How does time-series database change our lives

In recent years, with the rapid development of loT and 5G and other technologies, industrial Internet, smart home, monitoring and other industries have more and more demand for fine data division, but the traditional relationship database can not well meet the current demand. At this time, the time-series database emerged.

To talk about the impact of time-series database on people's life, we should first understand what is time-series database and what are the similarities and differences with the traditional relational database. Let's imagine a scenario in which the shadow of COVID-19 remains lingering in 2022. In one hospital, the number of people hospitalized in the outbreak on Monday was 10. By next Monday, it was up to 15, or 50 percent. But is it really so simple? If we had taken out the hospital statistics, we might have seen that five people were discharged on Wednesday, and then 10 more, and the growth rate was not 50% from Wednesday. The only reason why these two growth rates differ is time. Fine division of time, time as the spindle often can get more refined data, time series data analysis is much more profound than the pie chart or Excel. These data do not just take time as a measure, the key is to help us with the data analysis and get valuable information, which traditional databases struggle with.

The time-series database, with the unique data of timestamp, is administratively different from the traditional relational database. Time sequence data often has the following three characteristics: the written data is all new data, the data is written in chronological order, and the time is used as the main axis. In short, the time-series database tracks the changes of the entire system into the INSERT operation, rather than the UPDATE operation of the traditional database. For example, as a common item in our daily life, the surveillance cameras' video data is often collected with a time stamp, that is, the timing data. When the monitor collects new data, does it override the original data, or create a new data? Save as a new data with a timestamp for efficient data discovery. In other words, the writing of temporal data is usually an "append" rather than a simple "change".

But with time stamps, traditional databases can do, why create a new type of database? In fact, it is true that people have been using traditional databases to do these functions, but creating a new database can better meet people's daily requirements. As a kind of data with time stamp as the main axis, timing data is a kind of extremely rapidly growing data. 90% of all the data in the world is timing data, so it can be seen that the amount of data is huge and the growth rate of data is extremely fast. Therefore, for a database to store timing data, the first requirement is to meet the storage and rapid retrieval of a large amount of data. Traditional databases partially compromise most of the demand for massive storage and retrieval speed to meet most of the data. And that is the advantage of time-series databases. time-series databases view time as a first-consideration factor, which enables it to provide large-scale performance improvements, including higher throughput and faster large-scale queries, and better data compression. Meanwhile, the time-series database also has a higher availability. In general, time-series databases have time-stamp-based correlated built-in functions and operations, such as continuous queries, time aggregation, and so on. These class operations provide users with a better experience, such as in encrypted financial operations and asset tracking projects, where timestamp-based data operations can provide a deeper experience. Over the past decade, our operations on timing data tend to store it separately from traditional data, which leads to difficult manipulation and data redundancy in some cases. The time-series databases hold these data in a database, greatly reducing the application development time to facilitate rapid decision making.

But is all the data time-series data? In the vast majority of cases, the answer to this question is yes. Almost all the data can be derived from time sequence data, such as project control, or this article, etc., there is a "log" thing, and when we observe the evolution of actual things, we need to observe it with time. We have time sequence data, but sometimes we don't realize it. For example, if we visit a website, we must see the latest form of the website, but if you want to find the historical version of the web page, you can still get a timeline-oriented list of historical versions. We recognize that many applications may never need timing data (preferably using the Current Status view). But as we continue moving along the exponential curve of technological advances, these "views of the current state" have become less necessary. Instead, we find that increasing amounts of data stored in temporal form often helps us to understand it better.

So what is the value of time-series data for the current society? First, the size and amount of data must be growing, and an effective database should be able to process and uptake inherent, uninterrupted temporal data streams, reducing any negative performance impact or delay. The time-series database does this well because it makes all aspects faster by querand manipulating time stamps, and time is an important part of it. With the increasing amount of data, it becomes very difficult to accurately query a certain data. Time sequence database takes advantage of its time-stamp characteristics to query and update the data definition more easily, so that big data can be operated easily and quickly. In the era of big data, the reliability of data also needs to be guaranteed. As a special database, time-series database tracks the changes of the entire system into INSERT operation rather than UPDATE operation of traditional database. What's the benefit of this? When you do a misoperation, the original correct data is not overwritten, and you can easily recover the original data. With a "history" of data changes, errors can be received and fixed.

Everything has two sides, and the time-series database has many advantages, but also comes with a part of the disadvantages. First of all, the current time-series database still needs to be improved in the storage aspect, which is either stand-alone, or difficult to maintain, and there are many places to be modified. Special time-series database is a phased product, appearing in order to solve the contradiction between supply and demand in a specific historical period. The third generation of super-fusion time-series database solves many problems left over by the special time-series database with new ideas, and becomes the mainstream of the future development of time-series database. At present, many dedicated time-series databases have also started or planned to add more features, and the boundaries of data products will become more and more blurred. Different timing data have different disadvantages, such as limited OpenTSDB query function, HBase dependence, complex operation and maintenance, weak aggregation and analysis ability, while InfluxDB open source version has no cluster function, compatibility problems between before and after versions, changing storage engine, and so on. The current time-series database is still far from the ideal type, which still needs to make continuous progress, but we can begin to look at what benefits the time-series database will bring to our big data society.

Time series database has a very broad application scenarios in today. Time database application scenario in the Internet of things and Internet APM application more, the following is listed some time-series database application scenario: in terms of public security, can through the time-series database on the Internet records, communication records and so on individual tracking and interval tracking, on the Internet, can test the server application, detailed storage activity log, ensure the system recovery and effectiveness, in the financial industry, for transaction records, access records and POS machine tracking is of great help. The above is only a part of the use scenario of the time sequence database, but not all. Time sequence database will have a wider and more profound use in the current era of big data! Time sequence database is a relatively new technology, there is no industry standard, there are many aspects that have yet to be improved, and this perfect step needs to be completed together. The world requires us to make data-driven decisions faster and better. Traditional static data cannot solve this problem. To meet your needs, you need to collect data with the highest possible fidelity. —— This is what timing data provides: everything that happens in the system can be stored like a movie, whether in software, physical power plant, game, or application customers. These examples are just the tip of the iceberg, with unlimited flexibility in how to query and model data. time-series databases like FastData For TSDB can help us analyze and discover meaningful data to support rapid decision-making.

The Time sequence database has had a profound impact on our lives, so let us look forward to the future of the time-series database, and we hope that it can become better and better, and bring more benefits to our daily life!