Lab 7.4: Setting Up and Understanding AWR (Automatic Workload Repository)

Objective:

To configure and understand the Automatic Workload Repository (AWR), generate snapshots, and create an AWR report using SQL Developer.

Prerequisites:

- Oracle Database 19c or higher.
- SQL Developer installed and configured to connect to the Oracle database.
- Access to SYSDBA privileges.

Steps:

1. Configure AWR Snapshot Settings

a. Check Current Snapshot Settings

1. **Connect to the Database as SYSDBA:**
    - Open SQL Developer and connect to your CDB as SYSDBA.
    - Connection details:
        - **Connection Name:** SYSDBA_CDBLAB
        - **Username:** sys
        - **Password:** fenago
        - **Connection Type:** Basic
        - **Role:** SYSDBA
        - **Hostname:** localhost
        - **Port:** 1521
        - **Service Name:** CDBLAB
2. **Check Current AWR Snapshot Settings:**
    - Run the following SQL to check the current snapshot interval and retention settings:

```
SELECT snap_interval, retention
FROM dba_hist_wr_control;
```

b. Modify Snapshot Settings

1. **Modify the AWR Snapshot Settings:**
    - Use the following PL/SQL block to change the snapshot interval to 60 minutes and the retention to 30 days:

```
BEGIN
  DBMS_WORKLOAD_REPOSITORY.modify_snapshot_settings(
    interval => 60,     -- Snapshot interval in minutes
    retention => 43200 -- Retention period in minutes (30 days)
  );
END;
```

2. **Verify the New Settings:**

- Run the following SQL to verify the new settings:

```
SELECT snap_interval, retention
FROM dba_hist_wr_control;
```

2. Generate AWR Snapshots

a. Manually Create a Snapshot

1. **Create a Manual Snapshot:**
   - Use the following PL/SQL block to create a manual snapshot:

```
EXEC DBMS_WORKLOAD_REPOSITORY.create_snapshot;
```

3. Generate an AWR Report

a. Capture Snapshot IDs

1. **Retrieve Snapshot IDs:**
   - Run the following SQL query to get the two most recent snapshot IDs:

```
SELECT snap_id, begin_interval_time, end_interval_time
FROM dba_hist_snapshot
ORDER BY snap_id DESC;
```

   - Note down the `snap_id` values for the two most recent snapshots. For example, let's say the two latest snapshot IDs are 52 (most recent) and 51 (second most recent).

b. Generate the AWR Report

1. **Generate the AWR Report:**
   - Use the following PL/SQL block to generate the AWR report dynamically using the snapshot IDs:

```
-- Identify snapshot IDs
SELECT SNAP_ID, BEGIN_INTERVAL_TIME, END_INTERVAL_TIME
FROM DBA_HIST_SNAPSHOT
ORDER BY SNAP_ID;

-- Generate AWR Report
SET LONG 1000000;
SET PAGESIZE 0;
SET LINESIZE 300;
SET TRIMSPOOL ON;

SPOOL awr_report.html;

SELECT OUTPUT
FROM TABLE(
  DBMS_WORKLOAD_REPOSITORY.AWR_REPORT_HTML(
    l_dbid            => (SELECT dbid FROM v$database),
    l_inst_num        => (SELECT instance_number FROM v$instance),
```

```
    l_bid             => 100,   -- Example Begin Snapshot ID
    l_eid             => 110    -- Example End Snapshot ID
  )
);

SPOOL OFF;
```

2. **Execute the PL/SQL Block:**
    - Execute this PL/SQL block by pressing the green run button or by pressing F5.
3. **Access the AWR Report:**
    - Open a web browser and navigate to `http://localhost:5501/public/awr_report.html` to view the generated AWR report.
4. **The above will not work - just copy the output HTML into a file called AWR.html and view that in a browser***

Summary:

By following these steps, you have:

- Configured the AWR snapshot settings.
- Generated manual AWR snapshots.
- Created an AWR report dynamically using SQL Developer.

Additional Information:

- **AWR Overview:** The Automatic Workload Repository (AWR) is a built-in repository in Oracle databases that collects, processes, and maintains performance statistics. It provides a historical view of database performance data, which can be used for diagnosing and resolving performance issues.
- **Key Components:**
    - **Snapshots:** Periodic collections of performance data.
    - **Reports:** Summarize the data collected in snapshots, highlighting performance issues and trends.
- **Snapshot Interval and Retention:**
    - **Snapshot Interval:** The frequency at which snapshots are taken. The default is every 60 minutes.
    - **Retention Period:** How long the snapshots are stored in the repository. The default is 8 days.

This lab provides a comprehensive understanding of configuring, generating, and utilizing AWR reports to monitor and diagnose Oracle database performance.