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***1.DESCRIBE ORACLE DATABASE MEMORY STRUCTURE AND BACKGROUND PROCESSES***

***Oracle Database includes several memory areas, each of which contains multiple subcomponents.***

***The basic memory structures associated with Oracle Database include:***

***System global area (SGA)***

***The SGA is a group of shared memory structures, known as SGA components, that contain data and control information for one Oracle Database instance. All server and background processes share the SGA. Examples of data stored in the SGA include cached data blocks and shared SQL areas.***

* ***Database Buffers: Cache recently accessed data blocks from disk files.***
* ***Redo Buffers: Hold redo log entries, which track changes made to the database.***
* ***Shared Pool: Stores frequently used SQL statements, library cache, and other shared data structures.***
* ***Large Pool: Allocates memory for large objects like LOBs and CLOBs.***
* ***Java Pool: Used for Java Virtual Machine (JVM) applications running in the database.***
* ***Stream Pool: Used for streaming operations like bulk inserts and exports.***
* ***Dictionary Cache: Caches database object metadata like tables, columns, and triggers.***
* ***Latch Cache: Manages latches, concurrency control mechanisms for accessing shared resources.***
* ***Undo Cache: Stores undo records for rollback operations.***

***Program global area (PGA)***

***A PGA is a nonshared memory region that contains data and control information exclusively for use by an Oracle process. Oracle Database creates the PGA when an Oracle process starts.***

***One PGA exists for each server process and background process. The collection of individual PGAs is the total instance PGA, or instance PGA. Database initialization parameters set the size of the instance PGA, not individual PGAs.***

***User global area (UGA)***

***The UGA is memory associated with a user session.***

***Software code areas***

***Software code areas are portions of memory used to store code that is being run or can be run. Oracle Database code is stored in a software area that is typically at a different location from user programs—a more exclusive or protected location.***

***Background Processes:***

***These are server processes that run independently of user sessions and perform various tasks in the background. Some common background processes include:***

***DBWn (Database Writer Process): Writes dirty buffers from the SGA to data files on disk.***

* ***LGWR (Log Writer Process): Writes redo log entries from redo buffers to the redo log files.***
* ***SMON (System Monitor): Monitors various aspects of the instance and performs recovery actions if necessary.***
* ***ARCH (Archival Process): Moves redo log files from online redo logs to archive redo logs.***
* ***CKGW (Checkpoint Process): Writes dirty buffers from the SGA to data files at predetermined intervals.***
* ***RMAN (Recovery Manager): Performs backup and recovery operations.***
* ***Job Queue Processes: Execute scheduled jobs and manage internal background jobs.***

***2.Describe oracle logical and physical storage structure***

***Logical storage structure :***

***Oracle Database allocates logical space for all data in the database.***

***The logical units of database space allocation are data blocks, extents, segments, and tablespaces.***

1. ***Data Blocks: The fundamental unit of logical storage, typically sized 4-8KB. Blocks hold rows of data from one or multiple tables.***
2. ***Extents: A contiguous set of data blocks allocated for a specific segment (e.g., table, index).***
3. ***Segments: Group related extents (e.g., all data blocks for a table, all index blocks for an index).***
4. ***Tablespaces: Logical containers that group segments. They organize database objects and simplify administration.***

***Physical storage structure:***

***At a physical level, the data is stored in data files on disk. The data in the data files is stored in operating system blocks.***

1. ***Data Files: Physical files on disk where data blocks are written. Multiple tablespaces can share data files.***
2. ***Redo Log Files: Capture changes made to the database (inserts, updates, deletes) for crash recovery.***
3. ***Control Files: Contain startup information for the database, like data file locations and tablespace layouts.***