

Parallel DBMS vs Distributed DBMS

Why Parallel or Distributed DBMS?

Parallel and distributed DBMS architectures are designed to overcome the limitations of traditional DBMS when dealing with massive amounts of data.

- Handle Large Data Efficiently.
- Improve Speed, Reliability, and Availability.

What is Parallel DBMS?

A **parallel database system** is a type of database architecture where a **single database** is accessed and managed by **multiple processors working together**. The main **goal** of this system is to **speed up query processing** by dividing tasks among several processors that can operate in parallel.

What is Distributed DBMS?

A **distributed database system** is a type of database architecture where the **database is spread across multiple physical locations**. Each site in the system is responsible for **managing its own portion of the data**, but all the sites work together as a unified database system. Goal is data availability and local access

Key Differences

Aspect	Parallel DBMS	Distributed DBMS
System Coupling	Tightly coupled — processors work within a single system.	Loosely coupled — sites connected over a network.
Location of Data	All data at a single location, processed in parallel.	Data spread across multiple, often distant, sites.
Speed	Very high due to simultaneous execution.	Comparatively slower due to network delays.
Data Handling	Data partitioned across disks for fast access.	Each site manages its local database independently.
Architecture	Shared Memory / Disk / Nothing.	Shared Nothing (each site works autonomously).

Key Differences

Aspect	Parallel DBMS	Distributed DBMS
Query & Transaction Processing	Parallel execution in a single system.	More complex — requires site coordination.
Types of Transactions	Supports local transactions only.	Handles both local and global transactions.
Query Optimization	Complex due to processor synchronization.	Easier, varies by site.

*Thank
you!*

