

# Database Management Systems

## Database Tuning

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  - Input-output tuning
  - Memory and resource management tuning
  - Database Maintenance and disk performance monitoring

# Database tuning

Database tuning is a conceptually different idea than query optimization/tuning

Database tuning is a combined approach to improve the performance of a database by:

- Optimization
- Homogenization

The approaches to database tuning are:

- 1 Input-output tuning
- 2 Memory and resource management tuning
- 3 Database maintenance and disk performance monitoring

# Input-output tuning

It concerns balancing the input/output evenly across all available disks to reduce disk access times. For smaller databases and those not using RAID, it is ensured that different data files and tablespaces are distributed across the available disks.

This can be done in the following ways:

- Using automatic storage management
- Choosing the appropriate file system type (e.g., S5 for Solaris, ext3 for Linux, etc.)

**Note:** Placing transaction logs and temporary spaces appropriately are crucial because they consume heavy input/output load.

# Memory and resource management tuning

Memory tuning is started by measuring the paging and swapping space to determine how much memory is available. This is followed by tuning the database buffer cache ensuring that the most frequently accessed data is cached longer.

Memory management can be tuned in the following ways:

- Allocating sufficient swap space
- Controlling paging
- Adjusting the database block size
- Allocating memory resource

Processing resources are sometimes assigned to specific activities to improve concurrency.

# Database maintenance and disk performance monitoring

Database maintenance includes backups, column statistics updates, and defragmentation of data inside the database files.

The disk performance should also be monitored in regular intervals and during heavy loads.