In 2022, big data will rule. Data analysis and use are, in essence, necessities for everyone. To organise elections, for instance, the government will compile a lot of data. and stuff from the web In this course, the data is analysed using MongoDB and Oracle, and processing is done using SQL or MQL. We shall examine and contrast Oracle and MongoDB in this paper. Here is my comparison and analysis of this report.

**Query Performance**

First, I'll analyse and discuss how Oracle and MongoDB differ in terms of query performance. When using condition-related documents, the performance of MongoDB updates will be about 33.9% faster than Oracle's. The causes are as follows. When discussing query performance, it is important to keep in mind that Oracle is both a relational and a non-relational database. Comparison of query performance between relational and non-relational databases by Michael Kvet According to the statistical experiment in this article, 100000 records are retrieved from the two databases, Oracle and MongoDB, in 0.091 and 0.005 milliseconds, respectively. Oracle inserts data at a ratio of 1:3, deletes data at a ratio of 1:6, updates data at a ratio of 1:9, and receives data from the database at a ratio of 1:3. This ratio shows that insert represents the biggest difference. In terms of time, it starts working at 1:15. According to this study, the main distinction between MongoDB and Oracle is that MongoDB uses non-relational data, so its performance is always going to be quicker.

**Resource requirements**

In the section on resource needs, I'll contrast MongoDB vs Oracle. In order to use MongoDB, we need Intel x86 64, which requires a Sandy Bridge or later Core processor, a Tiger Lake or later Celeron or Pentium processor, or AMD x86 64, which requires a Bulldozer or later processor. First, I'll compare the hardware in the CPU part of Oracle, where the minimum requirements are AMD64 and Intel EM64T. Oracle requires a minimum of 2 GB of physical memory (RAM). You just need 50% (1 GB) or 256 MB for MongoDB. Thus, MongoDB performs better than Oracle in terms of capacity. In terms of disk space, the Man MongoDB product installation requires at least 500 MB of disc space, and Oracle has two installation kinds, the sum of which is made up of the 10 GB normal instal type and the 10 GB advance instal types. We are aware that MongoDB employs Compared to Oracle, the capacity is substantially lower. Finally, this software must save 1.22 MB of data every 100 milliseconds in the MongoDB network bandwidth area, which will result in a significant system latency. It is advised to employ a dedicated rate of at least 1.5Mbps in the oracle, with a maximum transmission speed of roughly 50MBps.

**Security issues, such as SQL injection**

Regarding concerns about security, I'll describe two security vulnerabilities with Oracle and MongoDB. I'll also touch on two security-related topics. First MongoDB Authentication Most involving MongoDB are caused by a lethal confluence of MongoDB opening to the internet and authentication being removed. MongoDB has support for authentication at the database level, although it does not handle complicated passwords. Data encryption in MongoDB is another. The fact that data files are not secured at rest is one of MongoDB most critical issues. Data leakage problems are quite likely if the files are not encrypted. Patching problems are at the root of the security vulnerabilities that Oracle is currently experiencing. Oracle has always had a highly severe attention flow, which makes timely patching extremely important. With regard to the vast danger surface, Oracle has made adjustments and updates to address these leaks in recent years. However, the sheer volume of features and choices offered by Oracle results in a greater threat surface and more chances for attackers to target. Many functionalities that come standard with Oracle are rarely used by many businesses. Almost all Oracle packages have occasionally malfunctioned.

**ACID properties, transaction, and concurrency control**

In MongoDB the ACID transactions MongoDB

Single-document updates have always been atomic in MongoDB. The Document paradigm is useful for storing linked data that is accessible in a single Document (as opposed to a relational model where the related data may be normalised and split across multiple tables). If your document schema is well-designed, you can often operate without the requirement for multi-document transactions.

When multi-document ACID compliance is required, MongoDB transactions in your cluster behave as expected. Since transactions in distributed systems include performance overhead, you must also take into account resource constraints and performance goals.

Now that we have a better idea of what ACID transactions are, let's look at how to implement MongoDB ACID transactions. The tutorial that follows will show you how to create ACID transactions in MongoDB using Mongo Shell.

ACID transactions for Oracle

We 'll analyze ACID from the Oracle first. Multiple operating systems make up Oracle's ACID. A single logical unit of work will be established in the database for each operation. These logical units might be the entirety of a programme, a subsection, or anything else. If the transaction succeeds, the database will shift from one consistent state to another. A single sql command this may need many database operations

Scalability

Scalability With MongoDB Atlas, these subjects are covered:

How to scale vertically versus horizontally and which to use

Proactive vs reactive scaling

How to pick the cluster size and tier

Auto-scaling of the Atlas cluster

Sharding and horizontal scaling

elastic scalability and serverless computing

Scalability in oracle

The throughput capacity, which is inversely correlated to the hardware resources made available by the system and feels confined by the hardware resources, is the first feature of Oracle's scalability. You can manage ever more challenging queries with a scalable system without compromising time throughput. To improve the performance of Oracle Apply Service for systems, the workload can be divided over a cluster of servers. The excellent vertical scalability of Oracle Application Service enables several virtual machines to be deployed in the same environment with the same file configuration.

Ability to handle massive volumes of data

Big data processing in MongoDB is extremely quick—some may even say lightning-fast—allowing for the production of insights in practical time frames. To record market movements in microseconds, stock trading software, for instance, will employ MongoDB. Because each user will make several actions when playing online games, millions of data points will need to be processed at once, therefore MongoDB can process massive data very quickly.

Big data processing in Oracle happens extremely quickly. The fastest data is typically written straight to the RAM rather than the hard disc. Some intelligent Internet-connected items function very instantly. Need to carry out analysis and action.

**Ability to execute complex queries**

In comparison to Oracle, MongoDB offers greater flexibility and makes it easier to query complicated data. With truth, building filters and queries dynamically in MongoDB is fairly straightforward. There is no need to be concerned about the path's position or open areas. Problem: In the "SORT" statement, we don't have to worry about concatenating or dynamically changing the names of the returned fields in between "SELECT" and "WHERE." It is relatively simple and straightforward to write parameter replacement, especially when there are dynamic logical "AND" and "OR" expressions available.

**Data integrity**

5 different type of data integrity in MongoDB

First, data integrity refers to maintaining the accuracy and consistency of data over time. Because it guards against data loss and corruption, MongoDB also values data integrity. Furthermore, data integrity This is done through a variety of methods, such as data backup, data validation, and data cleansing. Fourth, data integrity must be considered when using MongoDB since it helps prevent data loss and corruption. Last but not least, there are a number of ways to ensure data integrity. the use of MongoDB All of these must be taken into consideration.

6 different type of data integrity in oracle

NOT NULL: “Allows or disallows inserts or updates of rows containing a null in a specified column.”

Unique key: “Prevents identical values from appearing in numerous rows in the same column or group of columns but permits certain values to be null.”

Primary key: “combines the unique constraint with the NOT NULL constraint. It forbids the use of null values and the occurrence of numerous rows with the same value in a single column or group of columns.”

Foreign key:” identifies a column as the foreign key and creates a connection between the foreign key and the referenced key, which is a main or unique key.”

Check: “Requires a database value to obey a specified condition”

Differences in (for example media) data types

12 different types of data types in MongoDB

1. String
2. Integer
3. Boolean
4. Double
5. Date
6. Mix/Max keys
7. Arrays
8. Timestamp
9. Object
10. Null
11. Symbol
12. Regular Expressions

15 different types of data types in Oracle

1. CHAR (size)
2. VARCHAR2
3. NCHAR
4. NVARCHAR2
5. CLOB
6. NCLOB
7. LONG
8. NUMBE
9. DATE
10. BLOB
11. BFILE
12. RAW (size)
13. LONG RAW
14. ROWID
15. MLSLABEL

Between Oracle and MongoDB there have some data types are same like are DATE, NUMMBER.

Conclusion

In this report, I will make a summary. First of all, according to the analysis and comparison of the nine items I conducted, most of them will get a greater advantage from MongoDB, so now large Internet companies or processing websites will use MongoDB. , because both the speed of processing data and the processing method of complex data are much better than Oracle.

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