET pga\_parm=value}

where \texttt{pga\_parm} is one of the PGA parameter names in the list that follows, and \texttt{value} is a character string with contents that depend on \texttt{pga\_parm}.

Table A–1 provides a list and description of PGA parameters.

\textbf{Note:} Other parameters can be added to this file. Refer to "Parameter Changes for Version 4 to Release 9i Migration of Gateway" in Chapter 7, "Migration and Coexistence with Existing Gateways" for more information.

\textbf{Note Also:} Mis-spelled gateway parameters are ignored.

<table>
<thead>
<tr>
<th>Parameter Description</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>\texttt{LOG_DESTINATION=logpath}</td>
<td>logpath specifies the destination at which stderr is reopened. LOG_DESTINATION specifies a directory only and stderr is reopened to logpath\sid_pid.log where: \texttt{sid} is the sid name, and \texttt{pid} is the process ID assigned to the gateway</td>
</tr>
</tbody>
</table>
PGA Parameters

Gateway Initialization Parameters

Table A–1 PGA Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGA_CAPABILITY</td>
<td>PGA transaction capability. This controls whether updates are allowed through the gateway. The following are valid values: READ_ONLY or RO - read-only capabilities. 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. COMMIT_CONFIRM or CC - 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. The default is SINGLE_SITE.</td>
</tr>
<tr>
<td>PGA_CONFIRM</td>
<td>Incoming APPC CONFIRM request handling option. This controls what the gateway does when an APPC CONFIRM request is received from the remote transaction program. This parameter has meaning only when the conversation is running with SYNCLEVEL &gt; 0. The following values are valid: ACCEPT - respond to incoming APPC CONFIRM requests with APPC CONFIRMED responses. REJECT - treat incoming APPC CONFIRM requests as errors causing the conversation to be de-allocated and an error message to be issued. The default is REJECT.</td>
</tr>
<tr>
<td>PGA_LOG_DB</td>
<td>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 is set to COMMIT CONFIRM. There is no default value.</td>
</tr>
</tbody>
</table>
PGA Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGA_LOG_PASS</td>
<td>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 is set to COMMIT_CONFIRM. For more information, refer to “Using the pg4pwd Utility” on page 5-5. There is no default value.</td>
</tr>
<tr>
<td>PGA_LOG_USER</td>
<td>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 is set to COMMIT_CONFIRM. There is no default value.</td>
</tr>
<tr>
<td>PGA_RECOVERY_PASS</td>
<td>The password 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 is set to COMMIT_CONFIRM and PGA_SECURITY_TYPE is set to PROGRAM. For more information, refer to “Using the pg4pwd Utility” on page 5-5. There is no default value.</td>
</tr>
<tr>
<td>PGA_RECOVERY_TPNAME</td>
<td>The TP name of the transaction installed in the OLTP for commit-confirm FORGET and RECOVERY processing. The TP name can be from 1 to 64 characters long. For CICS/ESA, the TP name is limited to 4 characters. For IMS/TM, the TP name is limited to 8 characters. Other OLTPs might have other limits on the length of the TP name. This parameter is required only when PGA_CAPABILITY is set to COMMIT_CONFIRM. The default value is RECO.</td>
</tr>
</tbody>
</table>
## Table A–1  PGA Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGA_RECOVERY_USER</td>
<td>The user ID 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 is set to COMMIT_CONFIRM and PGA_SECURITY_TYPE is set to PROGRAM or SAME. There is no default value.</td>
</tr>
<tr>
<td>PGA_SECURITY_TYPE</td>
<td>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 PROGRAM - which sends a user ID and password The default is NONE. For more information on these options, refer to &quot;Using SNA Security Validation&quot; on page 6-2.</td>
</tr>
<tr>
<td>TRACE_LEVEL</td>
<td>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.</td>
</tr>
</tbody>
</table>

### Sample Gateway Initialization File

```sql
#******************************************************************************
#
# SAMPLE initPGA.ora file for PG4APPC for NT
#
#
#******************************************************************************

# FDS_CLASS=PG4APPC_9I
FDS_CLASS_VERSION=2
FDS_INSTANCE=PGA
#SET TRACE_LEVEL=255
```
PGA Parameters

#SET LOG_DESTINATION=C:\ORANT\pg4appc\log
#  HS_COMMIT_POINT_STRENGTH=255
HS_DB_NAME=PGA
HS_DB_DOMAIN=WORLD
HS_DB_INTERNAL_NAME=504741
#  SET PGA_CAPABILITY=SINGLE_SITE
SET PGA_SECURITY_TYPE=NONE
SET PGA_SIGDANGER=IGNORE

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 remote transaction programs are doing.

Use the READ_ONLY setting when the remote transaction programs are read-only; that is, when the remote transaction programs perform no database updates. Do not use READ_ONLY when the remote transaction programs perform database updates. For example, if the READ_ONLY setting is chosen, and if a remote transaction program invoked by the gateway performs updates to a foreign database, then the Oracle Integrating Server does not provide any integrity protection for those updates. Furthermore, READ_ONLY mode allows a gateway transaction to be part of a distributed transaction that might update several other databases. If the gateway invokes a remote transaction program that performs updates in this situation, and if a failure occurs, then the database updated by the remote transaction program is out of sync with the other databases.

In cases where the remote transaction programs 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 allowing COMMIT and ROLLBACK requests to be forwarded to the remote transaction program, 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 remote transaction programs and on the capabilities of the OLTP (online transaction processor) where they execute.
If the OLTP has only LU6.2 SYNCELEVEL 1 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 remote transaction program 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. For SINGLE_SITE capability, the remote transaction program is responsible for performing the appropriate 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, the remote transaction program must perform COMMIT processing and then respond to the gateway with an APPC CONFIRMED response. On receipt of a SEND_ERR, the remote transaction program 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 remote transaction program, 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 remote transaction programs which perform updates to foreign databases outside the scope of the Oracle Integrating Server’s control. 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, you can use a COMMIT_CONFIRM gateway, provided that the OLTP and the remote transaction programs 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), perform the following:

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.

**PGA_CONFIRM Parameter Considerations**

When deciding on 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 appropriate 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. 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 6. When using the “implied APPC” support that is provided by IMS/TM version 6, 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 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.
Windows-Specific Gateway Messages

This appendix describes the gateway messages specific to Windows. It contains the following section:

- Oracle Procedural Gateway for APPC Server Messages on page B-2
Oracle Procedural Gateway for APPC Server Messages

Note: If you are using IBM Communications Server, the error message numbers and return code numbers you get are different from those listed in Table B–1. Refer to the winpic.h file for more information about error message numbers.

PGA-20910 communication error: CPI-C func failed, rc = rc, errno = errno

Cause: An unexpected communication error occurred while executing the specified CPI-C function func. The CPI-C function return code rc and system error number errno are provided in the message text. The CPI-C function return codes are described in vendor documentation. Also, the CPI-C return codes are contained in the C:\bkoffice\include\winpic.h header file. The system error number is meaningless for SNA Server on Windows and is usually zero.

Table B–1 lists some commonly received rc/errno combinations, and their possible causes:

<table>
<thead>
<tr>
<th>rc</th>
<th>errno</th>
<th>Possible Cause(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>Either the target LU name is not defined on the target system, or the mode name is not defined on the target system.</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>A security violation occurred on the target system; either the user ID or password is not valid on that system or the user ID is not authorized to execute the requested transaction.</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
<td>The transaction program requested is not defined to the target LU.</td>
</tr>
<tr>
<td>10</td>
<td>0</td>
<td>The transaction program requested is defined to the target LU, but could not be found.</td>
</tr>
<tr>
<td>17</td>
<td>0</td>
<td>The transaction program terminated abnormally on the target LU, or issued a DEALLOCATE_ABEND.</td>
</tr>
<tr>
<td>19</td>
<td>0</td>
<td>The target LU is not active or has not established communications with SNA Server.</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
<td>Either the target LU name or alias is not defined locally to SNA Server, or the mode name is not defined locally to SNA Server.</td>
</tr>
</tbody>
</table>

Action: Determine the cause of the communications error, correct it, and rerun the transaction.
This appendix provides a summary of changes for previous versions of Oracle Procedural Gateway for APPC.

This appendix contains the following sections:

- Changes and Enhancements in Previous Releases on page C-2
- Corrected Problems in Previous Versions on page C-6
- Known Problems in Previous Versions on page C-9
Changes and Enhancements in Previous Releases

The following sections list changes and enhancements in previous releases of the gateway.

Release 9.0.1.1.0

The following sections describe the changes and enhancements in release 9.0.1.1.0.

Oracle Server Dependencies

Release 9.0.1.1.0 of Oracle Procedural Gateway for APPC requires an Oracle9i release 9.0.1.1.0 (Oracle9i database server release 9.0.1) or higher Oracle Integrating Server.

Oracle Home Directory

If you are installing Procedural Gateway for APPC release 9.0.1.1.1 on the system for the first time, the ORACLE_HOME directory is C:\orant, by default.

PG4APPC and PGAU

In this release of Oracle Procedural Gateway for APPC for Windows, the following names have changed:

- PG4APPC80.EXE (known as PG4APPC80) has been changed to PG4APPC.EXE (known as PG4APPC).
- PGAU80.EXE (known as PGAU80) has been changed to PGAU.EXE (known as PGAU).

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, you must remove this parameter.

FDS_CLASS_VERSION Parameter Added

You must add the FDS_CLASS_VERSION parameter to the Procedural Gateway for APPC initialization file (initsid.ora). A default value is specified in the initsid.ora file.
Release 4.0.1.1.0

The following sections provide information on changes to release 4.0.1.1.0.

**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 (online transaction processor) to be specified by the user. For complete information on 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 install process.

Release 8.0.6.0.0
The 8.0.6.0.0 release of the Oracle Procedural Gateway for APPC contains the following changes and enhancements.

Changes
Components of the Oracle Procedural Gateway for APPC are now based on Oracle8 release 8.0.6.0.0 (the Oracle Integrating Server).

The Oracle Procedural Gateway for APPC for Windows NT does not support Oracle7 server or earlier.

Oracle Server Dependencies
This release of the Oracle Procedural Gateway for APPC requires the Oracle Integrating Server to be an Oracle8 Server, release 8.0.6.0.0 or higher.

Gateway Initialization Parameters
In previous releases of the gateway the initialization parameters were stored in files named initSID.gtwboot and initSID.ora, both found in the gateway instance directories. With release 8, most parameters that were in the initSID.gtwboot file have been moved to the initSID.ora file. The syntax of the initSID.ora file has been simplified. When migrating from previous releases of the Oracle Procedural Gateway for APPC, be aware of these differences. Refer to "Parameter Changes for Version 4 to Release 9i Migration of Gateway" on page 7-3 for information about these parameters.
Changes and Enhancements in Previous Releases

**PG4APPC80 and PGAU80**
In this release of Oracle Procedural Gateway for APPC for Windows the following names have changed:

- PG4APPC.EXE (known as PG4APPC) has been changed to PG4APPC80.EXE (known as PG4APPC80).
- PGAU.EXE (known as PGAU) has been changed to PGAU80.EXE (known as PGAU80).

**SNA Server Version 2 Not Supported**
Microsoft SNA Server Version 2 is no longer supported with this release of Oracle Procedural Gateway for APPC for Windows NT.

**TNSNAMES.ORA**
The service name definition (from the Oracle Integrating Server to the gateway) must contain an extra parameter, \((\text{HS}=(\text{DRIVER}))\). Refer to “Configuring Your Network” on page 4-17 for additional information.

**Enhancements**
The following sections provide information on enhancements in release 8.0.6.0.0.

**Gateway Runs as a Process-Based Gateway**
With this release of the Oracle Procedural Gateway for APPC for Windows NT, 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 Net Administrator’s Guide* for more information about character limits for SID names.
GTWCONF.EXE is No Longer Included
The GTWCONF.EXE process is no longer included in the Oracle Procedural Gateway for APPC for Windows, beginning with this release.

Heterogeneous Services Architecture
This release of the 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
The 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 upon 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.

Refer to "Upgrade Considerations" on page 4-2 for more information about upgrading the gateway.

Corrected Problems in Previous Versions
The following tables list bug numbers and descriptions of the problems associated with them that have been corrected in previous releases of the gateway.

Release 9.0.1.1.0

<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1276298</td>
<td>When using an invalid value for receive parameter for the pgaxfer procedure, the user receives an ORA 28511 error message.</td>
</tr>
<tr>
<td>1302253</td>
<td>Oracle Procedural Gateway for APPC procedure statements executed on the Oracle Integrating Servers would hang in SQL*Plus, without giving any messages.</td>
</tr>
</tbody>
</table>
Corrected Problems in Previous Versions

<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1336805</td>
<td>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.</td>
</tr>
<tr>
<td>1404454</td>
<td>The pg4appc log file should be improved and have the received buffer in the log file.</td>
</tr>
<tr>
<td>1411694</td>
<td>The user receives message ORA-28527 when the PGA_CAPABILITY is set to READ_ONLY.</td>
</tr>
<tr>
<td>1472800</td>
<td>Multi-row queries failed on the following error messages: ORA-01401 and ORA-06512.</td>
</tr>
<tr>
<td>1519088</td>
<td>User received sporadic abends when inserting CICS records to VSAM file.</td>
</tr>
<tr>
<td>1724988</td>
<td>When the programmer used RPC PGAINIT_SEC, no matter what synclevel was being used, the following message was received: &quot;invalid SYNCHLEVEL, 152, specified; valid range is 0:1.&quot;</td>
</tr>
<tr>
<td>1677939</td>
<td>Oracle Procedural Gateway for APPC would partially transfer low values to VSAM files.</td>
</tr>
<tr>
<td>1722467</td>
<td>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.</td>
</tr>
</tbody>
</table>

Release 8.0.6.0.0

<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>561128</td>
<td>The PLSTYPE attribute of binary integers (COBOL COMP data items) had the wrong precision when the data was defined without COMPOPTS('TRUNC(BIN)') specified.</td>
</tr>
<tr>
<td>599696</td>
<td>PGAU COBOL parser did not accept OCCURS clause appearing before datatype as valid syntax.</td>
</tr>
<tr>
<td>603934</td>
<td>When COBOL data definitions contained OCCURS and REDEFINES, the PGAU-generated .pkb file was invalid.</td>
</tr>
</tbody>
</table>
Corrected Problems in Previous Versions

<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>689304</td>
<td>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 committed successfully. When this occurred, the Oracle recovery process (RECO) called 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.</td>
</tr>
<tr>
<td>883761</td>
<td>System Process - Out of Virtual Memory. After hours of service, pg4appc.exe would crash with an access violation. Using Windows Task Manager, customer would see pg4appc growing in memory continuously, until reaching the maximum amount of virtual memory. Then pg4appc.exe crashed with an access violation.</td>
</tr>
</tbody>
</table>

Release 4.0.1.1.0

<table>
<thead>
<tr>
<th>Bug Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>420391</td>
<td>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.</td>
</tr>
<tr>
<td>460960</td>
<td>ORA-9199 errors were generated by the gateway after some gateway exceptions due to a memory overlay.</td>
</tr>
<tr>
<td>473360</td>
<td>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.</td>
</tr>
<tr>
<td>506777</td>
<td>An ORA-1017 error was generated by the gateway when RECO attempted to log onto the gateway during recovery of a distributed transaction, even though the gateway was running in READ-ONLY mode.</td>
</tr>
<tr>
<td>521084</td>
<td>ORA-3106 errors were generated by the gateway on Windows under heavy transaction loads.</td>
</tr>
</tbody>
</table>
Known Problems in Previous Versions

The following problems were known to exist in past releases of the gateway. A current list of problems is available online. Contact your local Oracle Corporation office for information about accessing this online information. The following problems in the gateway or other products were known to affect the operation of products in their respective releases.

Release 4.0.1.1.0 and 8.0.6.0.0

**UTL_PG Does Not Handle Numeric Data Values Between 0 and +1 (Bug No. 360427)**
The UTL_PG.NUMBER_TO_RAW function incorrectly issues 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 to correct this bug.

**PGA Grows Excessively When Using Indexed PL/SQL Tables (Bug No. 373700)**
When TIPs are executed that use large PL/SQL tables, the memory usage grows excessively. Contact Oracle Support Services to order the patch to correct 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 to correct this bug.
Symbols

(\texttt{HS=(DRIVER)}) \textit{(TNSNAMES parameter for Oracle Net)}

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- with TCP/IP protocol, 4-18

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