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Option: information technology

ORACLE DATABASE ADMINISTRATION

Q1. Describe oracle memory structure and background processes

Oracle Database includes 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.

- Program global area (PGA)

A PGA is a no shared 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

Background processes are separate programs that run continuously within an Oracle database instance. They handle various maintenance tasks, freeing up server processes for user transactions. Imagine them as the dedicated housekeeping team, keeping the database clean and functional while user queries take center stage.

This section describes various topics related to the background processes that perform many important functions throughout your product such as:

- Processing To Do Entries
- Monitor processes that select records in a given state to progress them to their next state in their lifecycle
- Processes that purge data
- Processes that extract data
- And many more...

Q2.Describe oracle logical and physical storage structure

One characteristic of an RDBMS is the independence of logical data structures such as tables, views, and indexes from physical storage structures.

Because physical and logical structures are separate, you can manage physical storage of data without affecting access to logical structures. For example, renaming a database file does not rename the tables stored in it.

An Oracle database is a set of files that store Oracle data in persistent storage. This section discusses the database files generated when you issue a `CREATE DATABASE` statement:

Oracle's storage structure comprises two layers: logical and physical. Understanding these layers is crucial for managing and optimizing your database.

Logical Storage Structure:

The logical layer defines how users and applications see and interact with data. It consists of several building blocks:

- Table spaces: Logical containers that group related data files and control storage management aspects like access controls and allocation limits.
- Segments: Logical units representing specific types of data, like tables, indexes, or LOBs (large objects).
- Extents: Contiguous chunks of data blocks within a segment.
- Data Blocks: The smallest addressable unit of data storage, typically 4KB or 8KB in size. They hold actual data like rows, indexes, or metadata.

This layered approach offers several advantages:

- Data independence: Logical structures are independent of physical location, allowing easy reorganization and relocation without affecting user access.
- Flexibility: You can define table spaces with different storage characteristics to optimize performance for specific types of data.
- Scalability: Adding more disk space simply expands existing table spaces or creates new ones.

Physical Storage Structure:

The physical layer deals with the underlying hardware where data resides. It involves:

- Data Files: Operating system files on disk that store actual data blocks.
- Redo Logs: Files that record all database modifications for recovery purposes.
- Control Files: Contain the database's physical structure and location information.

Understanding the physical layout helps with tasks like:

- Performance tuning: Identifying storage bottlenecks and optimizing data placement.

- Disaster Recovery: Restoring data from backups or archives stored on separate physical devices.
- Storage Management: Efficiently allocating and utilizing disk space across different table spaces.