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ORACLE DATABASE

Q1. DISCRIBE ORACLE MEMORY STRUCTURE AND BACKGROUND PROCESSES.

Oracle relies on memory to store various types of information:

- Program Code: Code being executed within the database.
- Session Information: Details about connected sessions, even if not actively in use.
- Shared Information: Data shared among Oracle processes.

The primary memory structures in Oracle are:

System Global Area (SGA): Shared memory structures containing data and control information for an Oracle database instance. It includes:

- Database buffer cache
- Shared pool
- Redo log buffer
- Data dictionary cache
- Miscellaneous information
- Optional components like the large pool and Java pool.

Program Global Area (PGA): Memory region containing data and control information for a single process (server or background). Also known as a "process global area," it's a non-shared memory area where a process can write data.

Background Processes:

- Database Writer (DBWR): Writes modified blocks from the database buffer cache to the data files.
- Log Writer (LGWR): Writes redo log entries to disk.
- Checkpoint (CKPT): Signals the database writer at a checkpoint and updates all data files and control files to indicate the most recent checkpoint.
- System Monitor (SMON): Performs instance recovery when a failed instance is restarted.
- Process Monitor (PMON): Performs recovery in case of user failures.
- Archiver (ARCn): Copies online redo log files.
- Recoverer (RECO): Recovers pending transactions.

Q2. DESCRIBE ORACLE LOGICAL AND PHYSICAL STORAGE STRUCTURES

LOGICAL STORAGE STRUCTURE

Logical Storage Structures:

Tablespace: A storage location where the actual data underlying database objects is stored.

There are different types:

- Permanent: Stores user and application data.
- Undo: Stores undo data for transaction rollback, read consistency, and database recovery.
- Temporary: Used for storing temporary data.

Physical Storage Structures:

- Control Files: Contains data about the Oracle database itself.
- Data Files: Stores the actual data. Each data file is associated with one database and tablespace.
- Redo Log Files: Crucial for minimizing data loss in the event of a system restart or shutdown. They store redo log entries.