Database Administration and Management – BITF21 (Morning)

Solution Key **Quiz 4** **DBAF(II) – 3, 5, 8, 10, 11**

1. Define the Listener process. Explain 3 Connection Methods to connect a Listener. (10)

The listener is a process running on a node that listens for incoming connections on behalf of a database or a number of databases.

Spawn and Bequeath

The listener passes or bequeaths the connection to a spawned process. This method is used in a dedicated server configuration only.

The listener may spawn dedicated server processes as connection requests are received and bequeath (or pass) the connections to the server processes. The use of this method is dependent on the ability of the underlying operating system to support inheritance of network endpoints. When the listener forks a dedicated server process and bequeaths the connection to the server process, it is called a bequeath session.

Direct Hand-Off

The listener will hand off a connection to a dispatcher when an Oracle Shared Server is used. This method is not possible with dedicated server processes.

When the operating system handles a shared server connection in the fashion described above, it is said to be a direct hand-off connection. The only difference between the two is that the listener does not spawn the dispatcher processes. The connection mechanics however, are identical

Redirected (Message)

A connection may be redirected by the listener to a dispatcher if a Shared Server is used.

When conditions do not support the establishment of a bequeath or direct hand-off connection, a redirect session will be established.

2. Explain two ways of Service Registration and Configuration in a listener process. (10)

The listener can be configured in two ways:

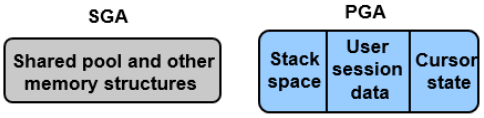
- Dynamic service registration
  - Does not require configuration in listener.ora file
  - The listener relies on the PMON process
- Static service configuration
  - Used for Oracle8 and earlier releases
  - Requires listener.ora configuration
  - Required for Oracle Enterprise Manager and other services

3. (10)

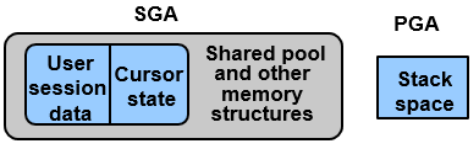
a. **What are the benefits of Oracle Shared Server? How does the storage of user data differ in Dedicated Server and Shared Server? Explain with diagram.**

- Reduces the number of processes against an instance
- Increases the number of possible users
- Achieves load balancing
- Reduces the number of idle server processes
- Reduces memory usage and system overhead

Dedicated Server: User session data is kept in the PGA



Oracle Shared Server: User session data is held in the SGA



b. **Write three Recovery Cases that may arise in Read-Only Tablespaces. How do you perform recovery in each case?**

Case 1: The tablespace being recovered is read-only, and was read-only when the last backup occurred. In this case, you can simply restore the tablespace from the backup. There is no need to apply any redo information.

Case 2: The tablespace being recovered is read-write, but was read-only when the last backup occurred. In this case, you need to restore the tablespace from the backup and apply the redo information from the point when the tablespace was made read-write.

Case 3: The tablespace being recovered is read-only, but was read-write when the last backup occurred. Because you should always back up a tablespace after making it read-only, you should not experience this situation. However, if this does occur, you must restore the tablespace from the backup and recovery up to the time that the tablespace was made read-only.

4. Describe the differences between ARCHIVELOG and NOARCHIVELOG modes. Write Pros and Cons of each. **(10)**

NOARCHIVELOG Mode

By default, a database is created in NOARCHIVELOG mode. The characteristics of operating a database in NOARCHIVELOG mode are as follows:

- Redo log files are used in a circular fashion.
- A redo log file can be reused immediately after a checkpoint has taken place.
- After redo logs are overwritten, media recovery is only possible to the last full backup.

ARCHIVELOG Mode

The characteristics of operating a database in ARCHIVELOG mode are as follows:

- A filled redo log file cannot be reused until a checkpoint has taken place and the redo log file has been backed up by the ARCn background process.
- An entry in the control file records the log sequence number of the archived log file.
- The most recent changes to the database are available at any time for instance recovery, and the archived redo log files can be used for media recovery.

Recovery in ARCHIVELOG Mode: Advantages and Disadvantages

Advantages

- Only need to restore lost or damaged files.
- No committed data is lost. Restoring the files, then applying archived and redo logs, brings the database to the current point in time.
- The total recovery time is the length of time required to restore the files and apply all archived and redo logs.
- Recovery can be performed while the database is open (except system tablespace files and datafiles that contain online undo segments).

Disadvantages

- You must have all archived redo log files from the time of your last backup to the current time.
- If you are missing one, you cannot perform a complete recovery, because all archived redo log files must be applied in sequence; that is, archived log 144, then 145, then 146, and so on.

Recovery in NOARCHIVELOG Mode: Advantages and Disadvantages

Advantages

- Easy to perform, because only a restore of all files from a backup is required.
- The time taken for recovery is merely the length of time it takes you to restore all files, given your hardware and operating system.

Disadvantages

- All data entered by users since the last backup will be lost and must be reapplied manually.
- The entire database must be restored from the last whole closed backup, even if only one datafile is lost.

5. Differentiate between Open and Closed Backups. Write Pros and Cons and ways to perform each backup. (10)

A consistent whole database backup, also known as a closed database backup, is a backup that is taken of all the datafiles and control files that constitute an Oracle database while the database is closed. It can also include the online redo log files, parameter file, and the password file.

Advantages of Making Consistent Whole Database Backups

- A consistent whole database backup is conceptually simple
- A minimal number of commands is required to perform a closed database backup.
- You can automate the closed database backup process
- All files copied during a closed database backup are consistent to a point in time.

Disadvantages of Making Consistent Whole Database Backups

- For business operations where the database must be continuously available, a consistent whole database backup is unacceptable because the database is shutdown and unavailable during the backup.
- The amount of time that the database is unavailable is affected by the size of the database, the number of datafiles, and the speed with which the copy operations on the datafiles can be performed. If this amount of time exceeds the allowable down time, you must choose another type of backup.
- The recovery point is only to the last full consistent whole database backup, and lost transactions may have to be entered manually following a recovery operation.

Open Database Backup

If business requirements do not permit you to shut down the database to perform backups, then you can use the following methods to perform backups of the database while it is in use:

- Perform backups of all the tablespaces or individual datafiles while they are online or offline.
- Back up the control file to a binary file or create a script to re-create the control file.

The online redo log files do not need to be backed up.

Advantages of Making an Open Database Backup

- The database is available for normal use during the backup.
- A backup can be done at a tablespace (with RMAN) or datafile level.
- Supports businesses that operate all day every day.

Disadvantages of an open database backup:

- Data inconsistency due to uncommitted transactions or ongoing modifications.
- Longer backup times due to increased I/O load.
- Risk of media failure leading to data loss.
- Complexity due to manual intervention and specialized knowledge required.