

## Lab 9.1: Exploring the Default Listener

### Objective:

To explore the configuration for the default listener, `LISTENER`, and understand dynamic service registration in your Oracle database environment. This lab uses the `CDBLAB` and its PDBs created in previous labs.

### Steps:

#### 1. Open a New Terminal and Set the Environment Variables for `CDBLAB`

Open a new terminal window and set the environment variables for the `CDBLAB` database:

```
. oraenv
ORACLE_SID = [oracle] ? CDBLAB
The Oracle base has been set to /u01/app/oracle
```

#### 2. Start SQL\*Plus and Log in as the SYS User with SYSDBA Privilege

Start SQL\*Plus and log in as the SYS user with the SYSDBA privilege:

```
sqlplus / as sysdba
```

#### 3. View Initialization Parameters for Dynamic Service Registration

a. **INSTANCE\_NAME:** This parameter identifies the database instance name.

```
SHOW PARAMETER INSTANCE_NAME;
```

##### Expected Output:

NAME	TYPE	VALUE
instance_name	string	CDBLAB

b. **SERVICE\_NAMES:** This parameter identifies the service names that users can use in their connection strings to connect to the database instance.

```
SHOW PARAMETER SERVICE_NAMES;
```

##### Expected Output:

NAME	TYPE	VALUE
service_names	string	CDBLAB

c. **LOCAL\_LISTENER:** This parameter specifies the alias names for local listeners that resolve to addresses in the `tnsnames.ora` file.

```
SHOW PARAMETER LOCAL_LISTENER;
```

##### Expected Output:

NAME	TYPE	VALUE
local_listener	string	LISTENER_CDBLAB

d. **REMOTE\_LISTENER**: This parameter specifies the alias names for remote listeners.

```
SHOW PARAMETER REMOTE_LISTENER;
```

**Expected Output:**

NAME	TYPE	VALUE
remote_listener	string	

#### 4. Exit SQL\*Plus

```
exit
```

#### 5. View the `tnsnames.ora` File and Locate the Entry for `LOCAL_LISTENER`

a. Change directories to `$ORACLE_HOME/network/admin` :

```
cd $ORACLE_HOME/network/admin
```

b. List the files in this directory:

```
ls -l
```

**Expected Output:**

```
-rw-r--r-- 1 oracle oinstall 287 Jun 27 2019 listener.ora
drwxr-xr-x 2 oracle oinstall 4096 Apr 17 2019 samples
-rw-r--r-- 1 oracle oinstall 1536 Feb 14 2018 shrept.lst
-rw-r----- 1 oracle oinstall 1870 Oct 16 05:06 tnsnames.ora
-rw-r----- 1 oracle oinstall 1870 Oct 16 22:05 tnsnames.old
```

c. View the `tnsnames.ora` file using the `less` command:

```
less tnsnames.ora
```

**Expected Content:**

```
LISTENER_CDBLAB =
  (ADDRESS = (PROTOCOL = TCP) (HOST = your_fully_qualified_hostname) (PORT =
1521))

CDBLAB =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = your_fully_qualified_hostname) (PORT =
1521))
    )
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = CDBLAB)
    )
  )
```

## 6. View the `listener.ora` File

View the `listener.ora` file using the `cat` command:

```
cat listener.ora
```

### Expected Content:

```
LISTENER =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = your_fully_qualified_hostname) (PORT =
1521))
  )

ADR_BASE_LISTENER = /u01/app/oracle
```

## 7. Start the Listener Control Utility

Start the Listener Control utility with the `lsnrctl` command:

```
lsnrctl
```

### Expected Output:

```
LSNRCTL for Linux: Version 19.0.0.0.0 - Production on 27-OCT-2020 13:56:52
Copyright (c) 1991, 2019, Oracle. All rights reserved.
Welcome to LSNRCTL, type "help" for information.
LSNRCTL>
```

## 8. View Information About the Default Listener

a. View the available operations:

```
LSNRCTL> help
```

b. View the name of the current listener:

```
LSNRCTL> show current_listener
```

### Expected Output:

```
Current Listener is LISTENER
```

c. View the status of `LISTENER` :

```
LSNRCTL> status
```

### Expected Output:

```
Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=your_fully_qualified_hostname) (PORT=1521)))
STATUS of the LISTENER
-----
Alias                                LISTENER
```

```

Version                TNSLSNR for Linux: Version 19.0.0.0.0 - Production
Start Date             27-OCT-2020 13:56:52
Uptime                0 days 0 hr. 0 min. 0 sec
Trace Level            off
Security              ON: Local OS Authentication
SNMP                  OFF
Listener Parameter File
/u01/app/oracle/product/19.3.0/dbhome_1/network/admin/listener.ora
Listener Log File
/u01/app/oracle/diag/tnslsnr/your_fully_qualified_hostname/listener/alert/log.xml

Listening Endpoints Summary...
  (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp) (HOST=your_fully_qualified_hostname)
(PORT=1521)))
Services Summary...
Service "CDBLAB" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
The command completed successfully

```

d. View additional details about the registered services:

```
LSNRCTL> services
```

**Expected Output:**

```

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=your_fully_qualified_hostname) (PORT=1521)))
Services Summary...
Service "CDBLAB" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
Service "PDB1" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
Service "PDB2" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
Service "PDB3" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
The command completed successfully

```

e. Show the log status:

```
LSNRCTL> show log_status
```

**Expected Output:**

```

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=your_fully_qualified_hostname) (PORT=1521)))
LISTENER parameter "log_status" set to ON
The command completed successfully

```

## 9. Exit the Listener Control Utility

```
LSNRCTL> exit
```

## Part B: Creating a Second Listener

### Overview:

In this practice, you create a listener named `LISTENER2` that listens on the non-default port 1561 for all database services. Configure the listener to use dynamic service registration, similar to the default listener, `LISTENER`.

### Steps:

#### 1. Open the `tnsnames.ora` File and Create an Entry for `LISTENER2`

- a. Set your environment variables using `oraenv` to `CDBLAB`:

```
. oraenv
ORACLE_SID = [orclcdb] ? CDBLAB
The Oracle base remains unchanged with value /u01/app/oracle
```

- b. Obtain your host name and domain:

```
hostname -f
```

### Expected Output:

```
your_fully_qualified_hostname
```

- c. Navigate to `$ORACLE_HOME/network/admin`:

```
cd $ORACLE_HOME/network/admin
```

- d. Copy the `tnsnames.ora` file and open it in a text editor:

```
cp tnsnames.ora tnsnames.ora.3-2
vi tnsnames.ora
```

- e. Add an entry for ``LISTENER2``:

```
LISTENER2 = (ADDRESS = (PROTOCOL = TCP)(HOST = your_fully_qualified_hostname)(PORT = 1561))
```

- f. Save the file and exit the editor.

#### 2. \*\*Modify the ``LOCAL_LISTENER`` Initialization Parameter\*\*

- a. Open a new terminal window and set the environment variables for ``CDBLAB``:

```
``sh
. oraenv
ORACLE_SID = [oracle] ? CDBLAB
The Oracle base has been set to /u01/app/oracle
```

- b. Start SQL\*Plus and log in as the SYS user with the SYSDBA privilege:

```
sqlplus / as sysdba
```

c. View the `LOCAL_LISTENER` initialization parameter:

```
SHOW PARAMETER local_listener;
```

**Expected Output:**

NAME	TYPE	VALUE
local_listener	string	LISTENER_CDBLAB

d. Check if the `LOCAL_LISTENER` parameter is a static or dynamic parameter:

```
SELECT isses_modifiable, issys_modifiable FROM v$parameter WHERE  
name='local_listener';
```

**Expected Output:**

ISSES	ISSYS_MOD
FALSE	IMMEDIATE

e. Set the `LOCAL_LISTENER` parameter to include both `LISTENER_CDBLAB` and `LISTENER2` :

```
ALTER SYSTEM SET local_listener='LISTENER_CDBLAB,LISTENER2';
```

**Expected Output:**

```
System altered.
```

f. Confirm the new value of the `LOCAL_LISTENER` parameter:

```
SHOW PARAMETER local_listener;
```

**Expected Output:**

NAME	TYPE	VALUE
local_listener	string	LISTENER_CDBLAB,LISTENER2

g. Exit SQL\*Plus:

```
exit
```

### 3. Add an Entry for `LISTENER2` in the `listener.ora` File

a. Make a copy of the `listener.ora` file:

```
cd $ORACLE_HOME/network/admin  
cp listener.ora listener.old
```

b. Start Oracle Net Manager:

```
netmgr
```

#### In Oracle Net Manager:

- Expand `Local` and then `Listeners`.
- Click the green plus sign to add a new listener.
- Enter `LISTENER2` as the listener name and click `OK`.
- Click `Add Address` and configure the address with the host name and port 1561.
- Save the network configuration and exit Oracle Net Manager.

c. Verify the new entry in the `listener.ora` file:

```
cat listener.ora
```

#### Expected Content:

```
LISTENER2 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = your_fully_qualified_hostname) (PORT =
1561))
  )

LISTENER =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = your_fully_qualified_hostname) (PORT =
1521))
  )

ADR_BASE_LISTENER = /u01/app/oracle
ADR_BASE_LISTENER2 = /u01/app/oracle
```

#### 4. Start and Verify the New Listener ( `LISTENER2` )

a. Start the Listener Control utility:

```
lsnrctl
```

b. Check the status of `LISTENER2` :

```
LSNRCTL> status LISTENER2
```

#### Expected Output:

```
Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=your_fully_qualified_hostname) (PORT=1561)))
TNS-12541: TNS:no listener
TNS-12560: TNS:protocol adapter error
TNS-00511: No listener
Linux Error: 111: Connection refused
```

c. Start `LISTENER2` :

```
LSNRCTL> start LISTENER2
```

### Expected Output:

```
Starting /u01/app/oracle/product/19.3.0/dbhome_1/bin/tnslsnr: please wait...
TNSLSNR for Linux: Version 19.0.0.0.0 - Production
System parameter file is
/u01/app/oracle/product/19.3.0/dbhome_1/network/admin/listener.ora
Log messages written to
/u01/app/oracle/diag/tnslsnr/your_fully_qualified_hostname/listener2/alert/log.xml

Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)
(HOST=your_fully_qualified_hostname) (PORT=1561)))
The command completed successfully
```

d. Check the status of `LISTENER2` again after waiting for about 60 seconds:

```
LSNRCTL> status LISTENER2
```

### Expected Output:

```
Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)
(HOST=your_fully_qualified_hostname) (PORT=1561)))
STATUS of the LISTENER
-----
Alias listener2
Version TNSLSNR for Linux: Version 19.0.0.0.0 - Production
Start Date 16-OCT-2020 23:27:54
Uptime 0 days 0 hr. 0 min. 55 sec
Trace Level off
Security ON: Local OS Authentication
SNMP OFF
Listener Parameter File
/u01/app/oracle/product/19.3.0/dbhome_1/network/admin/listener.ora
Listener Log File
/u01/app/oracle/diag/tnslsnr/your_fully_qualified_hostname/listener2/alert/log.xml

Listening Endpoints Summary...
(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp) (HOST=your_fully_qualified_hostname)
(PORT=1561)))
Services Summary...
Service "CDBLAB" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
Service "PDB1" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
Service "PDB2" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
Service "PDB3" has 1 instance(s).
  Instance "CDBLAB", status READY, has 1 handler(s) for this service...
The command completed successfully
```

## 5. Exit the Listener Control Utility

```
LSNRCTL> exit
```



## Summary

In this lab, you explored the configuration for the default listener, `LISTENER`, and dynamic service registration. You then created a new listener named `LISTENER2` that listens on the non-default port 1561, configured it for dynamic service registration, and verified its operation. This practice ensures you understand the configuration and management of multiple listeners in an Oracle database environment.

## Part C: Connecting to a Database Service Using the New Listener

### Overview:

Now that you have `LISTENER2` configured, test it by making a connection to one of its supported database services, for example, `CDBLAB`.

### Steps:

#### 1. Using Easy Connect Syntax, Start SQL\*Plus and Connect to the CDB Using `LISTENER2`

Open a terminal and connect to the `CDBLAB` database using `LISTENER2` on port 1561:

```
sqlplus system/password@localhost:1561/CDBLAB
```

#### Expected Output:

```
SQL*Plus: Release 19.0.0.0.0 - Production on Tue Oct 27 13:56:52 2020
Version 19.0.0.0.0

Copyright (c) 1982, 2020, Oracle. All rights reserved.

Enter password: *****
Connected to:
Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 - Production
Version 19.0.0.0.0

SQL>
```

#### 2. Exit SQL\*Plus and Close the Terminal Window

Exit SQL\*Plus:

```
exit
```

Close the terminal window:

```
exit
```

## Summary

In this part, you tested the newly configured `LISTENER2` by making a connection to the `CDBLAB` database using Easy Connect syntax. This verifies that `LISTENER2` is correctly configured and can handle connections to the specified database services.