EXAM OBJECTIVE: CREATE THE SYSAUX TABLESPACE

UNDERSTANDING THE SYSAUX TABLESPACE

In Oracle 10g, we have the introduction of a new SYSAUX tablespace. This tablespace is an auxiliary tablespace to the SYSTEM tablespace.

- This tablespace is a mandatory tablespace that always gets created when the database is created. Some database components that formerly created and used separate tablespaces now occupy the SYSAUX tablespace
- The SYSAUX tablespace is a permanent tablespace which is enabled read-write. It is always a locally managed tablespace with segment space management defined as AUTO.
- The SYSAUX tablespace provides a centralized repository for all auxiliary database metadata that does not reside in the SYSTEM tablespace.

OCCUPANTS OF THE SYSAUX TABLESPACE

The tables displayed below gives you an idea of various features of the database that now use the SYSAUX tablespace, that earlier might have created their own tablespaces.

OCCUPANT	ORIGINAL TABLESPACE
Text, Ultra Search	DRSYS
Intermedia, Spatial	SYSTEM
Scheduler	New in Oracle 10g
OLAP	CWMLITE
XML DN	XDB_RESINFO
Workspace Manager	SYSTEM
Data Mining	ODM
Server Manageability Components	New in Oracle 10g
Recovery Catalog	TOOLS
EM Repository	OEM_REPOSITORY
Analytical Workspace Object table	SYSTEM
LogMiner, Log Standby, Streams	SYSTEM
Statspack	User defined

CREATING THE SYSAUX TABLESPACE

The SYSAUX tablespace may be created using the

- **CREATE DATABASE** command. In this command the clause SYSAUX DATAFILE has been introduced.

- The GUI interface, **Database Configuration Assistant (DBCA).** DBCA has been modified to support the mandatory creation of the SYSAUX tablespace.

- If you are upgrading your database from an earlier version of Oracle to 10g, you may use the **Database Upgrade Assistant (DBUA)**. If using this assistant, the creation of the SYSAUX tablespace has been automated.

Example of CREATE DATABASE statement that creates a SYSAUX tablespace:

```
SQL> CREATE DATABASE
       DATAFILE '/disk1/datafiles/system01.dbf' SIZE 300M
       SYSAUX DATAFILE '/disk1/datafiles/sysaux01.dbf' SIZE 300M
       DEFAULT TEMPORARY TABLESPACE dtemp
       TEMPFILE '/disk2/datafiles/temp01.dbf' SIZE 100M
       UNDO TABLESPACE undotbs
       DATAFILE '/disk2/datafiles/undotbs_01.dbf' SIZE 100M;
```

ALTERING THE SYSAUX TABLESPACE

You can add a datafile to the SYSAUX tablespace by using the ALTER TABLESPACE command. However you need SYSDBA privileges to do so.

You can take the SYSAUX tablespace offline. This is if you wish to make it unavailable. Features that use the tablespace may not function normally.

You cannot rename the SYSAUX tablespace nor can you drop it. Trying to perform either action will generate an error.

Transportable tablespaces for SYSAUX is not supported.

EXAM OBJECTIVE: RELOCATE SYSAUX OCCUPANTS

After the creation of the SYSAUX tablespace, there is a possibility that one or more components use up a lot of its space. You should monitor the SYSAUX tablespace for space usage. There may a need to move the occupant to its own or another tablespace if it occupies too much space.

- The occupants that cannot be relocated are STREAMS, SMC, STATSPACK, ORDIM, ORDIM/PLUGINS, ORDIM/SQLMM and JOB_SCHEDULER.

- If you have the SYSDBA privileges, and the database is online you can relocate occupants of the SYSAUX tablespace.

If you are using SQL commands to do the relocation, you may first need to find out which procedure to use to move a particular occupant. You can do so by issuing a querying the MOVE_PROCEDURE column of the V$SYSAUX_OCCUPANTS view.

```
SQL> SELECT OCCUPANT_NAME, SCHEMA_NAME,
       MOVE_PROCEDURE
       FROM V$SYSAUX_OCCUPANTS;
```

To display the current usage of the occupant, you can once again issue a query against V$SYSAUX_OCCUPANTS such as:

```
SQL> SELECT OCCUPANT_NAME, SPACE_USAGE_KBYTES
       FROM V$SYSAUX_OCCUPANTS;
```

Assume that you install Oracle Ultra Search into the default tablespace, which is SYSAUX. Later you discover that Ultra Search is using up too much space. To alleviate this space pressure on SYSAUX, you can call a PL/SQL move procedure specified in the V$SYSAUX_OCCUPANTS view to relocate Ultra Search to another tablespace. You would issue a statement like:

```
SQL> EXEC WKSYS.MOVE_WK('DRSYS');
```

The move procedure also lets you move a component from another tablespace into the SYSAUX tablespace.

```
SQL> EXEC WKSYS.MOVE_WK('SYSAUX');
```

EXAM OBJECTIVE: RENAMING TABLESPACES

Using the RENAME TO clause of the ALTER TABLESPACE, you can rename a permanent or temporary tablespace

In the example given below, the *users* tablespace is renamed to newusers;

```
SQL> ALTER TABLESPACE users RENAME TO newusers;
```

GUIDELINES

The following affect the operation of this statement:

- The COMPATIBLE initialization parameter must be set to 10.0 or higher.
- The SYSTEM tablespace or the SYSAUX tablespace cannot be renamed and an error is raised.

- An offline tablespace or a tablespace that has a datafile offline cannot be renamed and an error is raised.
- If the tablespace is read only, then datafile headers are not updated. A message is written to the alert log indicating that datafile headers have not been renamed. The data dictionary and control file are updated.
- If the tablespace is the default temporary tablespace, then the corresponding entry in the database properties table is updated and the DATABASE_PROPERTIES view shows the new name.

EXAM OBJECTIVE: CREATE A DEFAULT PERMANENT TABLESPACE

In Oracle 10g we have the new feature known as the Default Permanent tablespace. Once you have defined the Default Permanent tablespace, if a user is created without explicitly being assigned a default tablespace, the user will be assigned this "default permanent tablespace".

The concept of the default permanent tablespace does not apply to the SYSTEM, SYS or OUTLN user.

DESIGNATING A DEFAULT PERMANENT TABLESPACE

This can be done using the EM console or by issuing SQL commands.

You can designate any existing permanent tablespace to be the default permanent tablespace of your database.

Select Database Control Home Page -> Administration Tab -> Storage section -> Tablespaces Link -> Select the tablespace -> Edit Tablespaces page -> Type section -> Set as default permanent tablespace -> Apply Button.

Note: If you are using DBCA, the USERS tablespace is set as the default permanent tablespace.

If you are using SQL commands to designate a default permanent tablespace, then you can do so in the CREATE DATABASE or ALTER DATABASE commands using the DEFAULT TABLESPACE clause. Examples are displayed below:

```
SQL> CREATE DATABASE
        DATAFILE '/disk1/datafiles/system01.dbf' SIZE 300M
        SYSAUX DATAFILE '/disk1/datafiles/sysaux01.dbf' SIZE 300M
        DEFAULT TABLESPACE users
        DATAFILE '/disk3/datafiles/users01.dbf'
        SIZE 100M
        SEGMENT SPACE MANAGEMENT AUTO
        DEFAULT TEMPORARY TABLESPACE dtemp
```

```
    TEMPFILE '/disk2/datafiles/temp01.dbf' SIZE 100M
    UNDO TABLESPACE undotbs
    DATAFILE '/disk2/datafiles/undotbs_01.dbf' SIZE 100M;

SQL> ALTER DATABASE DEFAULT TABLESPACE newusers;
```

EXAM OBJECTIVE: COPY FILES USING THE DATABASE SERVER

In Oracle 10g you need not perform an operating copy of a file when transferring files between databases as you would do when transporting tablespaces.
You can now use the **DBMS_FILE_TRANSFER package** or use Streams propagation.

GUIDELINES

Files to be created by using the DBMS_FILE_TRANSFER package must always be readable/writable by all processes in the database.

You can use the COPY_FILE procedure of the DBMS_FILE_TRANSFER package if you wish to perform a copy of a file on the local system.

STEPS TO COPY A FILE ON THE LOCAL FILES SYSTEM

The following example copies a binary file named file1.dat from the /disk1/source directory to the /disk2/destination directory as file1_copy.dat on a local file system:

1. In SQL*Plus, connect as an administrative user who can grant privileges and create directory objects using SQL.

2. Use the SQL command CREATE DIRECTORY to create a directory object for the directory from which you want to copy the file. A directory object is similar to an alias for the directory. For example, to create a directory object called SOURCE_DIR for the /disk1 /source directory on your computer system, execute the following statement:

   ```
   CREATE DIRECTORY SOURCE_DIR AS '/disk1 /source';
   ```

3. Use the SQL command CREATE DIRECTORY to create a directory object for the directory into which you want to copy the binary file. For example, to create a directory object called DEST_DIR for the /disk2/destination directory on your computer system, execute the following statement:

   ```
   CREATE DIRECTORY DEST_DIR AS '/disk2 /destination';
   ```

4. Grant the required privileges to the user who will run the COPY_FILE procedure. In this example, the USERA user runs the procedure.

```
GRANT EXECUTE ON DBMS_FILE_TRANSFER TO USERA;

GRANT READ ON DIRECTORY source_dir TO USERA;

GRANT WRITE ON DIRECTORY dest_dir TO USERA;
```

5. Connect as USERA user:

```
CONNECT  usera/<password>
```

6. Run the COPY_FILE procedure to copy the file:

```
BEGIN
        DBMS_FILE_TRANSFER.COPY_FILE(
                source_directory_object      => 'SOURCE_DIR',
                source_file_name             => 'file1.dat',
                destination_directory_object => 'DEST_DIR',
                destination_file_name        => 'file1_copy.dat');
END;
/
```

EXAM OBJECTIVE: USE THE REDO LOGFILE SIZE ADVISOR

Oracle 10g has introduced a new feature called the Redo Logfile Size Advisor. The Redo Log File Advisor determines the **optimal smallest online redo log file size** based on the current FAST_START_MTTR_TARGET setting and MTTR statistics. An online redo log file size is considered as optimal when it does not drive incremental checkpointing more aggressively than needed by FAST_START_MTTR_TARGET.

GUIDELINES

- The FAST_START_MTTR_TARGET parameter must be set for the Redo Log File Advisor.
- A new column in **V$INSTANCE_RECOVERY** shows the redo log file size in megabytes that is considered as optimal based on the current FAST_START_MTTR_TARGET setting.
- The Redo Log File Advisor can be invoked from the EM console, by selecting **Database -> Administration tab -> Storage section -> Redo Log Groups –> Click the option button for the group you to want to retrieve sizing information for -> Select sizing advice from the Actions drop-down list -> Go**