

# Configuring the Oracle Network Environment

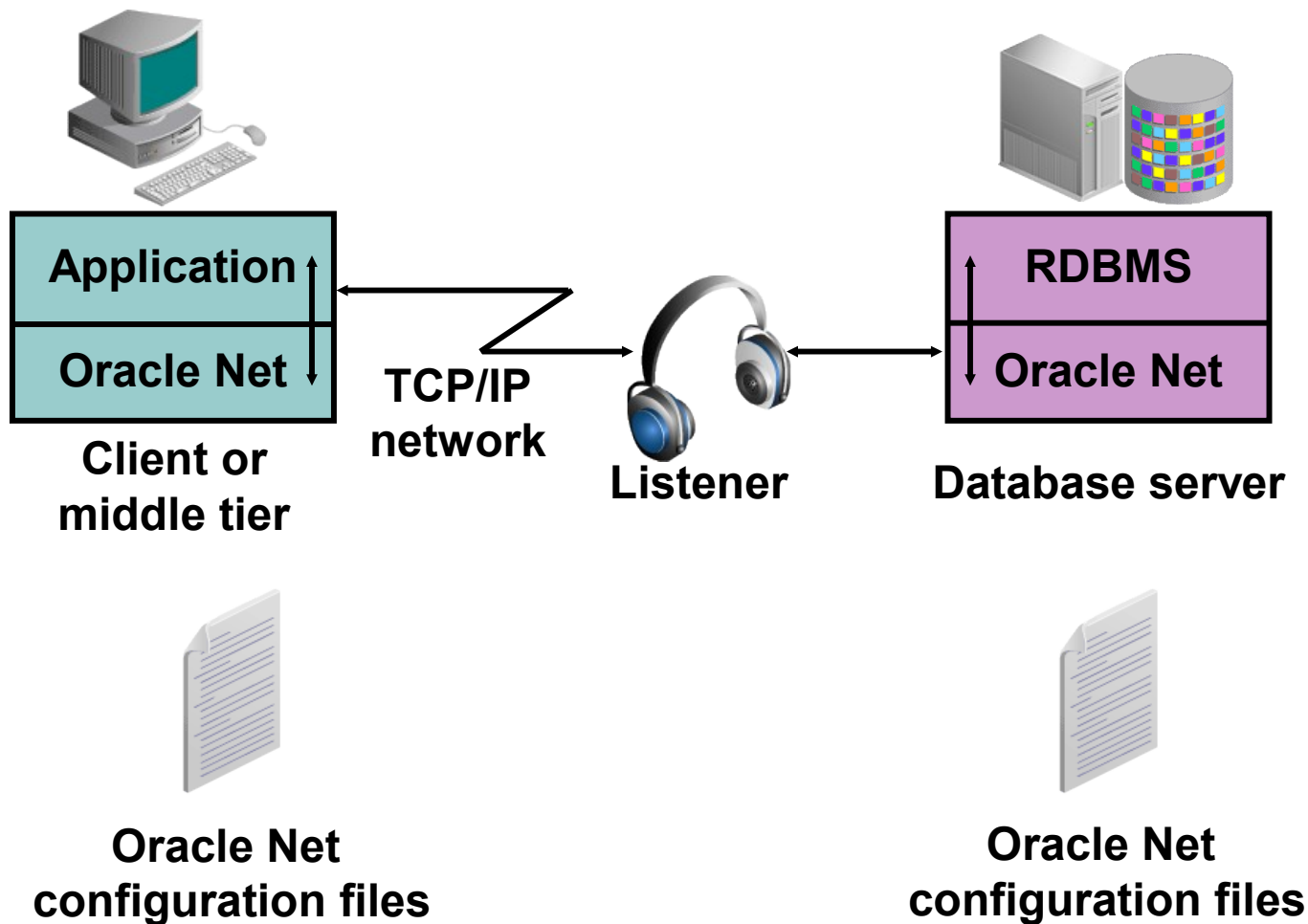


# Objectives

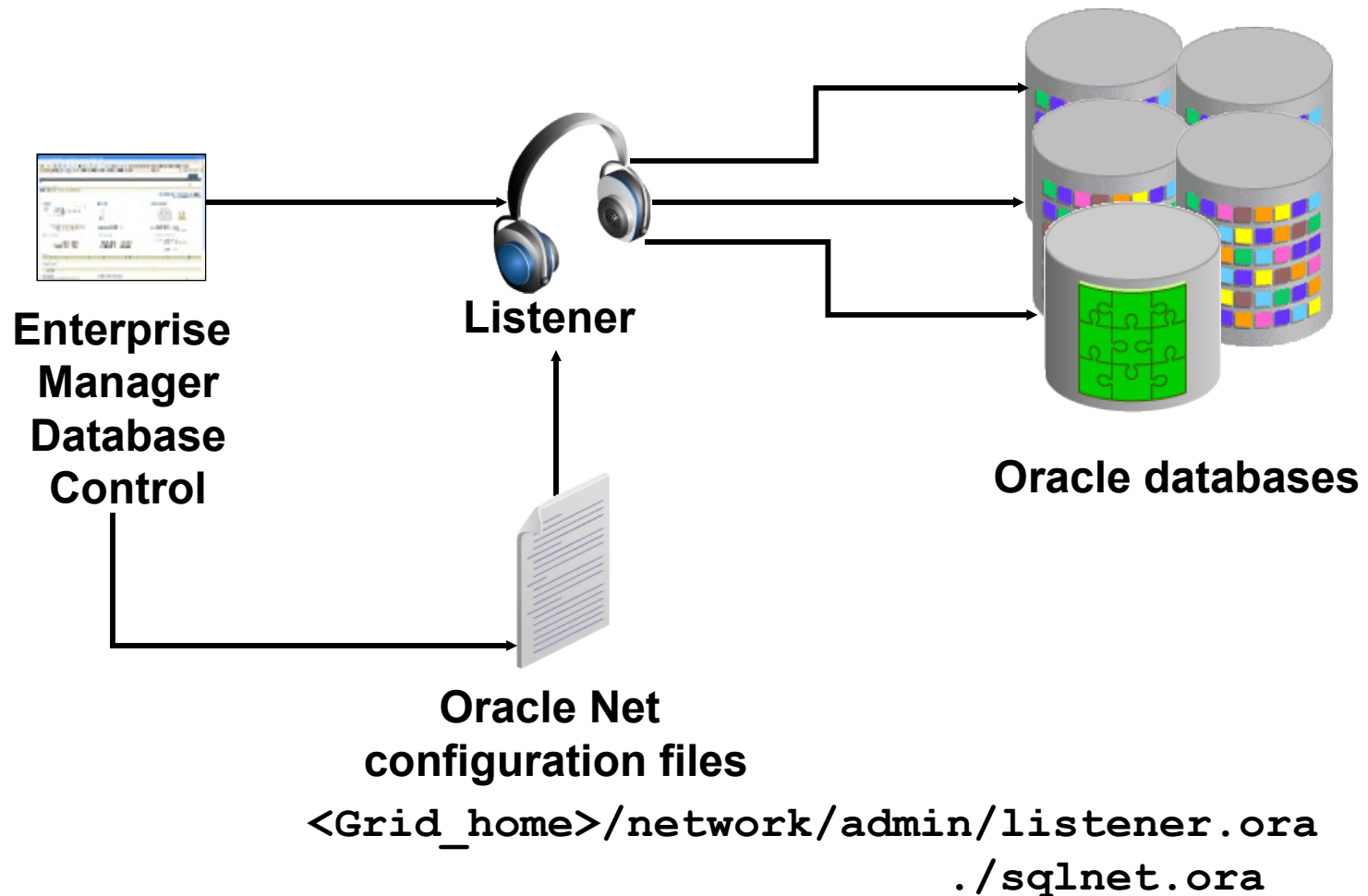
After completing this lesson, you should be able to:

- 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



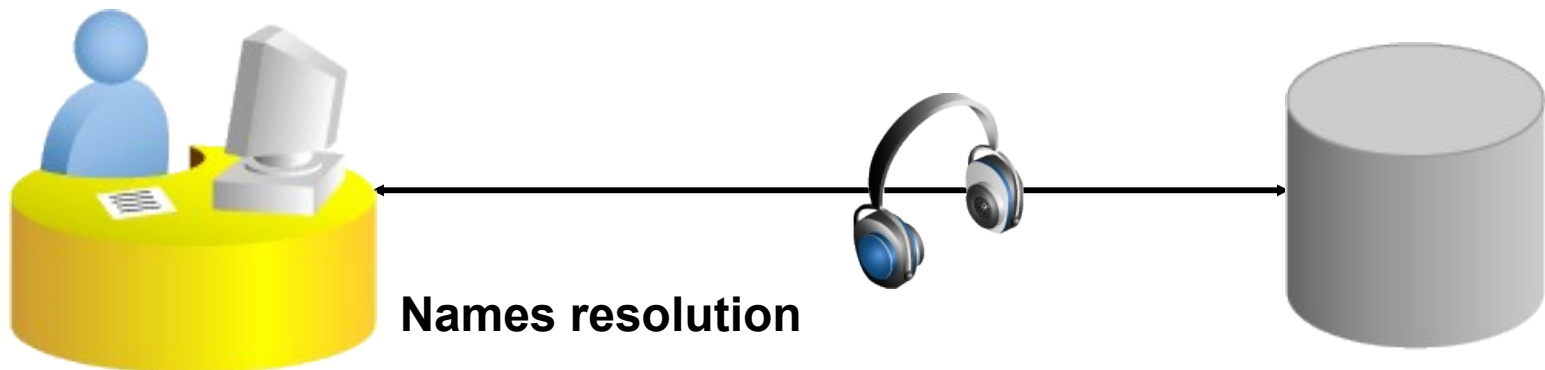
# Oracle Net Listener



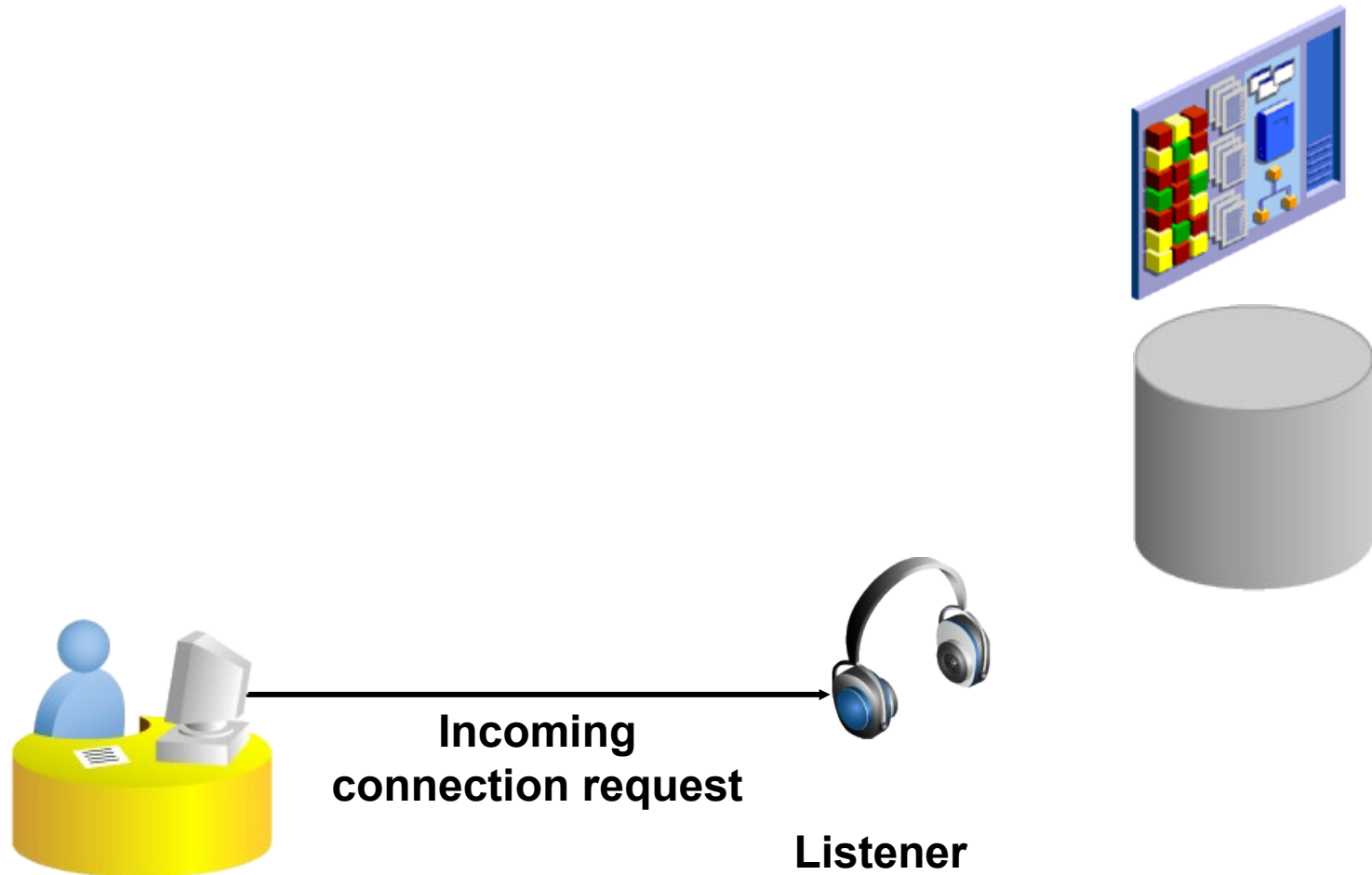
# Establishing Net Connections

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

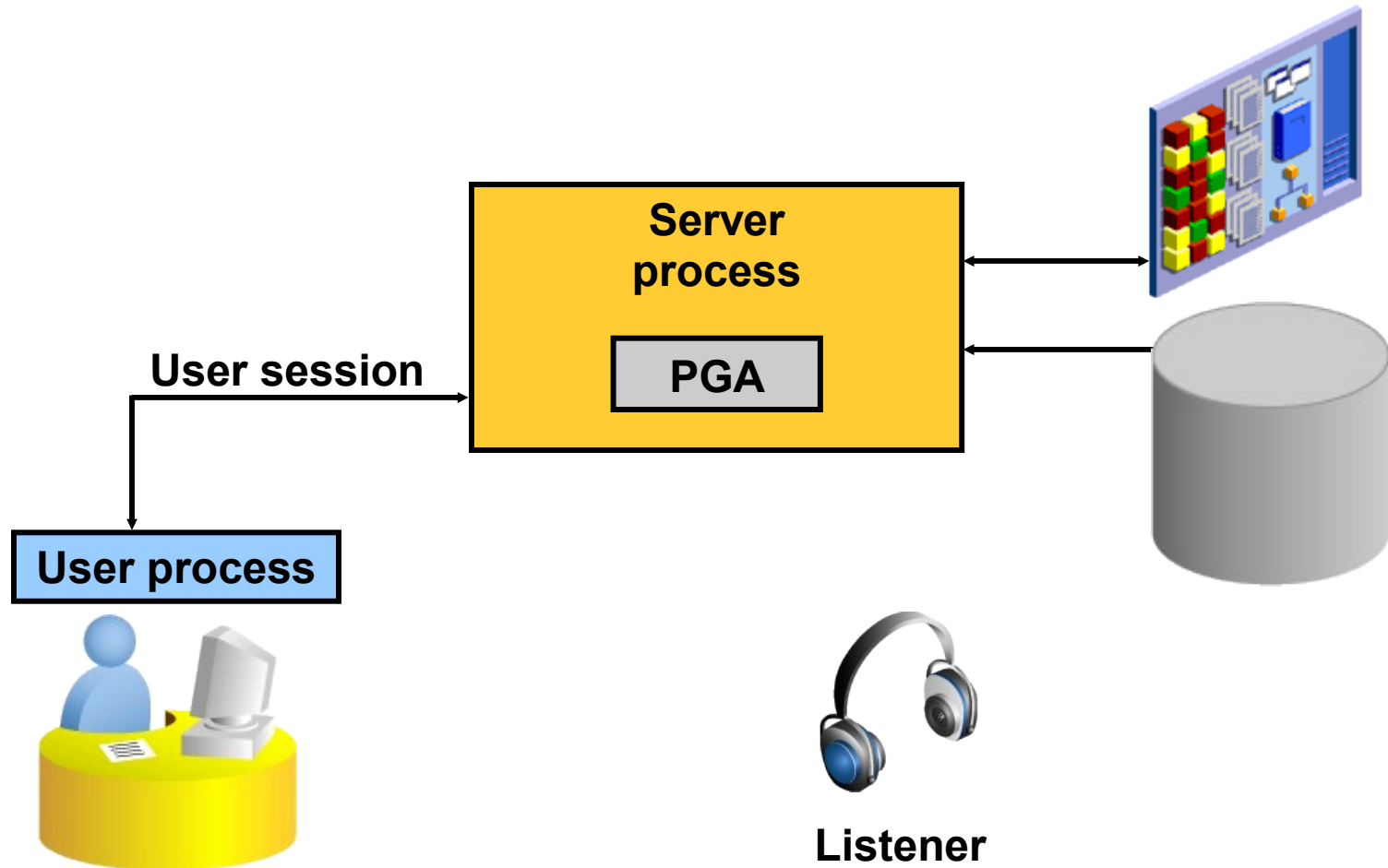
- Host where the listener is running
- Port that the listener is monitoring
- Protocol that the listener is using
- Name of the service that the listener is handling



# 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** [Setup](#) [Preferences](#) [Help](#) [Logout](#)  
Database Control [Database](#)

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
<div>Listeners</div>	Listeners	
<div>Directory Naming</div>	Directory Naming	
<div>Local Naming</div>	Local Naming	
<div>Network Profile</div>	Network Profile	
<div>File Location</div>	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:

Administer **Listeners** Go

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

Cancel Login

**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**

Cancel OK

**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.

Add

Select Protocol	Protocol Details
(No items found.)	



# Adding Listener Addresses

**Add Address**

Protocol: TCP/IP

Port: 1522

Host: edrsr25p1.us.oracle.com

**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: /u01/app/oracle/product**

A listener process is identified by the listener 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.

Listener Name:  Go

Actions: Start/Stop 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

**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)
<input type="checkbox"/>	(No items found.)		

**Add Database Service** Cancel OK

\* Service Name

\* Oracle Home Directory

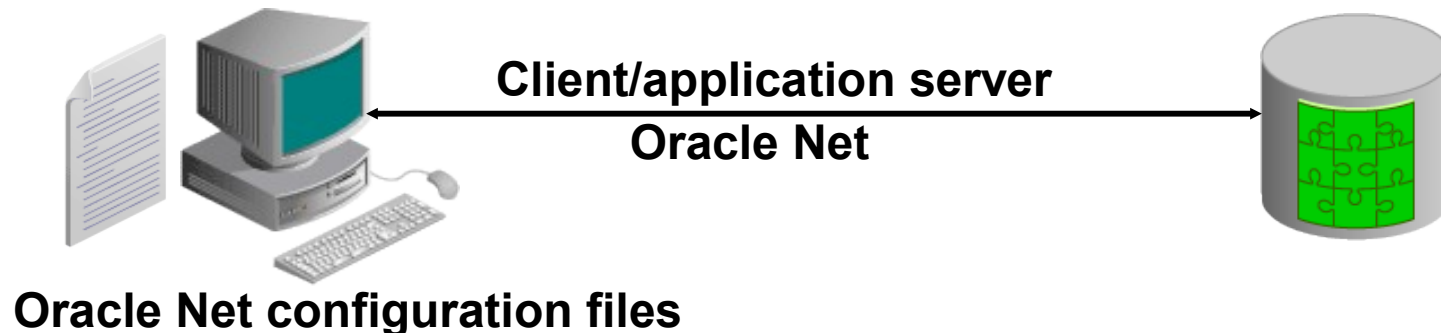
\* Oracle System Identifier (SID)



# Naming Methods

Oracle Net supports several methods of resolving connection information:

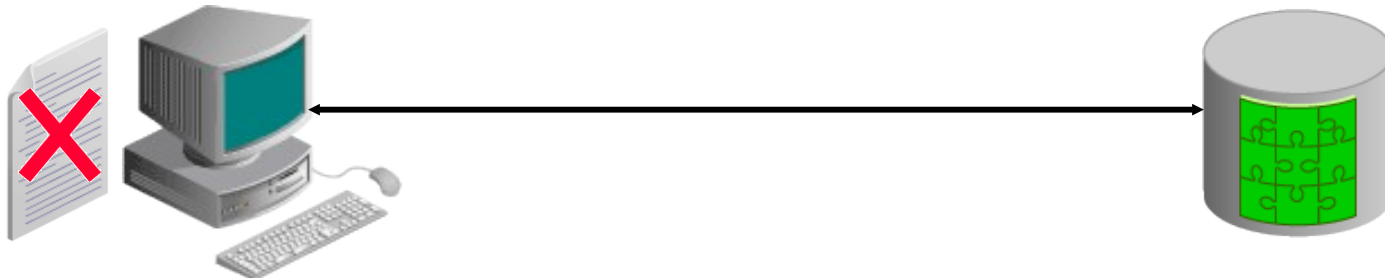
- Easy connect naming: Uses a TCP/IP connect string
- Local naming: Uses a local configuration file
- Directory naming: Uses a centralized LDAP-compliant directory server
- External naming: Uses a supported non-Oracle naming service



# 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

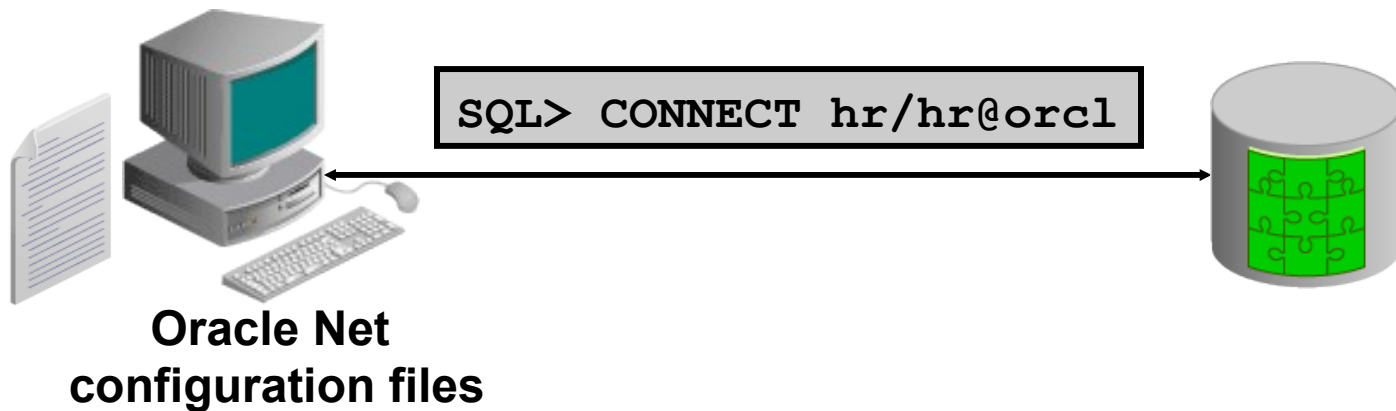
```
SQL> CONNECT hr/hr@db.us.oracle.com:1521/dba11g
```



**No Oracle Net configuration files**

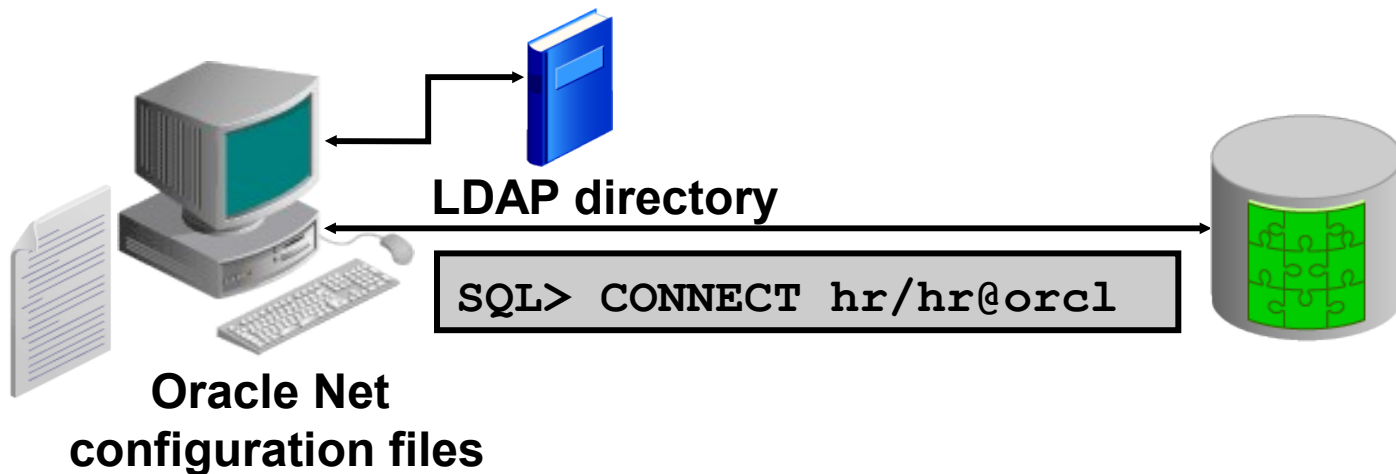
# Local Naming

- 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



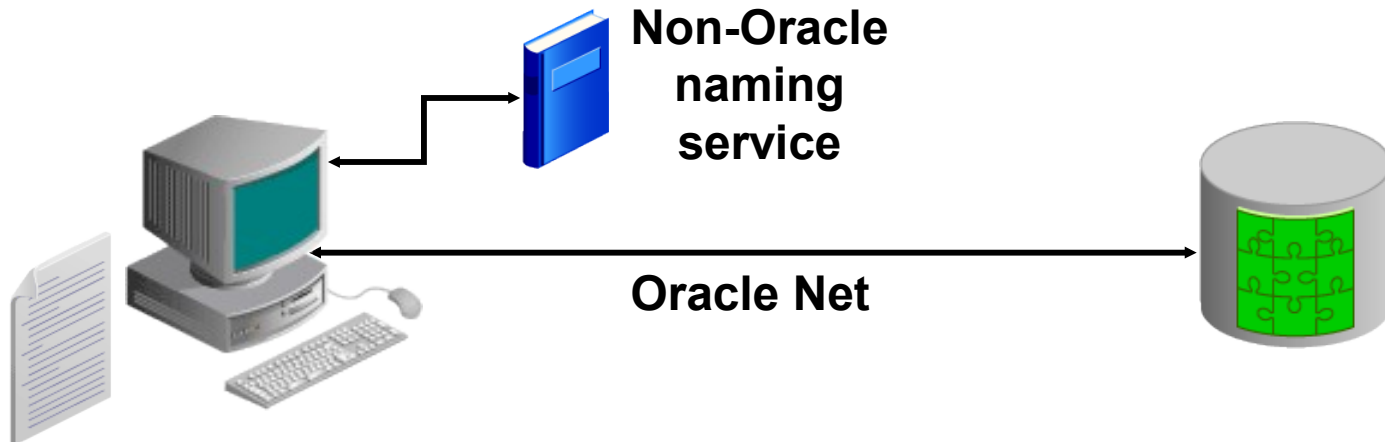
# Directory Naming

- 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.)	

**Value** **Hosts**

Value	Hosts
edrsr25p1.us.oracle.com	

# Advanced Connection Options

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

- Connect-time failover
- Source routing
- Load balancing

**Addresses**Add

Edit Remove Reorder Move To Top Go

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

**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
```

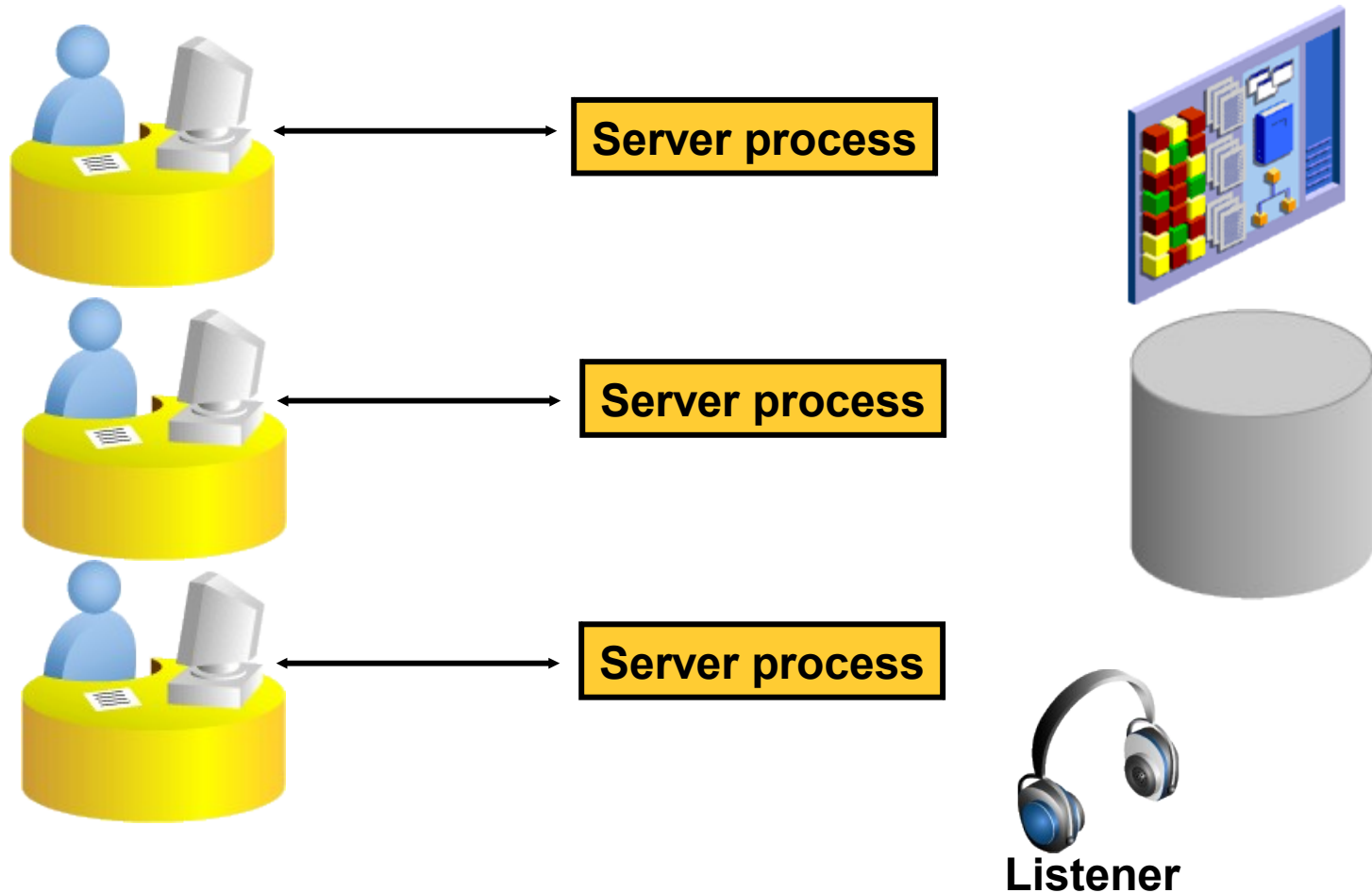
- Supports local and directory naming:

```
tnsping orcl
```

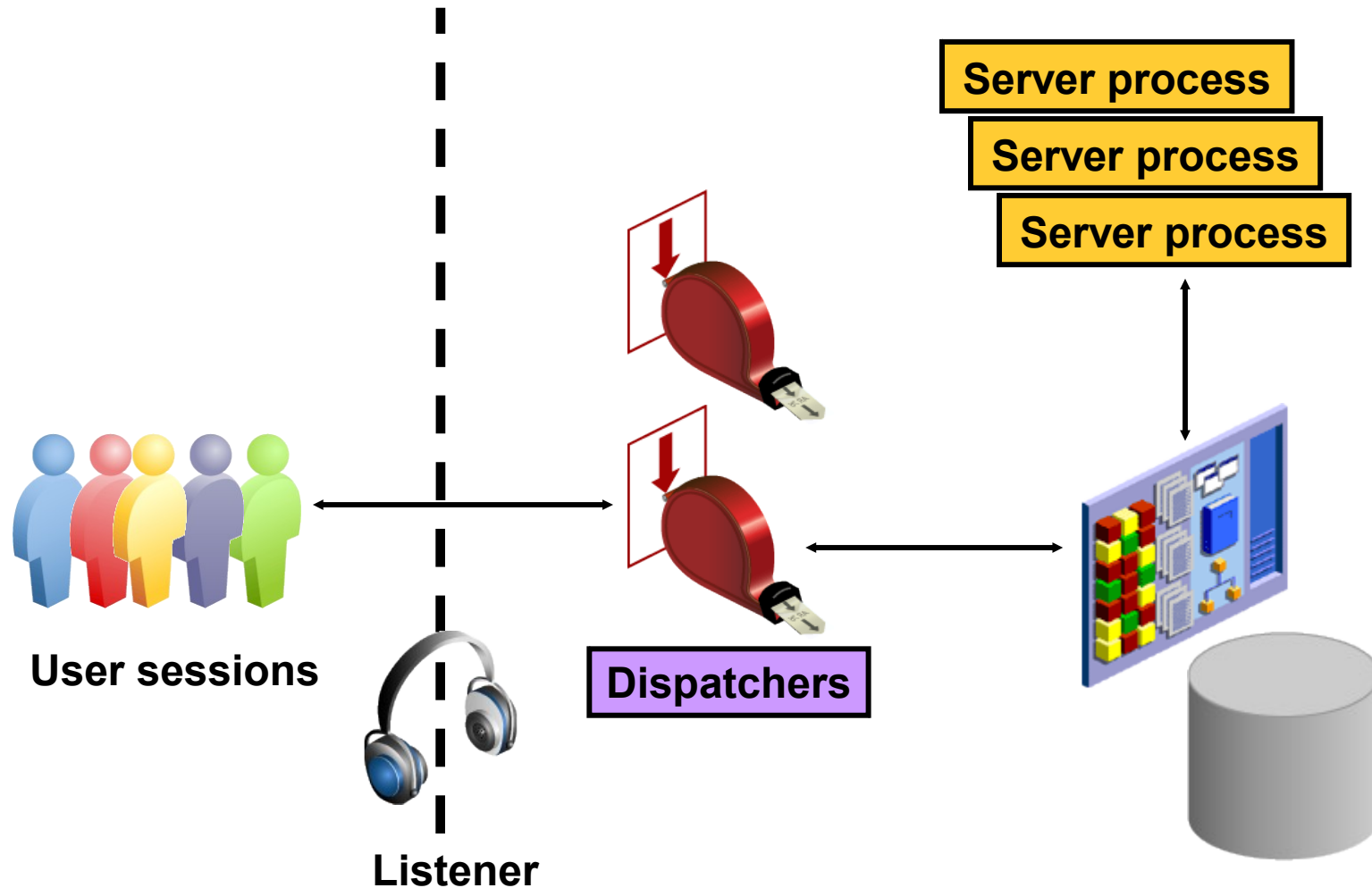


# User Sessions: Dedicated Server Process

User sessions

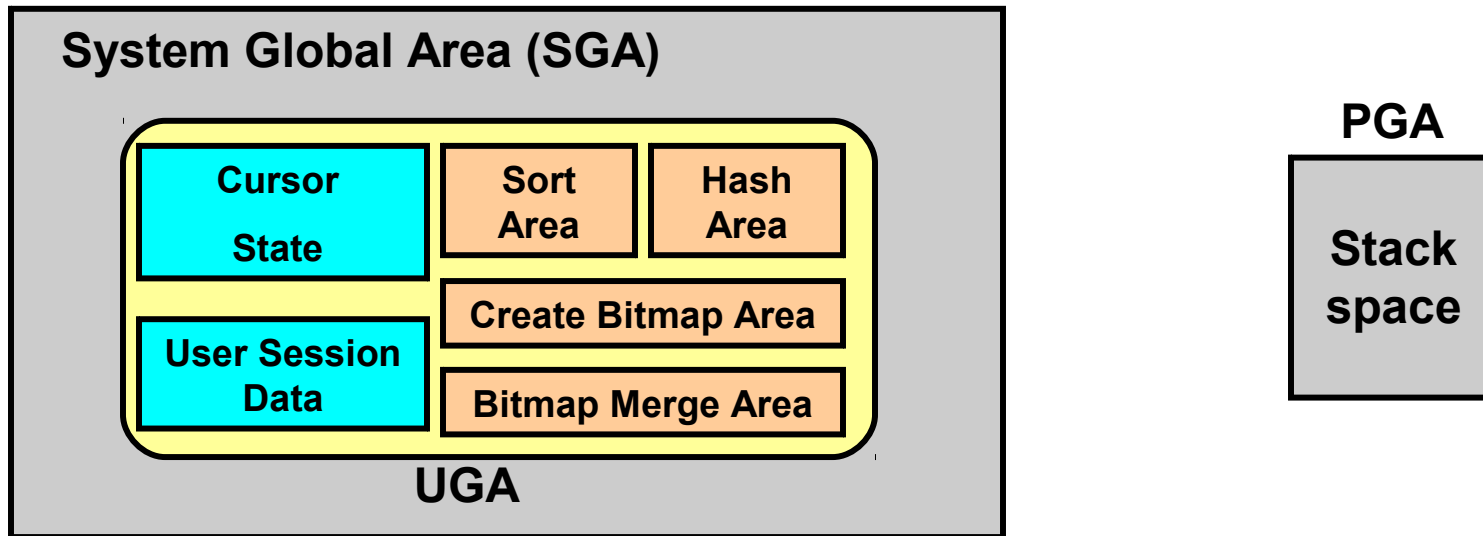


# User Sessions: Shared Server Processes



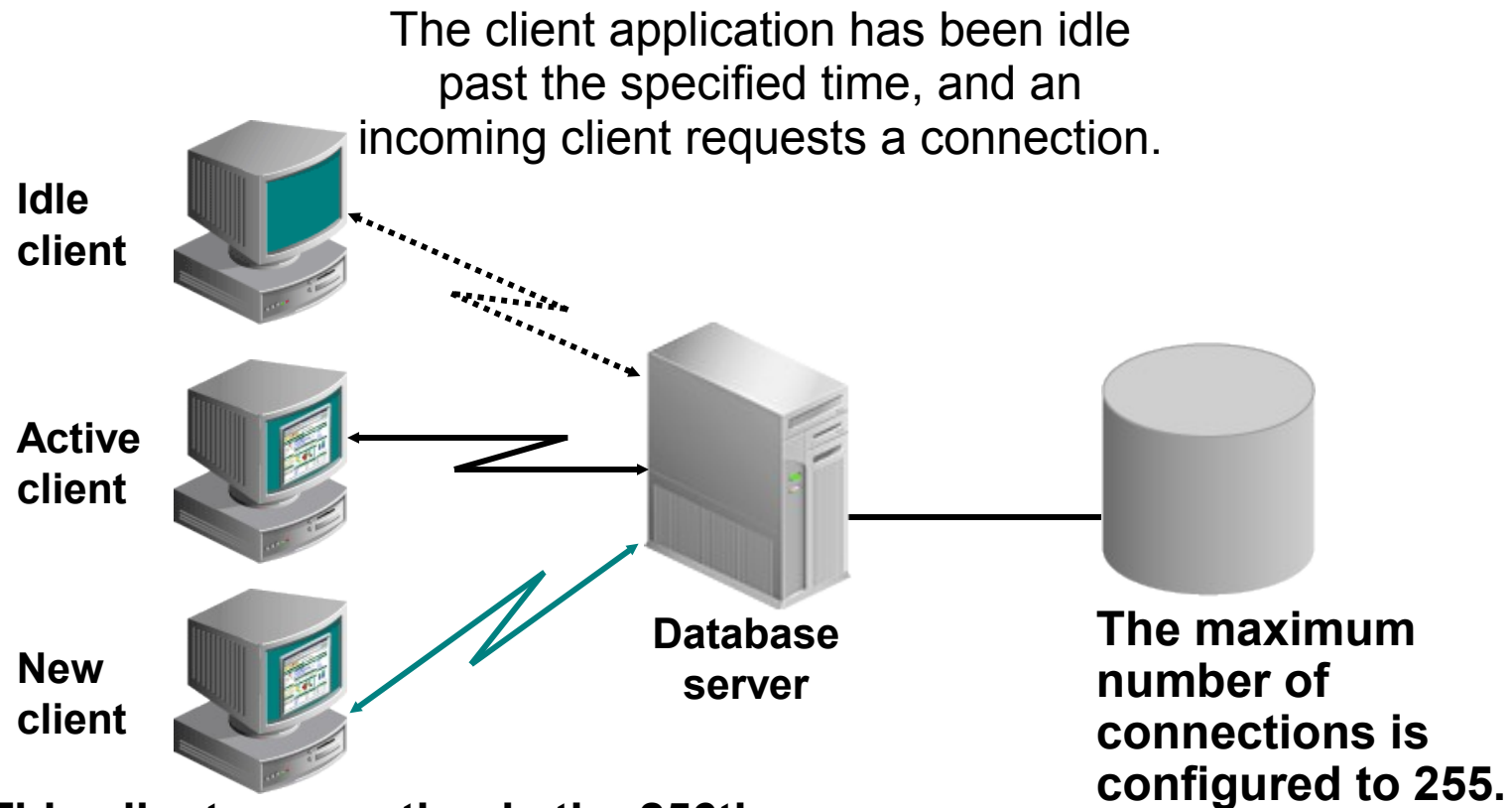
# SGA and PGA

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



**This client connection is the 256th connection into the server. Connection pooling is turned on so that this connection can be accepted.**

# 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