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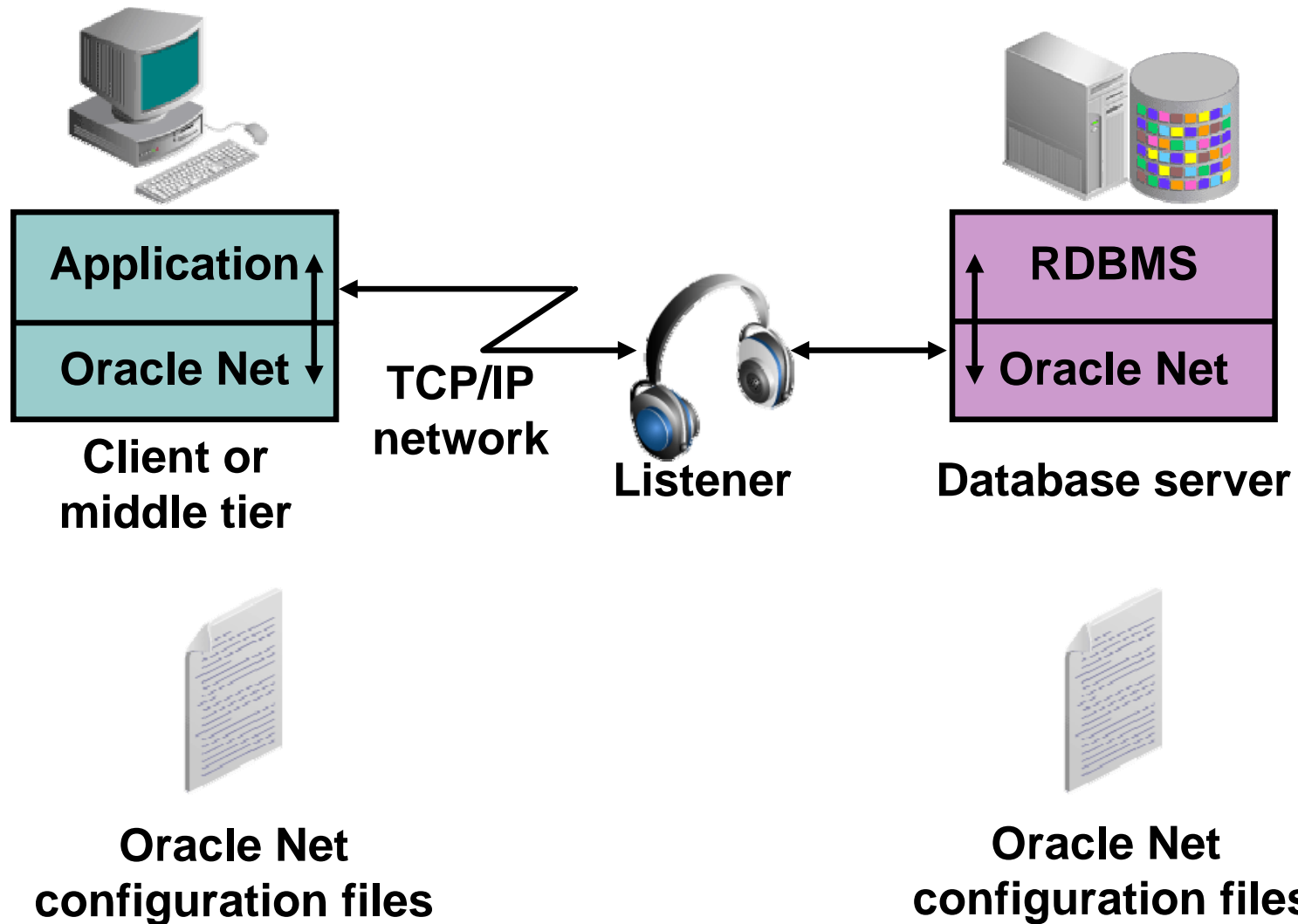
Configuring the Oracle Network Environment

Objectives

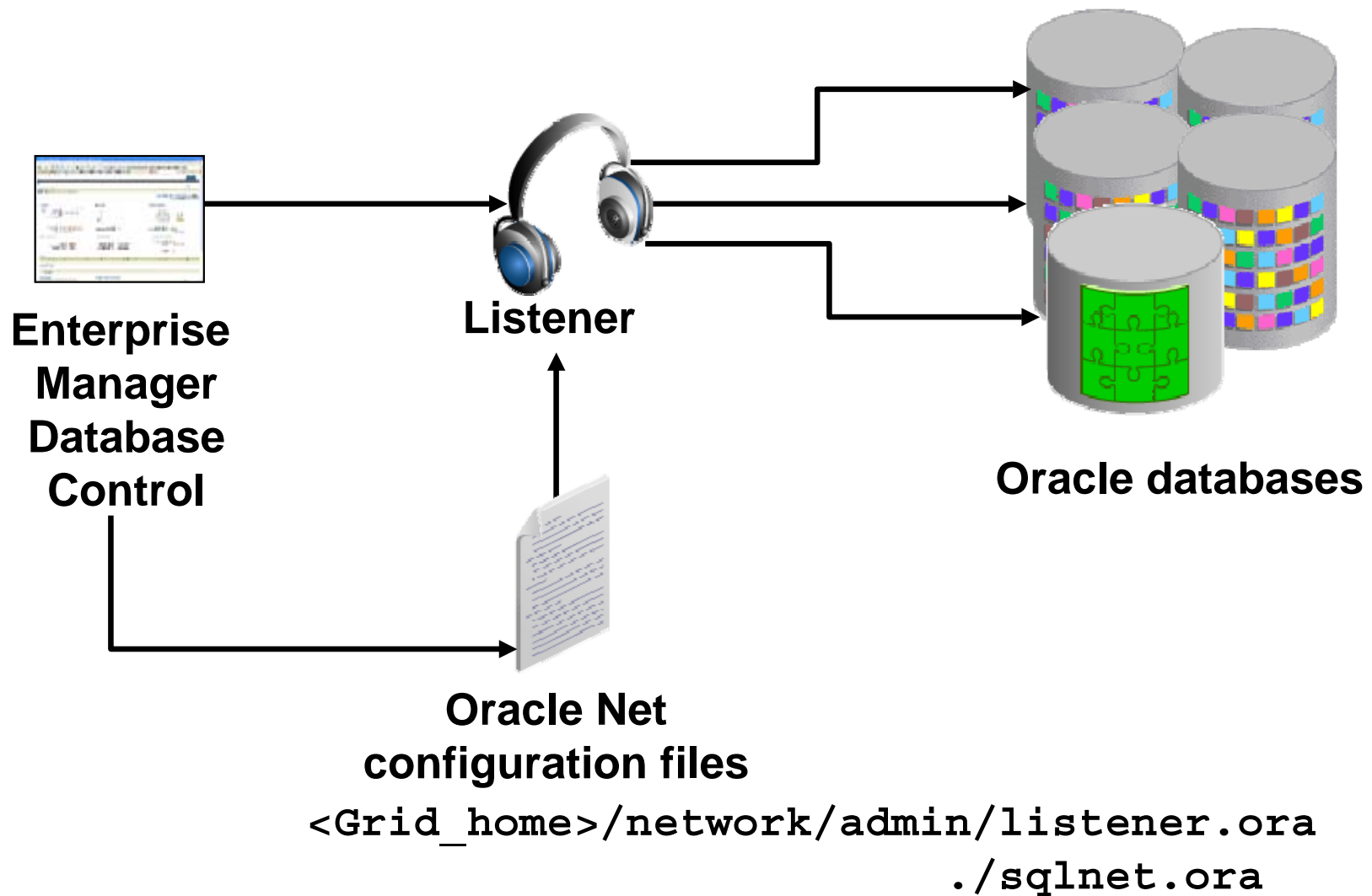
After completing this lesson, you should be able to:

- Use Enterprise Manager to:
 - Create additional listeners
 - Create Oracle Net Service aliases
 - Configure connect-time failover
 - Control the Oracle Net Listener
- Use `tnsping` to test Oracle Net connectivity
- Identify when to use shared servers and when to use dedicated servers

Oracle Net Services



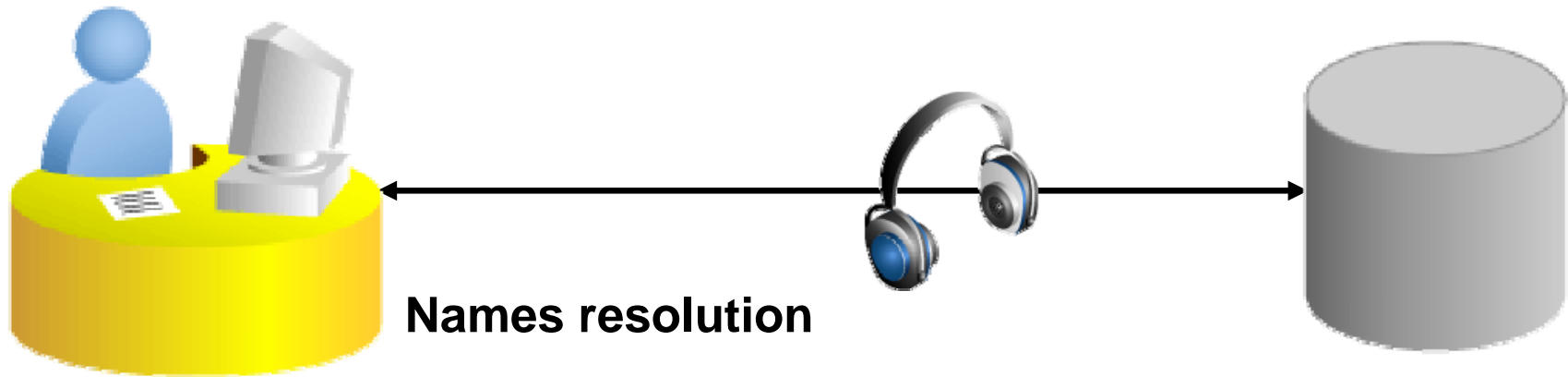
Oracle Net Listener



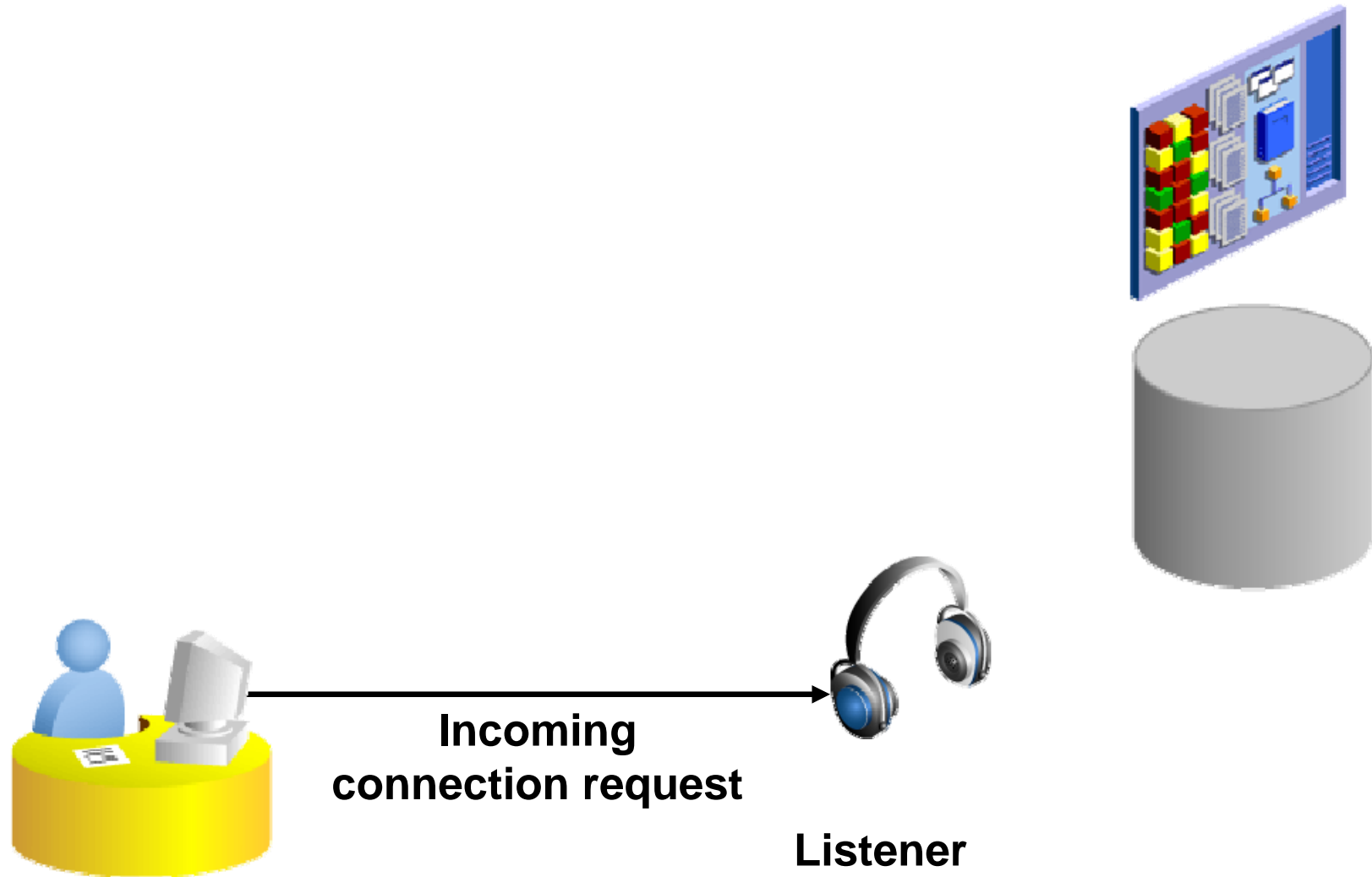
Establishing Net Connections

To make a client or middle-tier connection, Oracle Net requires the client to know the:

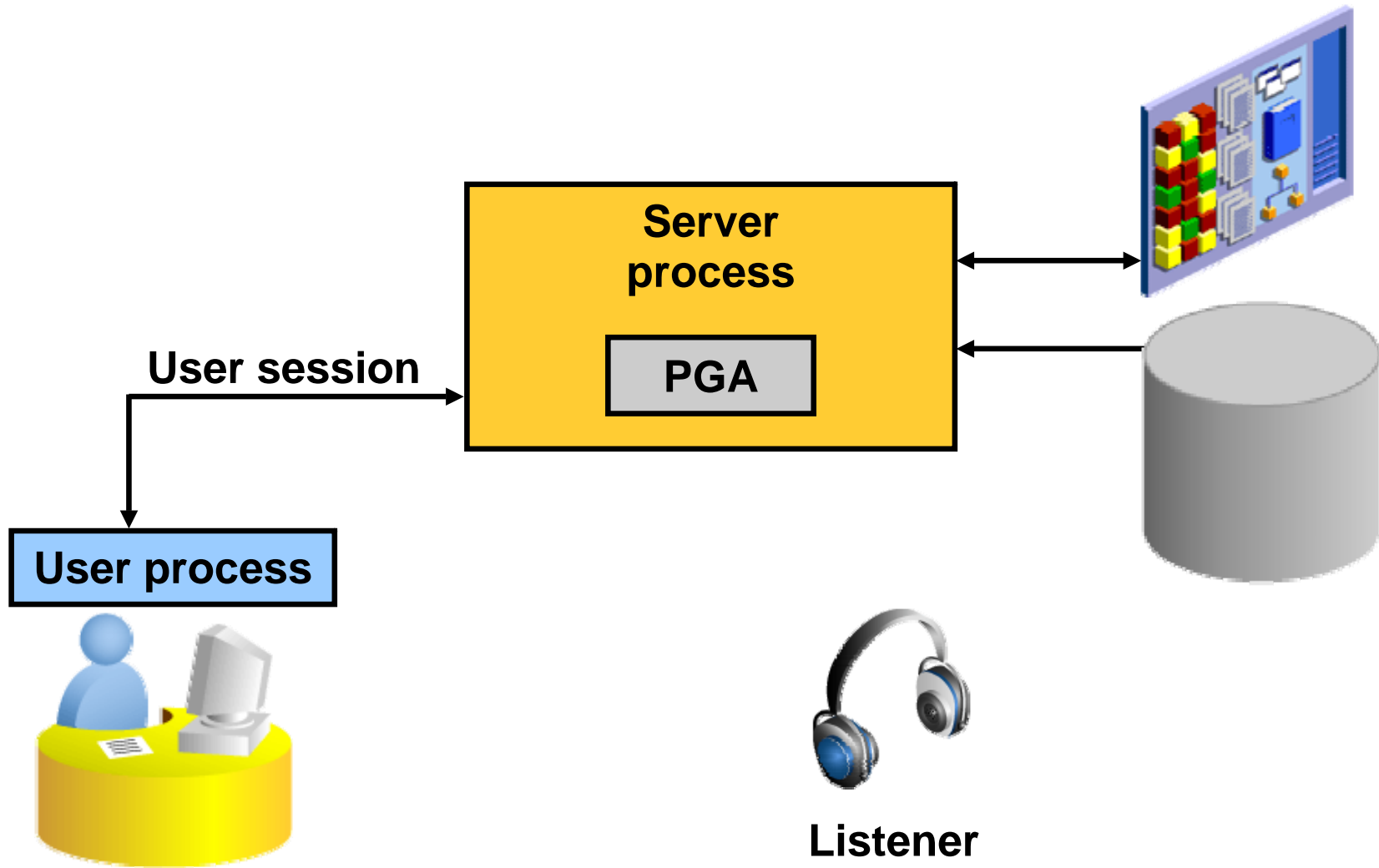
- Host where the listener is running
- Port that the listener is monitoring
- Protocol that the listener is using
- Name of the service that the listener is handling



Establishing a Connection



User Sessions



Tools for Configuring and Managing the Oracle Network

- Enterprise Manager Net Services Administration page
- Oracle Net Manager
- Oracle Net Configuration Assistant
- Command line



Listener Control Utility

Oracle Net listeners can be controlled with the `lsnrctl` command-line utility (or from EM).

```
$ . oraenv
ORACLE_SID = [orcl] ? +ASM
$ lsnrctl
LSNRCTL for Linux: Version 11.2.0.1.0 - Production on 30-JUN-2009 00:47:01
Copyright (c) 1991, 2009, Oracle. All rights reserved.
Welcome to LSNRCTL, type "help" for information.

LSNRCTL> help
The following operations are available
An asterisk (*) denotes a modifier or extended command:
start                stop                status
services             version             reload
save_config          trace              spawn
change_password      quit               exit
set*                 show*
```

Listener Control Utility Syntax

Commands from the listener control utility can be issued from the command line or from the LSNRCTL prompt.

- Command-line syntax:

```
$ lsnrctl <command name>  
$ lsnrctl start  
$ lsnrctl status
```

- Prompt syntax:

```
LSNRCTL> <command name>  
LSNRCTL> start  
LSNRCTL> status
```

Using SRVCTL to Start and Stop the Listener


If Oracle Restart is configured to monitor your listener, you should use SRVCTL to manage that listener.

- Example syntax:

```
$ srvctl -h
$ srvctl start listener
$ srvctl stop listener
$ srvctl start listener -l mylistener
$ srvctl status listener
```

Listener Home Page


General

 [Shutdown](#) [Black Out](#)

Status **Up**
Up Since **Jun 19, 2009 2:02:00 AM GMT+07:00**
Instance Name **orcl**
Version **11.2.0.1.0**
Host **edrsr25p1.us.oracle.com**
Listene **LISTENER_edrsr25p1.us.orac...**
ASM **+ASM_edrsr25p1.us.oracle.com**

[View All Properties](#)

General

 [Edit](#) [Stop](#) [Black Out](#)

Status **Up**
Availability (%) **100**
(Last 24 Hours)
Alias **LISTENER**
Version **11.2.0.1.0**
Oracle Home **/u01/app/oracle/product/11.2.0/grid**
Net Address **(ADDRESS=(PROTOCOL=TCP)
(HOST=edrsr25p1.us.oracle.com)(PORT=1521))**
LISTENER.ORA Location **/u01/app/oracle/product/11.2.0/grid/network
/admin**
Start Time **Jun 18, 2009 3:20:31 AM**
Host **edrsr25p1.us.oracle.com**
Oracle Restart **Enabled**

State

TNS Ping (ms) **✓ 10**
Established Connections per minute **2.2**
Refused Connections per minute **0**

Net Services Administration Page

ORACLE® Enterprise Manager 11g Database Control [Setup](#) [Preferences](#) [Help](#) [Logout](#)

Host: [edrsr25p1.us.oracle.com](#) >

Net Services Administration

Net Services Administration allows you to configure or administer the following network components:

- Listener: Allows configuration and administration functions on listeners.
- Directory Naming: Allows configuration and administration of Net service names on a Directory server.
- Local Naming: Allows configuration and administration of Net service names on a client's tnsnames.ora file.
- Network Profile: Allows configuration of preferences for Oracle Net Services features on the client or server.
- File Location: Allows specification of the configuration file location for the Oracle Home.

Choose a configuration file location, then select the feature that you want to administer and click 'Go'.

Administer	Select Configuration	Oracle Home
Listeners	/u01/app/oracle/product/11.2.0/db_home1/network/admin	/u01/app/oracle/product/11.2.0/db_home1
Directory Naming		
Local Naming		
Network Profile		
File Location		

[Database](#) | [Setup](#) | [Preferences](#) | [Help](#) | [Logout](#)

Creating a Listener

Net Services Administration

Net Services Administration allows you to:

- Listener: Allows configuration and administration of the listener.
- Directory Naming: Allows configuration of the directory naming service.
- Local Naming: Allows configuration of the local naming service.
- Network Profile: Allows configuration of the network profile.
- File Location: Allows specification of the file location.

Choose a configuration file location, then select the configuration file to administer.

Administer **Listeners**

Select Configuration File Location	Oracle Home
<input checked="" type="radio"/> /u01/app/oracle/product/11.2.0/db_home1/network/admin	/u01/app/oracle/product/11.2.0/db_home1

Net Services Administration: Host Login

Host **edrsr25p1.us.oracle.com**

Oracle Home **/u01/app/oracle/product/11.2.0/db_home1**

* Username **oracle**

* Password **.....**

☐ Save as Preferred Credential

Listeners: /u01/app/oracle/product/11.2.0/db_home1/network/admin

A listener process is identified by the listening end-points ('Host' and 'Port'), along with the other parameters like, logging and tracing levels, log/trace directories etc. All these parameters are defined in the "Listener Parameter File" (listener.ora). This page shows the status of a listener as "Started" only when the listener is running, and has been started using the "Listener Parameter File" at the same location as shown above.

Create Listener

General **Authentication** **Logging & Tracing** **Static Database Registration** **Other Services**

* Listener Name **LISTENER0**

Addresses

Listener must have at least one address. If address is changed, listener will be stopped before applying changes.

Select Protocol	Protocol Details
(No items found.)	

Adding Listener Addresses

Add Address

Protocol: TCP/IP

* Port: 1522

* Host: edrsr25p1.us.oracle.com

Advanced Parameters

The following parameters are introduced in

Total Send:

Buffer Size: (Bytes) Cumulative size for all send

Total Receive:

Creation Message

Listener "LISTENER0" created successfully

Listeners: /u01/app/oracle/product

A listener process is identified by the listener name, log/trace directories etc. All these parameters are defined in the "Listener Parameter File" (listener.ora). This page shows the status of a listener as "Started" only when the listener is running, and has been started using the "Listener Parameter File" at the same location as shown above.

Listener Name: Go

Create Listener

Listener Name: LISTENER0

Addresses

Listener must have at least one address. If address is changed, listener will be stopped before applying changes.

Select	Protocol	Protocol Details
<input checked="" type="radio"/>	TCP/IP	Host: edrsr25p1.us.oracle.com Port: 1522

Listeners

Listener Name: Go

Select	Name	Protocol Details	Status	Enterprise Manager Target
<input checked="" type="radio"/>	LISTENER0	Protocol: TCP/IP Host: edrsr25p1.us.oracle.com Port: 1522	Stopped	Not a target

Database Service Registration

Edit Listener: LISTENER0

Cancel OK

General Authentication Logging & Tracing **Static Database Registration** Other Services

* Listener Name LISTENER0

Edit Listener: LISTENER0

Cancel OK

General Authentication Logging & Tracing **Static Database Registration** Other Services

Configure the static registration of databases for the listener. Database information for Oracle8i or later releases is dynamically registered with the listener during instance startup. Therefore, static registration is not required for these releases, unless you require remote database startup from other than Oracle Enterprise Manager. Click Help for more details.

Add

Select	Service Name	Oracle Home Directory	Oracle System Identifier (SID)
	(No items found.)		

Add Database Service

Cancel OK

* Service Name orcl.example.com

* Oracle Home Directory /p/oracle/product/11.2.0/db_home1

* Oracle System Identifier (SID) orcl

Naming Methods

Oracle Net supports several methods of resolving connection information:

- Easy connect naming: Uses a TCP/IP connect string
- Local naming: Uses a local configuration file
- Directory naming: Uses a centralized LDAP-compliant directory server
- External naming: Uses a supported non-Oracle naming service

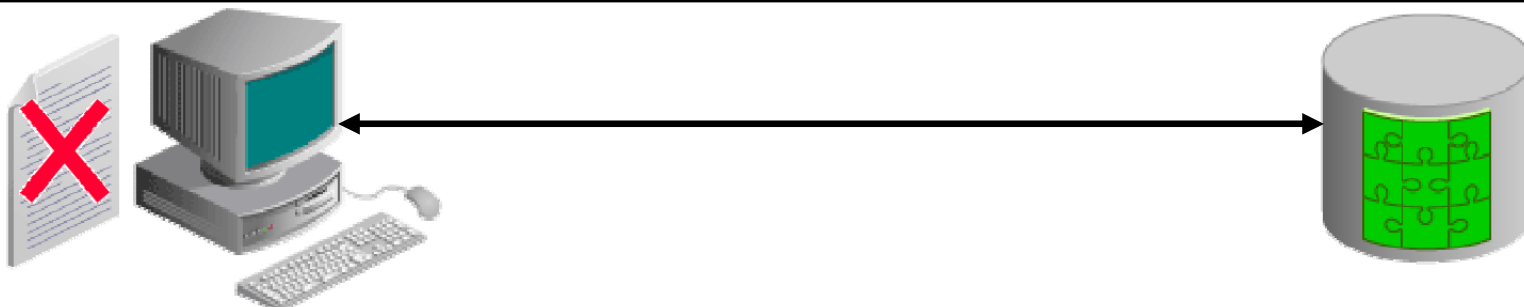


Oracle Net configuration files

Easy Connect

- Is enabled by default
- Requires no client-side configuration
- Supports only TCP/IP (no SSL)
- Offers no support for advanced connection options such as:
 - Connect-time failover
 - Source routing
 - Load balancing

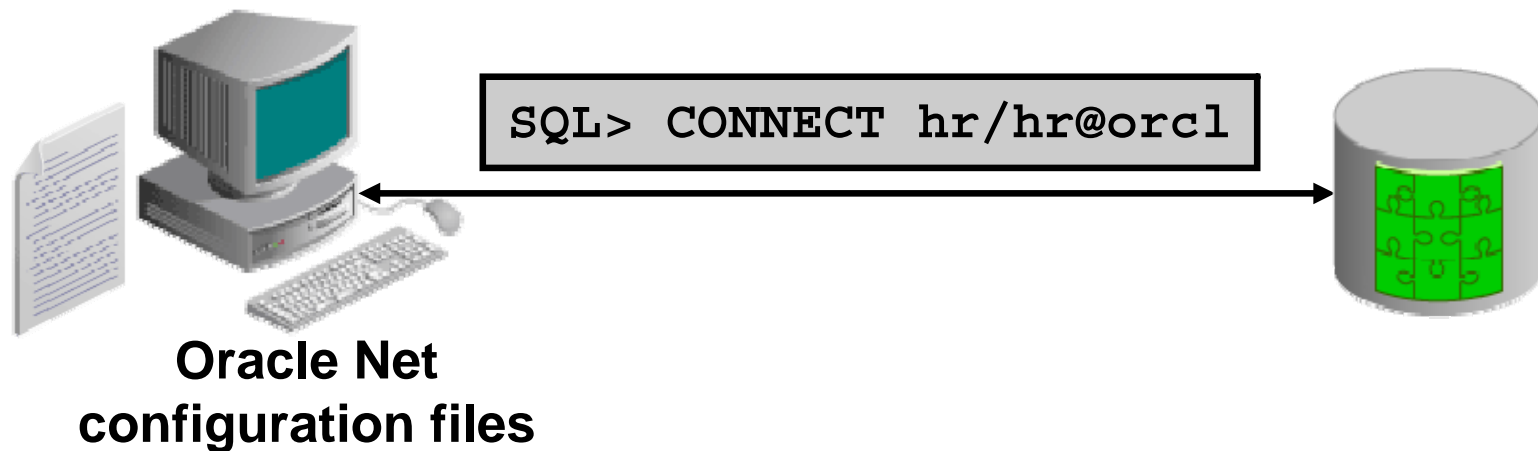
```
SQL> CONNECT hr/hr@db.us.oracle.com:1521/dba11g
```



No Oracle Net configuration files

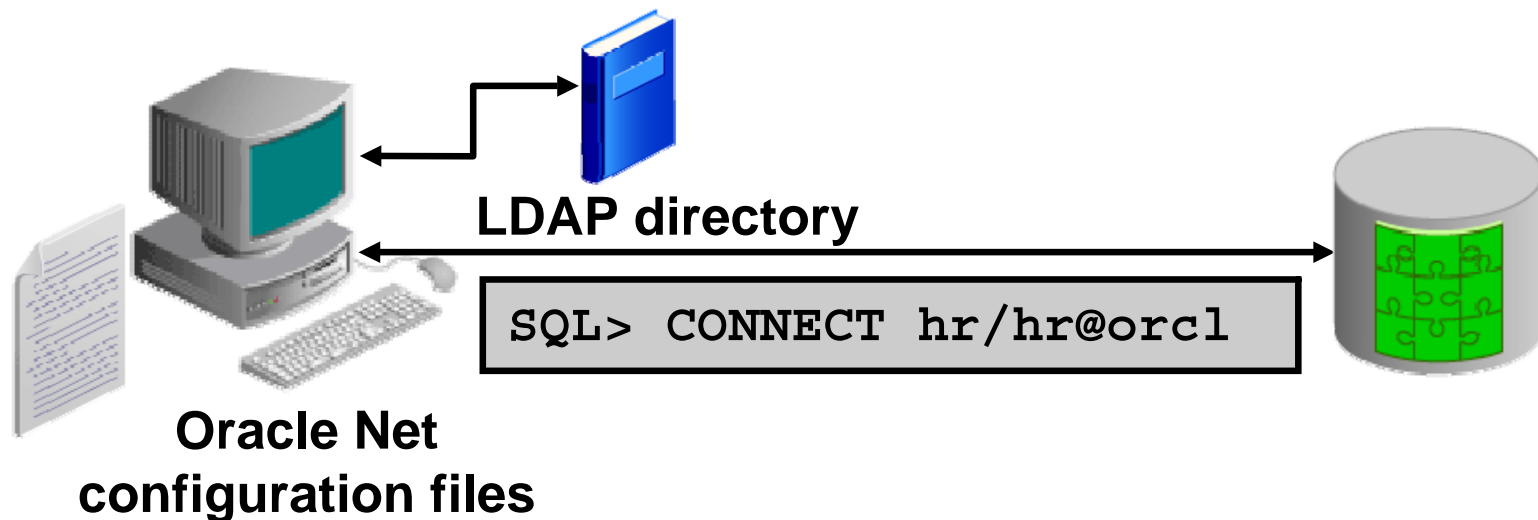
Local Naming

- Requires a client-side Names Resolution file
- Supports all Oracle Net protocols
- Supports advanced connection options such as:
 - Connect-time failover
 - Source routing
 - Load balancing



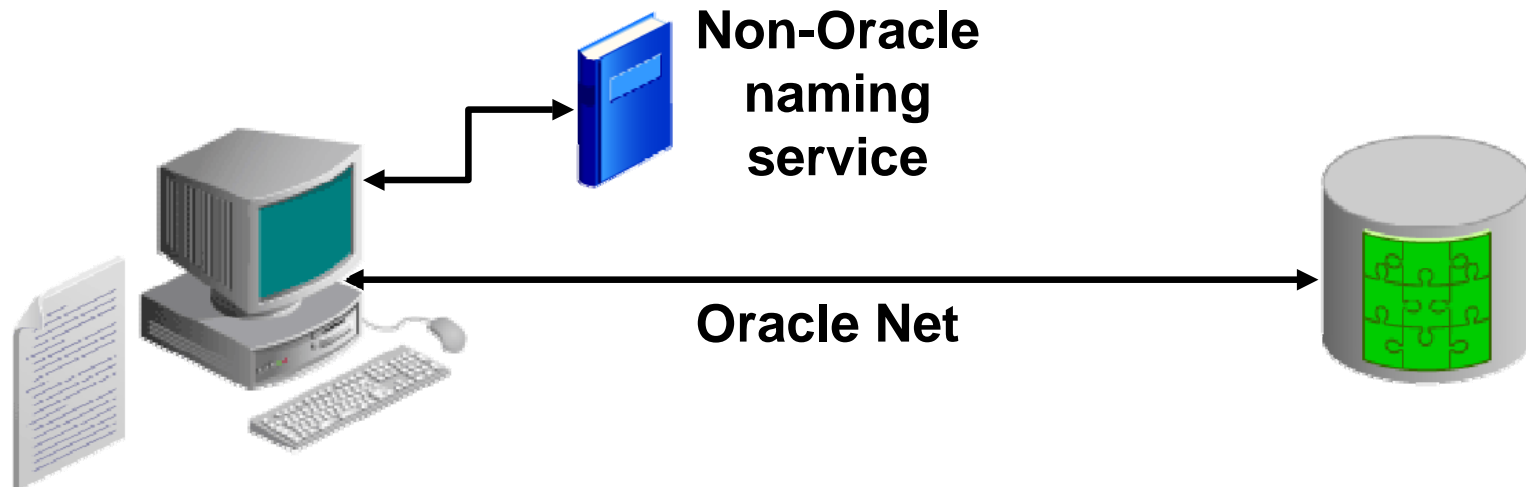
Directory Naming

- Requires LDAP with Oracle Net Names Resolution information loaded:
 - Oracle Internet Directory
 - Microsoft Active Directory Services
- Supports all Oracle Net protocols
- Supports advanced connection options



External Naming Method

- Uses a supported non-Oracle naming service
- Includes:
 - Network Information Service (NIS) External Naming
 - Distributed Computing Environment (DCE) Cell Directory Services (CDS)



Configuring Service Aliases

Local Naming: /u01/app/oracle/product/11.2.0/db_home1/network/admin

These are the local Net Service Names in tnsnames.ora file at /u01/app/oracle/product/11.2.0/db_home1/network/admin. You can test, edit, create and delete a Net Service Name.

Search

Net Service Name

Create Net Service Name

General **Advanced**

* Net Service Name

Database Information

To identify the database or service, you must provide either its service name (recommended) or the Oracle System Identifier (SID). The service name is normally its global database name, a name comprising the database name and domain name.

☒ Use Service Name
Service Name

☐ Use SID
SID

Add Address

Protocol

* Port

* Host
The host name or IP address of the computer.

Addresses

Select	Protocol	Protocol Details
	(No items found.)	

```
graph TD
    Create[Create] --> Advanced[Advanced Tab]
    Advanced --> AddAddress[Add Address Dialog]
    AddAddress --> Add[Add Button]
```

Advanced Connection Options

Oracle Net supports the following advanced connection options with local and directory naming:

- Connect-time failover
- Source routing
- Load balancing

AddressesAdd

Edit Remove Reorder Move To Top Go

Select	Protocol	Protocol Details
<input checked="" type="radio"/>	TCP/IP	Host edrsr25p1.us.oracle.com Port 1522
<input type="radio"/>	TCP/IP	Host edrsr25p1.us.oracle.com Port 1521

Connect-time Failover and Client Load Balancing
Configure whether addresses are tried randomly or sequentially during connections to the service. This setting is applicable only if there are more than one addresses configured.

- ☐ Try each address, in order, until one succeeds
- ☒ Try each address randomly, until one succeeds
- ☐ Try one address, selected at random
- ☐ Use each address in order until destination is reached
- ☐ Use only the first address

Testing Oracle Net Connectivity

The `tnsping` utility that tests Oracle Net service aliases:

- Ensures connectivity between the client and the Oracle Net Listener
- Does not verify that the requested service is available
- Supports Easy Connect Names Resolution:

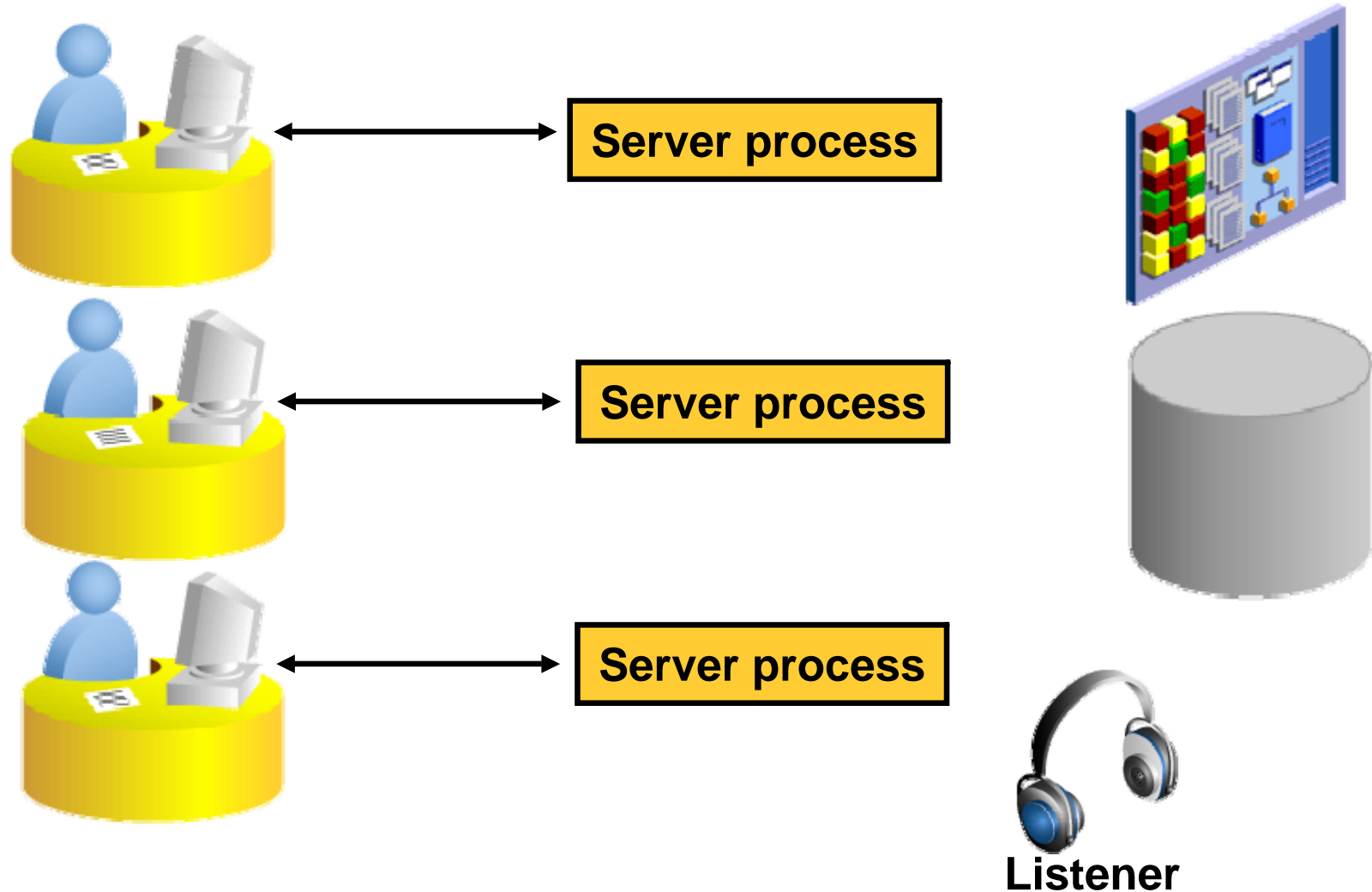
```
tnsping host01.example.com:1521/orcl
```

- Supports local and directory naming:

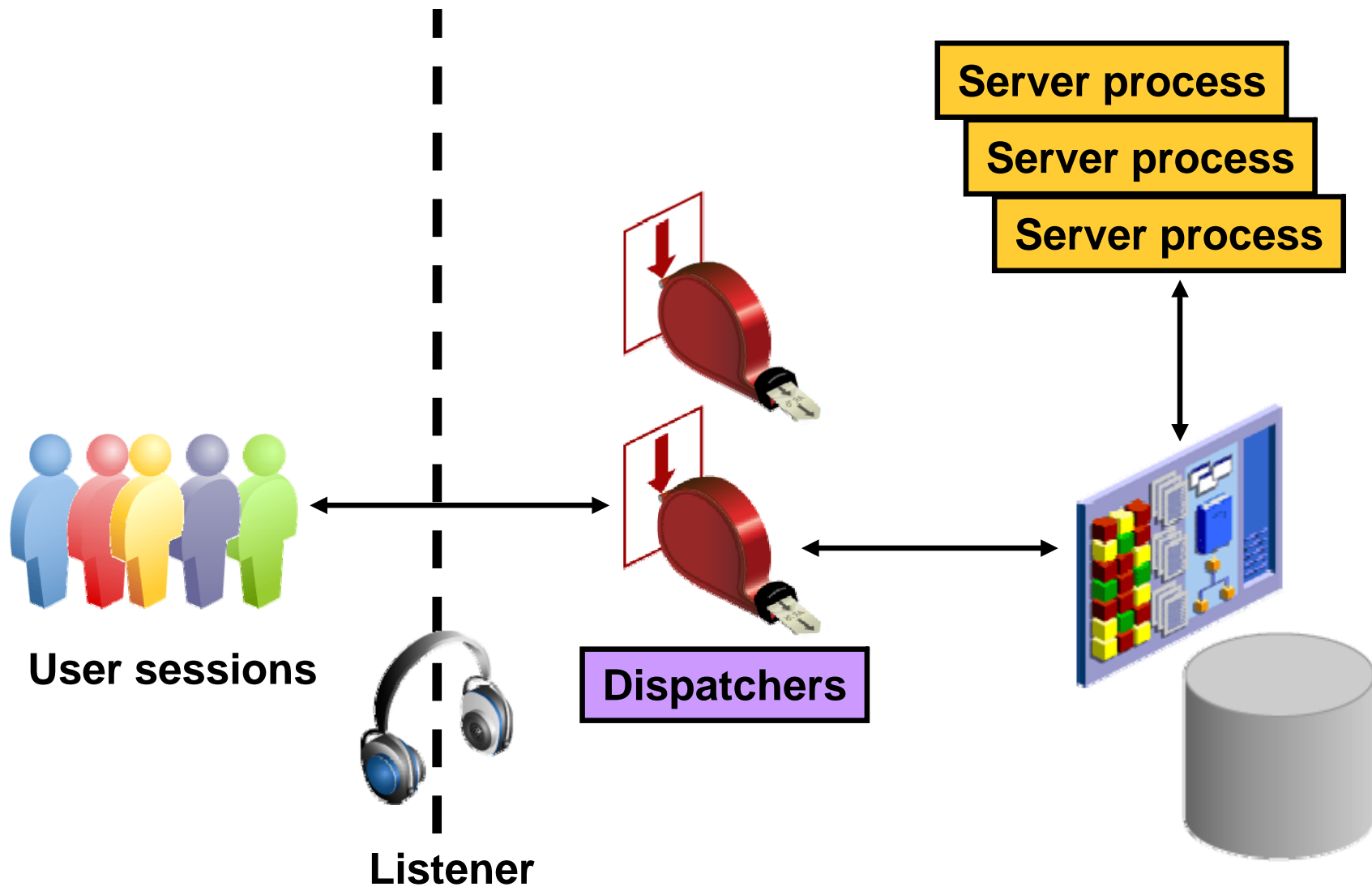
```
tnsping orcl
```


User Sessions: Dedicated Server Process

User sessions

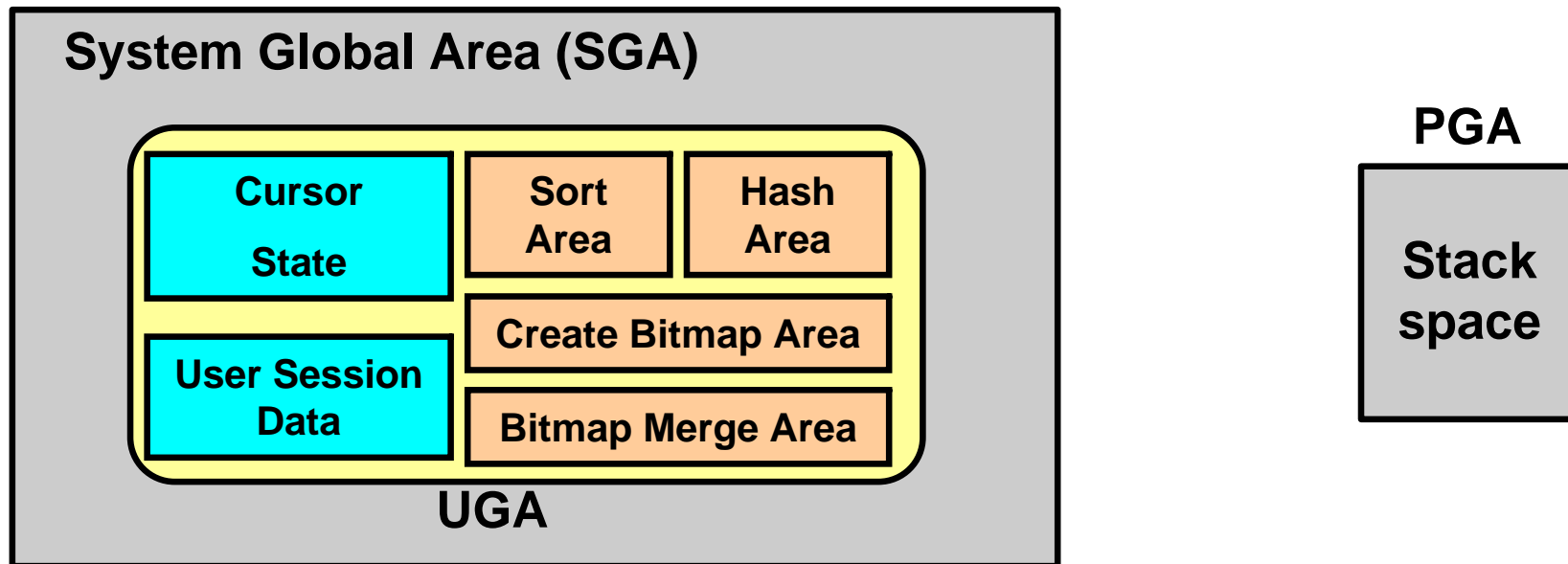


User Sessions: Shared Server Processes



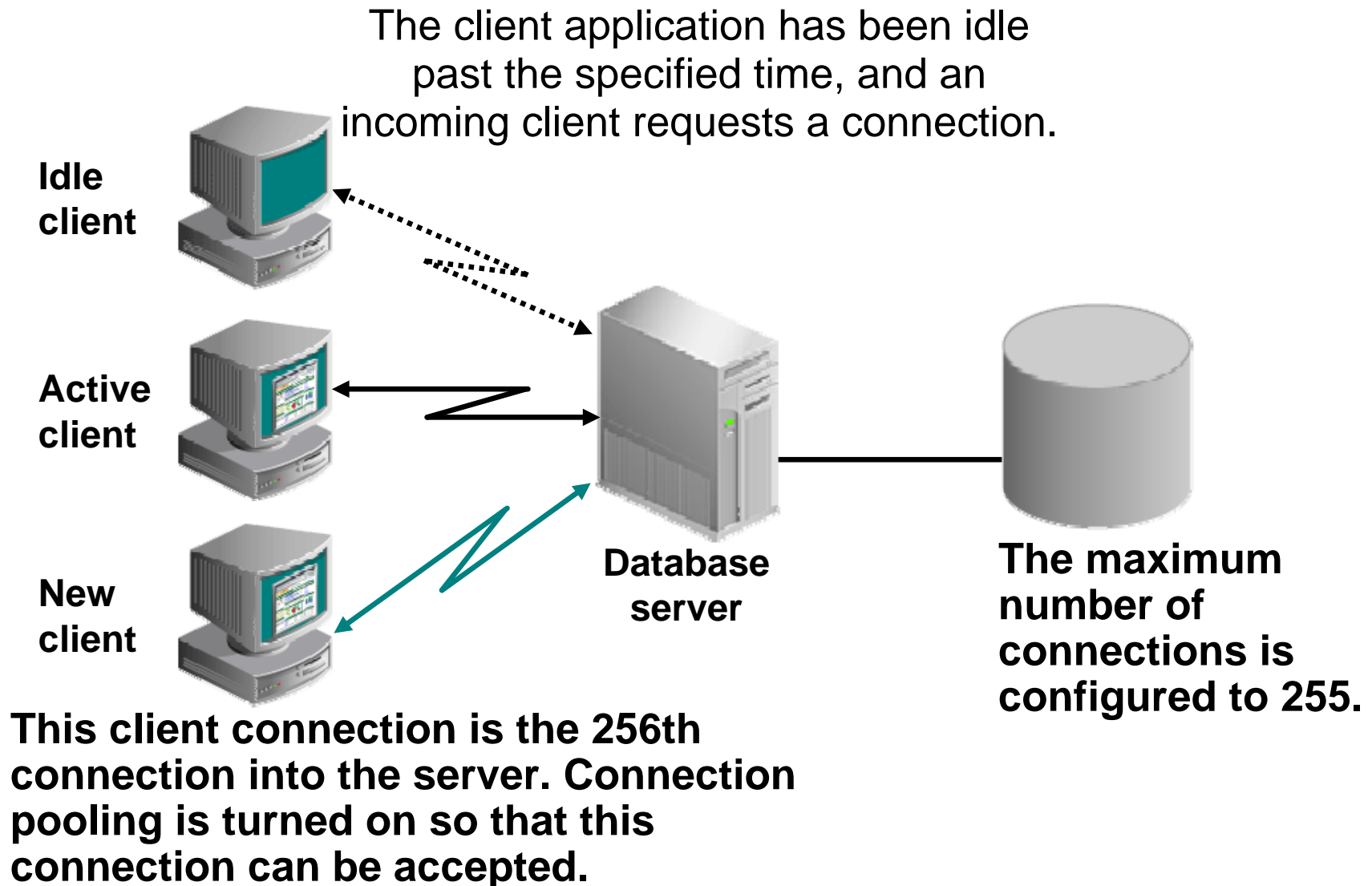
SGA and PGA

Oracle Shared Server: User session data is held in the SGA.



Remember to consider shared server memory requirements when sizing the SGA.

Shared Server: Connection Pooling



When Not to Use a Shared Server

Certain types of database work must not be performed using shared servers:

- Database administration
- Backup and recovery operations
- Batch processing and bulk load operations
- Data warehouse operations



Dispatcher



**Dedicated
server process**

Configuring Communication Between Databases

- Sending data or messages between sites requires network configuration on both sites.
- You must configure the following:
 - Network connectivity (for example, TNSNAMES.ora)
 - Database links

```
CREATE DATABASE LINK <remote_global_name>  
CONNECT TO <user> IDENTIFIED BY <pwd>  
USING '<connect_string_for_remote_db>';
```

Connecting to Another Database

```
REMOTE_ORCL =  
  (DESCRIPTION =  
    (ADDRESS = (PROTOCOL = TCP)  
      (HOST = host02.example.com)  
      (PORT = 1521))  
    (CONNECT_DATA =  
      (SERVER = DEDICATED)  
      (SERVICE_NAME = orcl.example.com)  
    )  
  )
```

tnsnames.ora

```
CONNECT hr/hr@orcl;  
  
CREATE DATABASE LINK remote  
CONNECT TO HR IDENTIFIED BY HR  
USING 'REMOTE_ORCL';  
  
SELECT * FROM employees@remote
```

SQL*Plus

Quiz

Which configuration files are used to configure the listener?

1. listener.ora
2. listener.conf
3. tnsnames.ora
4. tnsnames.conf
5. sqlnet.ora
6. sqlnet.conf

Quiz

When using the shared server process architecture, the PGA is relocated into the SGA.

1. True
2. False

Summary

In this lesson, you should have learned how to:

- Use Enterprise Manager to:
 - Create additional listeners
 - Create Oracle Net Service aliases
 - Configure connect-time failover
 - Control the Oracle Net Listener
- Use `tnsping` to test Oracle Net connectivity
- Identify when to use shared servers and when to use dedicated servers

Practice 6 Overview: Working with Oracle Network Components

This practice covers the following topics:

- Configuring local Names Resolution to connect to another database
- Creating a second listener for connect-time failover