# HOW TO OPTIMIZE DATABASE PERFORMANCE

Everything You Need to Know

Databases are at the core of every business application and are responsible for collecting, storing, and retrieving large amounts of data. This centralized collection of data is vital to an organization's operations, as it communicates essential information and facilitates critical business processes.

Because of this, locating database issues and resolving them in a timely manner to improve database performance will ensure your databases are functioning at peak efficiency and business disruptions are minimized.

In this article, we will take a closer look at how to improve the performance of your database to ensure an issue-free experience while maintaining productivity across your organization.

When overall database performance is deficient, whether it be from poor data structure or an indexing issue, productivity and profitability could be impacted across the entire organization.

When you learn how to improve database performance, your company will become better positioned for success.

## ANALYZE YOUR SERVER

As database servers are the host of all your processes and the driving force behind application performance, it is imperative that they have sufficient hardware and resources at all times.

If you are experiencing a longer than normal response time or other performance issues, it may be time to check your CPU, memory, and server disk space.

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## CPU

It is important to keep an eye on your CPU ready times, which tells you how many times your system attempted to use the CPU, but couldn't because there weren't enough resources available.

This will help you better understand your CPU utilization and determine if you need to upgrade to a larger CPU. After all, the more powerful your CPU is, the better it will be able to handle multiple applications and requests, thereby improving database performance.

## MEMORY

If your servers are lacking memory, failure of your database is imminent. One way to identify if you need more memory is to check the number of page faults your system has.

If the number of faults is high, it means your servers are running low (or completely out of) available memory. Allocating more memory to your servers will certainly help optimize database performance.

## DISK SPACE

When you are setting up a new database server, it is best practice to store your data, log, and backup files onto separate disks. Not only will this minimize disk fragmentation while improving performance, but it will also be extremely handy in the event of disaster recovery.

The types of disks in your server are also important to consider. Millions of I/O operations may be used to access or return the necessary data for a single query.

Choosing solid-state disks (SSDs) can provide the power your SQL server, Oracle database, or other relational database management system needs for optimal performance.
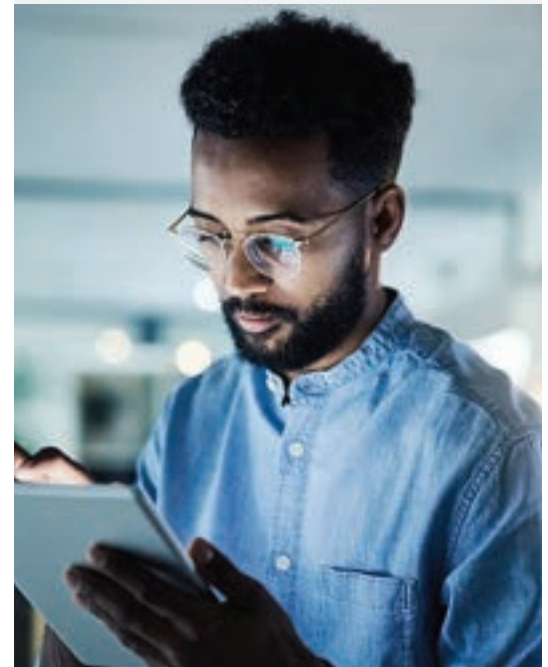
*"...defining a clear performance problem and its scope is critical in database performance tuning. It's essential to know exactly what is slow and how slow it is, and to understand whether the issue is limited to specific queries or users, or is more widespread."*

*Cecilia Grant*
*Oracle Performace Tuning Expert*

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## OPTIMIZE QUERIES

A part of database performance tuning may involve optimizing queries, as performance problems can oftentimes be related to poor queries.

At the most basic level, a query is a real time request for data from a database. To boost your database performance, it is a good idea to optimize the most frequent queries your database server receives.

To begin the query optimization process, you should target specific queries that have a significant impact on query execution times, including queries that are occasionally or consistently slow or have red flags.

It can be difficult and time-consuming to manually optimize queries, so leveraging a query optimizer or outsourcing your optimization efforts can help improve database performance.

## IMPROVE INDEXES

In addition to queries, indexes are another essential element of a database. Indexing creates a "structure" that helps keep your data organized, which in turn, makes it easier to locate.

Proper indexing can improve your database performance as it increases the efficiency of the data retrieval process, saving you and the system time and effort.

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## REVIEW ACCESS

Monitoring who – and what – has access to your database at all times is key in ongoing database performance improvement.

Having an understanding of all the applications and services that are accessing your database can help you pinpoint performance bottlenecks to the specific source.

If a single service is having performance issues, but you are able to determine that it is contained to that one service, it is likely to be a quick fix with minimal impact on your other applications.

However, if you are experiencing interruptions across your entire database, it could be a larger issue with your servers or hardware.

## DEFRAGMENT DATA

Defragmenting your data is one of the most effective approaches you can take to increase database performance.

With data constantly being written to and removed from your database, it will inevitably become fragmented, which can slow down the data retrieval process or interfere with a query execution plan.

When you defragment your data, relevant data can be grouped together, allowing for I/O-related operations to run quicker and more efficiently.

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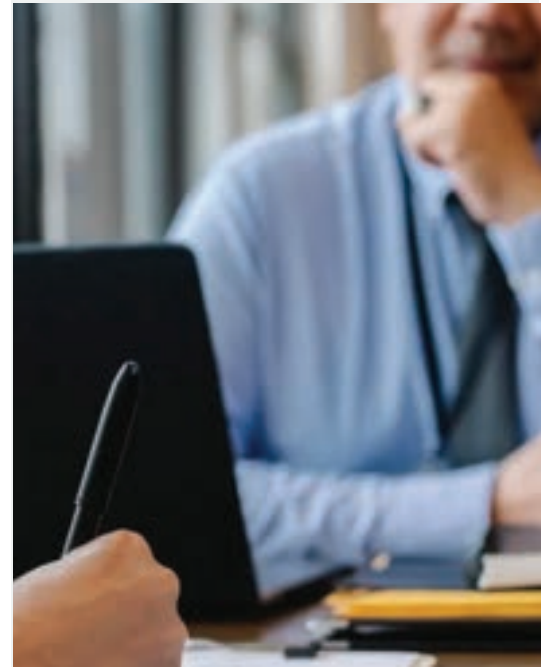
## IMPROVE DATABASE PERFORMANCE WITH BUCHANAN

Databases are perhaps the most important component of your enterprise, so continuously optimizing database performance should be a priority from company leadership to database administrators.

While the tips outlined above can help you optimize your systems and processes, database performance is an ongoing endeavor that typically involves multiple stakeholders to yield the best results.

If your organization does not have the bandwidth, resources, or budget to manage and optimize database processes in-house, or if you are unsure how to improve database performance, consider partnering with a managed service provider like Buchanan with database experience.

If you are still wondering how to improve DB performance, our knowledge and expertise can offer guidance on the most impactful ways to improve database efficiency.

Contact Buchanan today to learn more about our Managed Database Services, and how our team can help optimize and enhance your database.

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