Lab 6.0: Setting Up Environment and Configuring Listener and TNS Names

Objective:

To set environment variables, start the CDBLAB, check the PDBs, use the information to configure `tnsnames.ora` and `listener.ora`, ensuring nothing is in an UNKNOWN state when running `lsnrctl status`, and verify the configuration using `tnsping`.

Steps:

1. **Open the Terminal and Set Environment Variables:**

```
export ORACLE_BASE=/u01/app/oracle
export ORACLE_HOME=/u01/app/oracle/product/19.3.0/dbhome_1
export ORACLE_SID=CDBLAB
export PATH=$ORACLE_HOME/bin:$PATH
```

   Explanation: These environment variables set the Oracle base directory, Oracle home directory, the SID for the CDBLAB, and add the Oracle binaries to the system path.

2. **Start SQL*Plus:**

```
sqlplus / as sysdba
```

   Explanation: This command opens SQL*Plus with SYSDBA privileges.

3. **Start the CDBLAB:**

```
STARTUP;
```

   Explanation: This command starts the CDBLAB database.

4. **Check the Status of PDBs:**

```
SELECT con_id, name, open_mode FROM v$pdbs;
```

   Explanation: This query checks the status of all PDBs in the CDBLAB and identifies the available PDBs.

5. **Open Each PDB Individually in Read Write Mode:**

   Explanation: This section ensures each PDB is opened in read write mode. Replace the PDB names with the actual names obtained from the previous query.

```
ALTER PLUGGABLE DATABASE pdb_name OPEN READ WRITE;
```

   Repeat the above command for each PDB identified in step 4.

6. **Configure `listener.ora`:**

   Explanation: Edit the `listener.ora` file to include entries for CDBLAB and all identified PDBs.

   Open `listener.ora`:

```
vi /u01/app/oracle/product/19.3.0/dbhome_1/network/admin/listener.ora
```

   Add the following entries, updating them with the actual PDB names obtained from step 4:

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

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (GLOBAL_DBNAME = CDBLAB)
      (SID_NAME = CDBLAB)
      (ORACLE_HOME = /u01/app/oracle/product/19.3.0/dbhome_1)
    )
    (SID_DESC =
      (GLOBAL_DBNAME = pdb_name1)
      (SID_NAME = pdb_name1)
      (ORACLE_HOME = /u01/app/oracle/product/19.3.0/dbhome_1)
    )
    (SID_DESC =
      (GLOBAL_DBNAME = pdb_name2)
      (SID_NAME = pdb_name2)
      (ORACLE_HOME = /u01/app/oracle/product/19.3.0/dbhome_1)
    )
    (SID_DESC =
      (GLOBAL_DBNAME = pdb_name3)
      (SID_NAME = pdb_name3)
      (ORACLE_HOME = /u01/app/oracle/product/19.3.0/dbhome_1)
    )
    (SID_DESC =
      (GLOBAL_DBNAME = pdb_name4)
      (SID_NAME = pdb_name4)
      (ORACLE_HOME = /u01/app/oracle/product/19.3.0/dbhome_1)
    )
  )
```

Note: Replace `pdb_name1`, `pdb_name2`, `pdb_name3`, and `pdb_name4` with the actual names of your PDBs.

7. **Configure `tnsnames.ora`:**

   Explanation: Edit the `tnsnames.ora` file to include entries for CDBLAB and all identified PDBs.

   Open `tnsnames.ora`:

   ```
   vi /u01/app/oracle/product/19.3.0/dbhome_1/network/admin/tnsnames.ora
   ```

   Add the following entries, updating them with the actual PDB names obtained from step 4:

   ```
   CDBLAB =
     (DESCRIPTION =
       (ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))
       (CONNECT_DATA =
   ```

```
      (SERVER = DEDICATED)
      (SERVICE_NAME = CDBLAB)
    )
  )

pdb_name1 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = pdb_name1)
    )
  )

pdb_name2 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = pdb_name2)
    )
  )

pdb_name3 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = pdb_name3)
    )
  )

pdb_name4 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = localhost)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = pdb_name4)
    )
  )
```

Note: Replace `pdb_name1`, `pdb_name2`, `pdb_name3`, and `pdb_name4` with the actual names of your PDBs.

8. **Reload the Listener:**

```
lsnrctl reload
```

Explanation: This command reloads the listener with the new configuration.

9. **Verify Listener Status:**

```
lsnrctl status
```

Explanation: This command checks the status of the listener to ensure all services are known.

10. **Test Connections with `tnsping`:**

    Explanation: Use `tnsping` to verify the connectivity to each service.

    ```
    tnsping CDBLAB
    tnsping pdb_name1
    tnsping pdb_name2
    tnsping pdb_name3
    tnsping pdb_name4
    ```

    Note: Replace `pdb_name1`, `pdb_name2`, `pdb_name3`, and `pdb_name4` with the actual names of your PDBs.

Detailed Example:

1. **Open the Terminal and Set Environment Variables:**

    ```
    export ORACLE_BASE=/u01/app/oracle
    export ORACLE_HOME=/u01/app/oracle/product/19.3.0/dbhome_1
    export ORACLE_SID=CDBLAB
    export PATH=$ORACLE_HOME/bin:$PATH
    ```

2. **Start SQL*Plus:**

    ```
    sqlplus / as sysdba
    ```

3. **Start the CDBLAB:**

    ```
    STARTUP;
    ```

4. **Check the Status of PDBs:**

    ```
    SELECT con_id, name, open_mode FROM v$pdbs;
    ```

5. **Open Each PDB Individually in Read Write Mode:**

    ```
    ALTER PLUGGABLE DATABASE pdb_name OPEN READ WRITE;
    ```

    Repeat the above command for each PDB identified in step 4.

6. **Configure `listener.ora`:**

    Open `listener.ora`:

    ```
    vi /u01/app/oracle/product/19.3.0/dbhome_1/network/admin/listener.ora
    ```

    Add the entries, updating them with the actual PDB names obtained from step 4.

7. **Configure `tnsnames.ora`:**

    Open `tnsnames.ora`:

    ```
    vi /u01/app/oracle/product/19.3.0/dbhome_1/network/admin/tnsnames.ora
    ```

Add the entries, updating them with the actual PDB names obtained from step 4.

8. **Reload the Listener:**

```
lsnrctl reload
```

9. **Verify Listener Status:**

```
lsnrctl status
```

10. **Test Connections with `tnsping`:**

```
tnsping CDBLAB
tnsping pdb_name1
tnsping pdb_name2
tnsping pdb_name3
tnsping pdb_name4
```

Explanation:

- **Setting Environment Variables:** Ensures the Oracle environment is correctly configured for operations.
- **Starting SQL*Plus:** Provides access to the database with SYSDBA privileges.
- **Starting the CDBLAB and Checking PDBs:** Ensures all databases are up and running.
- **Opening PDBs in Read Write Mode:** Ensures each PDB is accessible for operations.
- **Configuring `listener.ora` and `tnsnames.ora`:** Ensures proper network configuration for

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

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (SID_NAME = CDBLAB)
      (ORACLE_HOME = /u01/app/oracle/product/19.0.0/dbhome_1)
    )
    (SID_DESC =
      (SID_NAME = PDBLAB1)
      (ORACLE_HOME = /u01/app/oracle/product/19.0.0/dbhome_1)
      (SERVICE_NAME = PDBLAB1)
    )
    (SID_DESC =
      (SID_NAME = PDBLAB2)
      (ORACLE_HOME = /u01/app/oracle/product/19.0.0/dbhome_1)
      (SERVICE_NAME = PDBLAB2)
    )
    (SID_DESC =
      (SID_NAME = PDB4_CDBLAB)
      (ORACLE_HOME = /u01/app/oracle/product/19.0.0/dbhome_1)
```

```
      (SERVICE_NAME = PDB4_CDBLAB)
    )
    (SID_DESC =
      (SID_NAME = PDB_LAB3_CDBLAB)
      (ORACLE_HOME = /u01/app/oracle/product/19.0.0/dbhome_1)
      (SERVICE_NAME = PDB_LAB3_CDBLAB)
    )
  )
```