# Practices for Lesson 9: Configuring and Administering the Listener

Practices for Lesson 9: Overview

Overview

In these practices, you will create a new listener and verify that you can connect to a database by using the new listener.

Practice 9-1: Exploring the Default Listener

Overview

In this practice, you explore the configuration for the default listener, LISTENER, and dynamic service registration.

Assumptions

The practice assumes that the database and listener are running and may have been started in a previous practice.

The database and listener are NOT automatically started when the VM is started. A script

dbstart.sh is provided to start the database and listener when needed.

The OS command pgrep -lf smon will show any databases that are started, and pgrep -lf tns will report any listener processes that are running.

Tasks

Open a new terminal window and use oraenv to set the environment variables for the

ORCLCDB database.

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

View the initialization parameters used during dynamic service registration.

INSTANCE\_NAME: This parameter identifies the database instance name. It defaults to the Oracle System Identifier (SID) of the database instance. The results show that the database instance name is orclcdb, which was named during installation.

SERVICE\_NAMES: This parameter identifies the service names that users can use in their connection strings to connect to the database instance. By default, the service name takes on the same name as the global database name, orclcdb.example.com, which is a combination of the DB\_NAME parameter (orclcdb) and the DB\_DOMAIN parameter (example.com). If the DB\_DOMAIN parameter is blank so will the domain portion of the SERVICE\_NAME. The SERVICE\_NAMES parameter can accept multiple comma-separated values if you want to provide users with a variety of service names for the database instance. Doing so helps you control and monitor different user groups in Oracle Database Resource Manager.

LOCAL\_LISTENER: This parameter specifies the alias names for local listeners that resolve to addresses in the tnsnames.ora file (or other address repository as configured for your system). If there are multiple aliases, they must be separated by commas and all values enclosed by one set of double quotation marks. The results show one alias, LISTENER\_ORCLCDB (LISTENER\_<SID>). Keep in mind that this isn't the name of the listener. It's an alias for it.

REMOTE\_LISTENER: This parameter specifies the alias names for remote listeners (listeners on different machines than the database instance). If there are multiple aliases, they must be separated by commas and all values enclosed by one set of double quotation marks. The results show that you do not have any remote listeners because the value is null.

Exit SQL\*Plus.

View the server-side tnsnames.ora file and locate the entry that resolves the

LOCAL\_LISTENER parameter value, which is the LISTENER\_ORCLCDB alias.

Change directories to $ORACLE\_HOME/network/admin.

List the files in this directory. The tnsnames.ora file is listed.

View the tnsnames.ora file by using the less command (case matters). The entry for the LISTENER\_ORCLCDB alias contains one protocol address, which consists of a host name, port number (1521, which is the default port number), and protocol (TCP). The protocol address is the listener's "end point." A listener end point does not contain a listener name or a CONNECT\_DATA section like the ORCLPDB1 and ORCLCDB entries.

**Note:** less uses vi like key commands to move about the file. End the less session with 'q'.

RCATCDB = (DESCRIPTION =

(ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = edvmr1p0)(PORT = 1521))

) (CONNECT\_DATA =

(SERVER = DEDICATED)

(SERVICE\_NAME = rcatcdb)

)

)

LISTENER\_RCATCDB =

(ADDRESS = (PROTOCOL = TCP)(HOST = edvmr1p0)(PORT = 1521))

MYPDB1 = (DESCRIPTION =

(ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST =

edvmr1p0.us.oracle.com)(PORT = 1521))

) (CONNECT\_DATA =

(SERVICE\_NAME = ORCLPDB1)

)

)

ORCLPDB2 = (DESCRIPTION =

(ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))

) (CONNECT\_DATA =

(SERVICE\_NAME = orclpdb2)

)

)

ORCLPDB1 = (DESCRIPTION =

(ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))

)

(CONNECT\_DATA =

(SERVICE\_NAME = orclpdb1)

)

)

RCATPDB = (DESCRIPTION =

(ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))

) (CONNECT\_DATA =

(SERVICE\_NAME = rcatpdb)

)

)

PDB3 =

(DESCRIPTION = (ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))

) (CONNECT\_DATA =

(SERVICE\_NAME = orclpdb3)

)

)

TESTORCL = (DESCRIPTION =

(ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST =

edvmr1p0.us.oracle.com)(PORT = 1521))

) (CONNECT\_DATA =

(SERVICE\_NAME = cdbtest)

)

)

CDBTEST = (DESCRIPTION =

(ADDRESS\_LIST =

(ADDRESS = (PROTOCOL = TCP)(HOST = edvmr1p0)(PORT = 1521))

)

View the listeners.ora file by using the cat command. This file contains the listeners created on the machine. So far, you have one listener, which is the default listener.

When you start the Listener Control utility, it connects to the named listener or the default listener (LISTENER) if you leave out the name. To connect, the Listener Control utility obtains the protocol address(es) for the listener by resolving the listener name with one of the following mechanisms:

listener.ora file in the directory specified by the TNS\_ADMIN environment variable. This is why it's important to set the environment variables to the appropriate home before using the Listener Control utility, which you did at the beginning of this practice.

listener.ora file in the $ORACLE\_HOME/network/admin directory

Naming method, for example, a tnsnames.ora file

If the listener name is LISTENER and it cannot be resolved, a protocol address of TCP/IP, port 1521 is assumed.

Start the Listener Control utility with the lsnrctl command. Without specifying a listener name, the utility assumes you want to connect to the default listener, LISTENER.

View information about the default listener by using the Listener Control utility.

View the operations that are available by using the help command.

View the name of the current listener by using the show command and the current\_listener parameter. You can set the current\_listener parameter to facilitate managing a particular listener. With it set to a particular listener, you don't need to specify the listener's name after each command. The utility will automatically execute all commands against that listener. If you want to work on a different listener, you can either set the current\_listener parameter to the other listener's name by using the SET current\_listener command or you can include the other listener's name after each command. Currently, the default listener is set to LISTENER.

View the status of LISTENER by using the status command. This command displays basic information about the listener, including its alias name (LISTENER), its version, when it was last started (Start Date), how long it’s been running for (Uptime), whether tracing is turned on (Trace Level), whether OS authentication is enabled (Security), whether SNMP is on, the location of the listener parameter file and log file, listener end

points, the wallet directory, and a list of registered services and whether they are ready.

LSNRCTL> **status**

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=edvmr1p0)(PORT=1521)))

STATUS of the LISTENER

Alias LISTENER

Version TNSLSNR for Linux: Version 19.0.0.0.0

- Production

Start Date 15-OCT-2020 17:51:18

Uptime 1 days 5 hr. 17 min. 29 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.o ra

Listener Log File

/u01/app/oracle/diag/tnslsnr/edvmr1p0/listener/alert/log.xml Listening Endpoints Summary...

(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com

)(PORT=1521)))

(DESCRIPTION=(ADDRESS=(PROTOCOL=tcps)(HOST=edvmr1p0.us.oracle.co m)(PORT=5502))(Security=(my\_wallet\_directory=/u01/app/oracle/adm in/CDBTEST/xdb\_wallet))(Presentation=HTTP)(Session=RAW))

(DESCRIPTION=(ADDRESS=(PROTOCOL=tcps)(HOST=edvmr1p0.us.oracle.co m)(PORT=5500))(Security=(my\_wallet\_directory=/u01/app/oracle/adm in/orclcdb/xdb\_wallet))(Presentation=HTTP)(Session=RAW))

Services Summary...

Service "86b637b62fdf7a65e053f706e80a27ca" has 1 instance(s).

Instance "orclcdb", status READY, has 1 handler(s) for this service...

Service "8857b36632797e5ce0536210ed0adac7" has 1 instance(s).

Instance "orclcdb", status READY, has 1 handler(s) for this service...

Service "8857b419bf707e73e0536210ed0a54c7" has 1 instance(s).

Instance "orclcdb", status READY, has 1 handler(s) for this service...

Service "CDBDEV" has 1 instance(s).

Instance "CDBDEV", status READY, has 1 handler(s) for this service...

Service "CDBDEVXDB" has 1 instance(s).

Instance "CDBDEV", status READY, has 1 handler(s) for this service...

Service "CDBTEST" has 1 instance(s).

Instance "CDBTEST", status READY, has 1 handler(s) for this service...

Service "CDBTESTXDB" has 1 instance(s).

Instance "CDBTEST", status READY, has 1 handler(s) for this service...

Service "orclcdb" has 1 instance(s).

Instance "orclcdb", status READY, has 1 handler(s) for this service...

Service "orclcdbXDB" has 1 instance(s).

Instance "orclcdb", status READY, has 1 handler(s) for this service...

Service "orclpdb1" has 1 instance(s).

Instance "orclcdb", status READY, has 1 handler(s) for this service...

Service "orclpdb2" has 1 instance(s).

Instance "orclcdb", status READY, has 1 handler(s) for this service...

The command completed successfully LSNRCTL>

**Note:** Wallets are certificates, keys, and trustpoints processed by SSL that allow for secure connections.

The alias name for the listener is the name that was given to the listener during

ORCLCDB creation in DBCA. This alias is entered into the listeners.ora file.

If you had named the listener something other than LISTENER during CDB creation, the Alias value would reflect the other name.

To view additional details about the registered services, issue the services command. The results tell you that there are several database services configured for the current listener, three of which are the orclcdb, orclpdb1, orclpdb2 services. If the status value for the database instance associated with the database service is UNKNOWN, you know that the LREG process is not communicating with the listener and, therefore, there is no dynamic service registration going on. If the status is READY, then you know that dynamic service registration is going on.

service...

Handler(s):

"DEDICATED" established:2 refused:0 state:ready LOCAL SERVER

"D000" established:0 refused:0 current:0 max:1022 state:ready

DISPATCHER <machine: edvmr1p0, pid: 24346>

(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com)(PORT=12335)

)

Service "8857b36632797e5ce0536210ed0adac7" has 1 instance(s).

Instance "orclcdb", status READY, has 2 handler(s) for this service...

Handler(s):

"DEDICATED" established:2 refused:0 state:ready LOCAL SERVER

"D000" established:0 refused:0 current:0 max:1022 state:ready

DISPATCHER <machine: edvmr1p0, pid: 24346>

(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com)(PORT=12335)

)

Service "8857b419bf707e73e0536210ed0a54c7" has 1 instance(s).

Instance "orclcdb", status READY, has 2 handler(s) for this service...

Handler(s):

"DEDICATED" established:2 refused:0 state:ready LOCAL SERVER

"D000" established:0 refused:0 current:0 max:1022 state:ready

DISPATCHER <machine: edvmr1p0, pid: 24346>

(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com)(PORT=12335)

)

Service "CDBDEV" has 1 instance(s).

Instance "CDBDEV", status READY, has 1 handler(s) for this service...

Handler(s):

"DEDICATED" established:0 refused:0 state:ready LOCAL SERVER

Service "CDBDEVXDB" has 1 instance(s).

Instance "CDBDEV", status READY, has 1 handler(s) for this service...

Handler(s):

"D000" established:0 refused:0 current:0 max:1022

state:ready

DISPATCHER <machine: edvmr1p0, pid: 27937>

(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com)(PORT=33359)

)

Service "CDBTEST" has 1 instance(s).

Instance "CDBTEST", status READY, has 1 handler(s) for this service...

Handler(s):

"DEDICATED" established:4 refused:0 state:ready LOCAL SERVER

Service "CDBTESTXDB" has 1 instance(s).

Instance "CDBTEST", status READY, has 1 handler(s) for this service...

Handler(s):

"D000" established:0 refused:0 current:0 max:1022 state:ready

DISPATCHER <machine: edvmr1p0, pid: 30421>

(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com)(PORT=18685)

)

Service "orclcdb" has 1 instance(s).

Instance "orclcdb", status READY, has 2 handler(s) for this service...

Handler(s):

"DEDICATED" established:2 refused:0 state:ready LOCAL SERVER

"D000" established:0 refused:0 current:0 max:1022 state:ready

DISPATCHER <machine: edvmr1p0, pid: 24346>

(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com)(PORT=12335)

)

Service "orclcdbXDB" has 1 instance(s).

Instance "orclcdb", status READY, has 0 handler(s) for this service...

Service "orclpdb1" has 1 instance(s).

Instance "orclcdb", status READY, has 2 handler(s) for this service...

Handler(s):

"DEDICATED" established:2 refused:0 state:ready LOCAL SERVER

"D000" established:0 refused:0 current:0 max:1022 state:ready

DISPATCHER <machine: edvmr1p0, pid: 24346>

The Handler(s) section contains the information about the dispatcher or the dedicated server process.

In this case, it tells you the listener creates a DEDICATED server process for each service. The established and refused values count the number of successful and unsuccessful connections to the database service, and the state value tells you whether the handler is available (ready) or not.

Show the log status. The status is ON, which means the listener activity is being logged.

Exit the Listener Control utility and close the terminal window.

Practice 9-2: 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.

Assumptions

You are logged in as the oracle user.

Tasks

Open the tnsnames.ora file and create an entry that resolves a LISTENER2 alias to a protocol address.

Set your environment variables using oraenv to orclcdb

Obtain your host name and domain. The format is host.domain

Browse to $ORACLE\_HOME/network/admin.

Copy the tnsnames.ora file to tnsnames.ora.3-2 and then open tnsnames.ora

in gedit.

Using the editor of your choice, add an entry to the tnsnames.ora file for LISTENER2 to resolve the alias to a protocol address, similar to the LISTENER\_ORCLCDB entry. You can copy and paste the LISTENER\_ORCLCDB as a starting point. Specify your host and domain for the host name discovered in *step 1b*, 1561 for the port number, and TCP as the protocol. The vi editor is shown here.

Save the file and then exit the editor. Hint: vi wite & quit is **:wq!**

Modify the LOCAL\_LISTENER initialization parameter to include both LISTENER\_ORCLCDB

and LISTENER2 aliases.

Open a new terminal window and use oraenv to set the environment variables for the

orclcdb database.

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

View the LOCAL\_LISTENER initialization parameter. The value LISTENER\_ORCLCDB is the alias name for the default listener. During dynamic service registration, the LREG process obtains the location of listeners by resolving aliases in the LOCAL\_LISTENER and REMOTE\_LISTENER parameters to entries in the tnsnames.ora file.

Check if the LOCAL\_LISTENER parameter is a static or dynamic parameter by querying the V$PARAMETER view. The results tell you that you can't change its value at the session level, but you can at the system level, and the change will take effect immediately. This means that the LOCAL\_LISTENER parameter is a dynamic

system-level parameter.

Set the LOCAL\_LISTENER parameter equal to LISTENER\_ORCLCDB and LISTENER2 by using the ALTER SYSTEM command. The change is made to the current instance and is effective immediately.

Confirm that LISTENER\_ORCLCDB and LISTENER2 are values for the

LOCAL\_LISTENER initialization parameter.

Exit SQL\*Plus. Keep the terminal window open because you will return to it later in the practice.

To manage LISTENER2 with the Listener Control utility, you need to add an entry in the listener.ora file so that the utility knows how to connect to LISTENER2. In this task, you will use Oracle Net Manager to add the entry. It's important to remember that dynamic service registration does not make use of the listener.ora file; however, you do need to configure the file if you want to manage listeners with the Listener Control utility.

Make a copy of the listener.ora file; call it listener.old

In the terminal window, start Oracle Net Manager. Use **netmgr** command.

In the Oracle Net Manager navigation pane, expand **Local** and then **Listeners**. The default listener, LISTENER, is listed. Select **Listeners** and click the green plus sign to begin defining a new listener.

In the Choose Listener Name dialog box, enter **LISTENER2** and click **OK**. LISTENER2

is added to the list of listeners.

With LISTENER2 selected on the left side, click **Add Address**.

In the Address1 panel on the right, leave Listening Locations selected in the drop-down list, leave TCP/IP selected as the protocol, and set the host name to **your host and domain**. In the Port box, enter **1561**.

For interest, select **General Parameters** from the drop-down list. Review the configuration options on the General, Logging & Tracing, and Authentication tabs.

Select **Database Services** from the drop-down list. There are no databases currently configured for the listener.

Select **File** and then **Save Network Configuration**.

Select **File** and then **Exit** to exit Oracle Net Manager. You just added an entry into the

listeners.ora file.

Change directory (cd) to **$ORACLE\_HOME/network/admin**

(/u01/app/oracle/product/<version>/dbhome\_1/network/admin).

View the listener.ora file with the cat utility. Notice that the entry for LISTENER2 is added to the file at the top and is configured with the protocol address that you just specified in Oracle Net Manager.

Using the Listener Control utility, check the status of LISTENER2.

In the terminal window, start the Listener Control utility.

Check the status of LISTENER2 by issuing the status command. Your results indicate "no listener" and "Connection refused" because you just created the listener and need to start it.

Start LISTENER2 by issuing the start LISTENER2 command. The status indicates that the listener does not support any services.

LSNRCTL> **start listener2**

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.o ra

Log messages written to

/u01/app/oracle/diag/tnslsnr/edvmr1p0/listener2/alert/log.xml

Listening on: (DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com

)(PORT=1561)))

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=edvmr1p0.us.oracle.com

)(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. 0 sec

Trace Level off

Security ON: Local OS Authentication

SNMP OFF

Listener Parameter File

Question: Why do you think the listener is not supporting any services?

Answer: One reason might be that the LREG process hasn't had enough time to dynamically update the list of services for the listener yet.

Wait about 60 seconds and then check the status of LISTENER2 again. By then, the

LREG process will have time to register the database services with your listener.

LSNRCTL> **status listener2**

Connecting to (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=edvmr1p0.us.oracle.com

)(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.o ra

Listener Log File

/u01/app/oracle/diag/tnslsnr/edvmr1p0/listener2/alert/log.xml Listening Endpoints Summary...

(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp)(HOST=edvmr1p0.us.oracle.com

)(PORT=1561)))

Services Summary...

Service "86b637b62fdf7a65e053f706e80a27ca" has 1 instance(s).

Instance "orclcdb", status READY, has 1 handler(s) for this service...

Exit the Listener Control utility.

Practice 9-3: 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, orclcdb.

Tasks

Using Easy Connect syntax, start SQL\*Plus and connect to the CDB using LISTENER2. Make sure to specify the non-default port number 1561. See *Course Practice Environment: Security Credentials* for the password.

**Note:** The service name would usually include the domain name as specified in the value of the db\_domain initialization parameter. The domain value is blank in your deployment.

Exit SQL\*Plus and close the terminal window.