The Future of Database Is Now

Alibaba Cloud

The Third Issue

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ABOUT US

Empower The Amazing Digital Intelligence

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way and the online model is not as simple as 1, 2, 3. Every enterprise needs to find its path based on historical accumulation.

We have used our technical solution of databases during the Double 11 Global Shopping Festival, and many retail enterprises have been benefitting. We want to support more entrepreneurs' success with our technologies and practices.

Empower the amazing Digital Intelligence to support more businesses' success.

The database technology has been through three generations' with great contributions from Mr. Bachman, Mr. Codd, and Mr. Gray. These three contributors are also winners of the Turing Award. Databases have been the fundamental element in the enterprises that plays an important role in their business' development.

There are so many uncertainties in the world. Improving an enterprise's ability and sustainability has become more critical. For instance, a retail company may have many sleeping resources internally, but learning how to activate them is what may lead to innovative business models or creative business areas. This should be the focal point and the true treasure of the company.

This year, despite the challenges with COVID-19, online business models have not been neglected, and many entrepreneurs have been seeking the transformation to sustain businesses with online models. At the same time, combining the traditional

Let Your Database Amaze

By Stephanie Gao

Migration to cloud-based databases is now a global trend. A recent report from Gartner says 75%of all databases will be deployed or migrated to a cloud platform by 2022: "Organizations are developing and deploying new applications on the cloud and moving existing assets at an increasing rate, and we believe this will continue to increase."

Today, Alibaba Cloud has an extensive portfolio of database products. Our database services can provide your businesses robust database engines with the data backup, recovery, monitoring, migration, and disaster recovery solutions it needs. Every database solution provides enhanced security, not only pre-protecting database instances but also automatically encrypting business intelligence to prevent attacks on the cloud.

This extensive range of database services gives enterprises the availability and security required to operate in today's data-heavy world. This also explains why over 400,000 database instances have been migrated to Alibaba Cloud, including many top retail, finance, telecommunication, manufacturing, and logistics enterprises. The wide range of offerings provides enterprises with the best technology tool to reap the rewards from today's corporate currency data.

"Challenger" in the Gartner Magic Quadrant

Let us share a few key differences between Alibaba Cloud's database services:

Extensive Product Portfolio - Alibaba Cloud offers one of the most extensive portfolios of cloud database solutions and can provide the necessary solutions to store, process, analyze, and manage data to support and add value to businesses. Our database systems support all the mainstream, open-source, and commercial database solutions, including MongoDB, PostgreSQL, MySQL, SQL Server, and Redis, and the cloud native PolarDB and AnalyticDB

Proven Reliability and Scalability - Alibaba Cloud's databases can empower businesses, no matter the scale. Database solutions, with PolarDB and AnalyticDB, supported Alibaba's systems behind the annual Double 11 Global Shopping Festival, China's Black Friday, the world's largest online shopping event.

Large and Growing Customer Base - Our database solutions have supported over 100,000 customers with more than 400,000 databases hosted on Alibaba Cloud. Alibaba Cloud is the #1 choice among cloud database providers in the Asia Pacific.

Paired with Powerful AI Solutions - Integrated with new and innovative AI solutions, our databases come with features, such as auto-recovery and auto-optimization, so businesses can be more equipped in the cloud-native revolution.

These competitive advantages were recognized by the world-leading research and advisory institute Gartner. Gartner positioned Alibaba Cloud Database as a "Challenger," in its recent 2019 Gartner Magic Quadrant of Operational Database Management Systems report. Gartner's updated research shows that Alibaba Cloud's rapid progress in database technologies over the past year is widely recognized by the global market.

According to Gartner, "Alibaba Cloud owns the most extensive database products among all cloud database providers, including their customized and open-source database products."

The Secret Technology behind the Double 11 Global Shopping Festival

Since 2009, the Double 11 Global Shopping Festival has taken place every year on November 11. Every year, it sets new standards for the global e-commerce industry, continually generating record-breaking revenues, and creating an innovative retail experience for consumers. The event has grown substantially over the last decade, with increasing data read and write requests threatening to affect database performance. Its success is undeniably attributed to Alibaba Cloud's new era of self-developed database solutions.

For our example, Alibaba Cloud's PolarDB has been used to support Alibaba Double 11 shopping events. ApsaraDB solutions ensured that networks and systems were scaled to process during Double 11 without incidents. This was especially important during the unpredictable traffic spikes.

Elasticity is another key requirement for an event of this magnitude. Alibaba Cloud's Database Team achieved elasticity by using a hybrid server environment for the Double 11 Global Shopping Festival. By isolating the storage and computing resources, the database could allocate massive computing resources during Double 11, supporting excellent elasticity, and release them immediately after the event. By using cloud resources and the hybrid deployment technology, the cost of the peak transaction traffic was also minimized.

Digital intelligence is being embraced to help further optimize the Double 11 Global Shopping Festival. For example, in 2017, Alibaba Cloud used intelligent technology for automatic SQL optimization for the first time. Since then, Alibaba Cloud has been enhancing automatic SQL optimization and automatic space optimization across the network. This mitigated the workload of DBAs, improved developer efficiency, and effectively promoted database stability.

With more than 10 years of experience accumulated from Alibaba's business development and from learning to empower customers in various verticals, Alibaba Cloud database services have continually impressed customers across the globe with our cutting-edge technology and innovation. In this issue, we will read some success stories from our domestic and international customers that have reshaped their business after unlocking the value of data with the help of Alibaba Cloud's database technology.

The Database Team at Alibaba Cloud continually innovates, releasing numerous products and updates. We have summarized our latest achievements in the infographic below.

Let your digital intelligence amaze!

Scan the QR-code to view an infographic about What's New with Alibaba Cloud Database.

The Future of Database

In 2020, Feifei Li was interviewed by YourStory, a leading tech media company from India, about the future of databases. This story is an excerpt from the interview.

Feifei Li is currently a Vice President of Alibaba Group, ACM Distinguished Scientist, President of the Database Products Business Unit of Alibaba Cloud Intelligence, and Director of the Database and Storage Lab of DAMO Academy. He has won multiple awards from NSF, ACM, IEEE, Visa, Google, HP, Microsoft, and IBM. He is a recipient of the ACM SoCC 2019 Best Paper Award (runner-up), the IEEE ICDE 2014 10 Years Most Influential Paper Award, the ACM SIGMOD 2016 Best Paper Award, the ACM SIGMOD 2015 Best System Demonstration Award, and the IEEE ICDE 2004 Best Paper Award. He has been an associate editor, PC co-chairs, and a core committee member for many prestigious journals and conferences. He has led the R&D efforts of cloud-native database systems and products at Alibaba.

Introduction:

With the rapid development of computing and digital intelligence on the cloud, cloud-native databases and data warehouses utilize cloud-native technologies to maximize the flexibility of the pooling of computing and storage resources will be the future. With the in-depth use of AI technology, the database will become more and more intelligent. Alibaba Cloud's goal is to realize the complete automation and intelligence of the database.

What is changing in database technologies and where is this tech heading?

Feifei Li: Database is a mature technology and has been around for 40 years, especially relational databases.

With the rapid development of computing and digital intelligence on the cloud, computing and storage resource pooling has brought subversion of the system design of the traditional databases. So what kind of database can evolve and achieve rapid development in the technological world?

Not many people realize that the cloud was a virtualization of resources, such as storage and compute. These resources are bundled as a pool and sold as infrastructure-as-a-service. This is amazing because the cloud is elastic and easily scalable, and the reason why you see the proliferation of new startups.

Instead of working with fixed costs, you can work on a pool of resources with a variable cost. That's why business conversations are now about elasticity and high availability. You can be highly available if you are on the cloud; there will be zero downtime.

Now let's come back to a cloud-native database. Cloud-native database systems have been around since 2005. Storage, network, and virtualization were the first disruptive technologies to take off as the cloud offering. After that, a lot of changes happened in the platform layer with algorithms coming in by 2014. Tech disruption happens layer by layer, so a database is no longer legacy.

Unlike the legacy database system that bundles compute and storage together, our cloud-native database, the PolarDB, decouples compute, and storage. This benefits companies to scale up or scale back down for storage and compute. You can manage the CPU or DB through a button; it is automated. At Alibaba, we have Database Autonomy Service (DAS) that can automate and monitor workloads without having people to do tasks. It is on-demand and elastic, which means businesses save on cost.

In addition, the traditional OLAP database system is rapidly evolving to a new generation of cloud-native data warehouses, providing real-time online interactive analysis services for massive data. The offline big-data computing system evolved from the database system is also rapidly merging with the database system.

The integration of the database system and the big data technology will develop further. Using the above mentioned cloud-native architecture to provide serverless, compute and storage decoupling, elastic high availability, high concurrency online interactive analysis and computing is the development direction of the new generation of cloud-native data warehouses.

Our AnalyticDB (ADB) is designed and implemented based on these principles, providing efficient online interactive analysis of big data. Looking into the future, both OLTP and OLAP systems will develop in the direction of continuous improvement of HTAP capabilities. At the same time, the distributed architecture combined with shared-nothing and the cloud-native architecture of shared-storage/shared-everything will merge, using cloud-native and distributed capabilities to provide the next generation of enterprise-level database systems. It even includes NewSQL.

What is NewSQL?

Feifei Li: Jargon and terminologies apart, I have to explain this technically and talk about the relationship between the old traditional unstructured and semi-structured data storage and relational database management systems.

Earlier, a big part of the database business needed to ensure ACID (atomicity, consistency, isolation, durability.) This meant ensuring that updates were consistent. To make sure performance was consistent, you needed systems to manage high throughput workloads and ensure consistency.

Businesses in the modern world needed a highly scalable database unlike those that offered a structured approach of working with data. A decade ago, rather than worrying about traditional requirements of consistency, it was important to scale horizontally with distributed solutions while handling massive data. That's how big data processing tools like MapReduce and Hadoop were born.

At the same time, the massive storage and processing of unstructured and semi-structured