

Overview Database monitoring

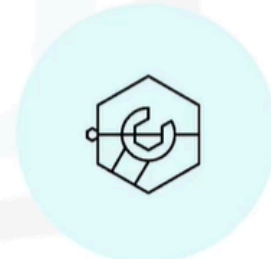
What is database monitoring?

- Critical part of database management
- Scrutinization of day-to-day operational database status
- Crucial to maintain RDBMS health and performance

- one of the most challenging and necessary elements of database management is performance tuning, and one of the critical parts of this process is database monitoring. The term database monitoring refers to the different tasks related to the scrutinization of the day-to-day operational status of your database. Database monitoring is crucial to maintain the health and performance of your relational database management system, regardless of which vendor's database product you are using.

Why monitor your databases?

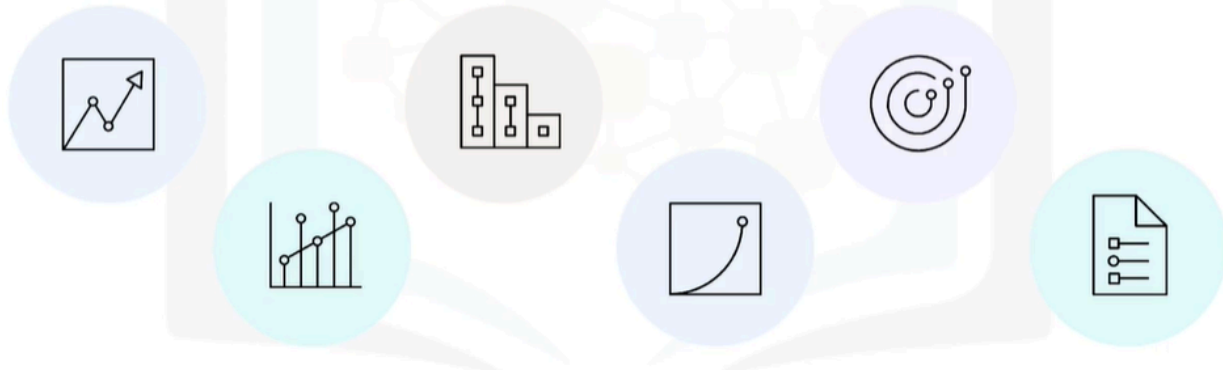
- Regular database monitoring helps identify issues in a timely manner
- If you do not monitor, database problems might go undetected
- RDBMSs offer tools to observe database state and track performance



- When you perform regular database monitoring it helps to identify issues in a timely manner so that you can maintain the health and accessibility of your database system. If you do not perform this monitoring function, then problems and outages in your database might go undetected until it is too late. This can cause your users and customers to lose confidence in your service and potentially your organization could lose customers and income because of it. Most relational database management systems offer tools that enable you to observe the current state of your databases and to track their performance as circumstances vary over time.

Database monitoring tasks

Database admins use this information to perform several database monitoring tasks



- As a database admin, you can then utilize this useful information to perform several database monitoring tasks, including: Forecasting your future hardware requirements based on database usage patterns. Analyzing the performance of individual applications or database queries. Tracking the usage of indexes and tables. Determining the root cause of any system performance degradation. Optimizing database elements to provide the best possible performance. And assessing the impact of any optimization activities.

Reactive monitoring

- After issue occurs – in direct response to the issue
- Typical scenarios include security breaches and critical performance levels



- Before we can talk about the importance of 'proactive' monitoring, we need to differentiate it from 'reactive' monitoring. Reactive monitoring is done after an issue occurs, when you act in direct response to that issue; perhaps by fixing a configuration setting or adding more resources, for example. The most common situations when reactive monitoring occurs is either when your database security has been breached, or the performance of your database reaches critically low levels, or when some other kind of major database incident occurs that greatly impacts your business and therefore needs resolving as soon as possible.

Proactive monitoring

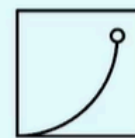
- Prevents reactive panic by identifying issues before they grow larger
- Observes specific database metrics and sends alerts if values reach abnormal levels
- Uses automated processes
- Best strategy and preferred by most database admins



- In contrast, a proactive monitoring strategy seeks to prevent this reactive panic by identifying issues before they grow into large problems. This is primarily achieved by observing specific metrics from your database and then sending alerts to interested parties if the values of these metrics reach abnormal levels. Proactive monitoring typically utilizes automated processes to perform tasks such as regularly verifying that a database system is online and accessible, verifying that configuration changes do not adversely affect the performance of the database system, and that the database system is operating and performing at acceptable levels. This proactive approach is widely considered to be the better strategy and is preferred by most database admins.

Establish a performance baseline

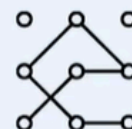
- Determines whether your database system is performing at its most optimal
- Record key performance metrics at regular intervals over a given time period



- To determine whether your database system is performing at its most optimal, you first need to establish a baseline for your database system's performance. To do this, you need to record key performance metrics at regular intervals over a given time period.

Establish a performance baseline


- Compare baseline statistics with database performance at any given time
- If measurements are significantly above or below baseline = analyze and investigate further



- Once you have established a database system performance baseline, you can then compare these baseline statistics with the performance of your database system at any given time. If your comparison indicates that the current performance measurements are either significantly above or below the performance baseline, then these can become potential targets for further analysis and investigation. From those investigations, you might then determine that some database elements need reconfiguring or optimizing.

Establish a performance baseline

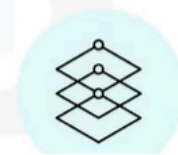
Use your performance baseline to determine operational norms:

- Peak and off-peak hours of operation
 - Typical response times for running queries and processing batch commands
 - Time taken to perform database backup and restore operations
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- Even when things are working well, and as expected, you can still use your performance baseline data to help you determine operational norms, such as your peak and off-peak hours of operation, typical response times for running queries and processing batch commands, and the time taken to perform database backup and restore operations.

Baseline data

The following areas typically have the greatest effect on the performance of your database system:

- System hardware resources
- Network architecture
- Operating system
- Database applications
- Client applications

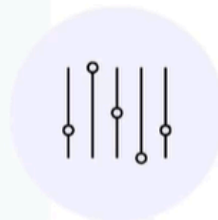


- The following areas typically have the greatest effect on the performance of your database system: System hardware resources, network architecture, operating system, database applications, and client applications.

Database monitoring options

Point-in-time (manual)

- Monitoring table functions
- Examine monitor elements and metrics
- Lightweight, high-speed monitoring infrastructure



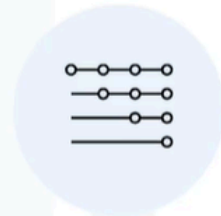
- There are two ways to monitor operations in your database. You can view information that shows the state of various elements of your database in real time using monitoring table functions. For example, you can use a monitoring

table function to examine the total amount of space used in a table. These table functions let you examine monitor elements and metrics that report on virtually all aspects of database operations. The monitoring table functions use a lightweight, high-speed monitoring infrastructure.

Database monitoring options

Historical (automated)

- Event monitors
- Capture info on database operations
- Generate output in different formats



- Alternatively, you can set up event monitors to capture historical information as specific types of database events occur over a given time period. Event monitors capture information about database operations over time, as specific types of events occur. For example, you can create an event monitor to capture information about locks and deadlocks as they occur in the system. Or you might create an event monitor to record when a threshold that you specify (for example, the total processor time used by an application or workload) is exceeded. Event monitors generate output in different formats and can write this output to regular tables. Some event monitors have additional output options.

Summary

In this video, you learned that:

- Database monitoring is crucial to maintain health and performance of your RDBMS
 - Proactive monitoring prevents reactive panic by identifying issues before they become a problem
 - You should establish a baseline to determine whether your RDBMS is performing optimally
 - To monitor database operations, view database state at a point in time, or set up event monitors to capture historical information
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