

# Monitoring Usage and Performance part2

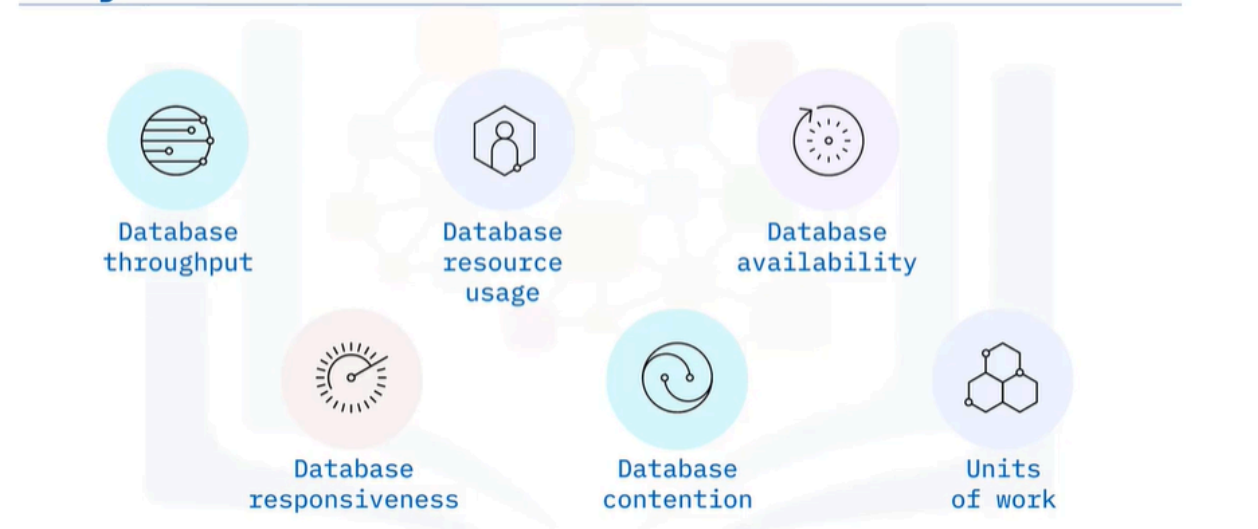
Sure! Let's dive into the concept of **Database Throughput** in simple terms.

## Database Throughput: A Simple Explanation

Throughput in a database context refers to how much work the database can handle over a certain period. Imagine a busy restaurant where the number of customers served in an hour represents the restaurant's throughput. In the same way, database throughput is measured by the number of queries (requests for information) that the database can process each second. The higher the throughput, the more efficient the database is at handling requests.

For example, if a database can process 100 queries per second, it means it's like a restaurant serving 100 customers every minute. If the restaurant can serve more customers without compromising service quality, it's doing a great job! Similarly, a database with high throughput can manage more requests efficiently, leading to better performance and user satisfaction.

## Key database metrics



- Some of the key metrics for monitoring the usage and performance of your database include the following: Database throughput is one of the most significant metrics of database performance.
  - It indicates how much total work is being taken on by your database and is typically measured by the number of queries executed per second. Database resource usage monitors the database resource usage by measuring the CPU, memory, log space, and storage usage.
  - This summary metric represents the database resource usage by two aspects: average/max/latest number and time series number.
  - Database availability signals whether the database is up or down, that is, available or unavailable.
  - It is typically a summary metric that represents the historical data on available time as a percentage. Database responsiveness shows how well the system is responding to inbound requests and is another of the more commonly used database performance metrics.
  - It provides DBAs with information on the average response time per query for their database servers, indicating how quickly they respond with query results. Database contention indicates whether there is any contention between connections, by measuring lock-waits and concurrent database connections.
  - Database contention is the term used to describe what happens when multiple processes are competing to access the same database resource at the same time. and units of work tracks what transactions (units of work) are consuming the most resources on the database server.

# Key database metrics



- Here are some more key metrics: Connections can display all kinds of network connection information to a database management console and can indicate whether a database server might fail due to long-running queries or having too many open connections.
  - Database connections are network connections that enable communication between clients and database software. Open connections are used for sending commands and receiving responses in the form of result sets.
  - Most frequent queries tracks the most frequent queries received by your database servers, including their frequency and average latency, that is, how long they take to be processed.
  - It can help DBAs optimize these queries to gain substantial performance improvements. Locked objects shows detailed information about any locked processes and the process that blocked them.
  - Locks and blocks stop several concurrent transactions from accessing an object at the same time.
  - They put contending processes on hold until that object has been released and is accessible again. Stored procedures displays the aggregated execution metrics for procedures, external procedures, compiled

functions, external functions, compiled triggers, and anonymous blocks invoked since database activation. Buffer pools tracks the usage of buffer pools and table spaces.

- A directory server uses buffer pools to store cached data and to improve database performance. When the buffer pool fills up, it removes older and less-used data to make room for newer data.
- And top consumers shows the top consumers of a system's resources and can help DBAs with capacity planning and resource placement. Please note, this is just a small selection of the numerous metrics available in most database management systems.

## Monitoring tools

---

### Db2

- Db2 Data Management Console
- Workload manager
- Snapshot monitors

### PostgreSQL

- pgAdmin dashboard (downloadable open-source tool)

### MySQL

- MySQL Workbench: Performance Dashboard
- MySQL Workbench: Performance Reports
- MySQL Workbench: Query Statistics
- MySQL Query Profiler

- To review these key database performance metrics, you will use different out-of-the-box tools, depending on your database. For example, in Db2 you can use tools such as the Db2 Data Management Console, the workload manager, and snapshot monitors. In PostgreSQL, you can use the pgAdmin dashboard, which is a very popular open-source query-monitoring tool for PostgreSQL systems. In MySQL, you can utilize the Performance Dashboard, Performance

Reports, and Query Statistics tools in the MySQL Workbench, and you can use the MySQL Query Profiler to identify slow running queries.

## Third-party monitoring tools

---

- pganalyze (PostgreSQL)
- PRTG Network Monitor (PostgreSQL, MySQL, SQL Server, Oracle)
- Available for multiple database systems:
  - SolarWinds Database Performance Analyzer
  - Quest Foglight for Databases
  - Datadog (database, system, and application monitoring)

- There are several third-party performance and query monitoring tools available to help you to monitor queries, optimize performance, and speed up your database. Some of them may also provide performance tuning and query optimization capabilities as well.
- For PostgreSQL systems, there is the pganalyze tool which provides automatic insights into query plans, query analysis, database visualization and dashboards, log insights, and performance optimization and monitoring. And if you have a PostgreSQL, MySQL, SQL Server or Oracle database and need a query-monitoring tool, you could try PRTG Network Monitor. Many of the third-party tools are available for multiple database systems, such as SQL Server, Oracle, Sybase, Db2, MySQL, and PostgreSQL to name but a few. SolarWinds offers a subscription-based monitoring solution called Database Performance Analyzer. Foglight for Databases from Quest enables you to proactively monitor your complete database environment and view the state of all database platforms in a single comprehensive interface. And Datadog is a SaaS platform that includes multiple system monitoring tools. It has more than 450 built-in integrations to connect to multiple different database systems.

## Summary

---

In this video, you learned that:

- There are many different metrics you can use to monitor the usage and performance of your databases
- There are several different tools available to monitor your databases and queries