AWS CLOUD DATABASES EXPLAINED: INNOVATION IN THE MULTI-CLOUD



In the technology industry, innovation is all about agility and performance. If a new technology product cannot keep up with the fast-paced, data-driven user ecosystem, chances are that product will soon be replaced by a better alternative…one that's developed by a startup firm that focuses all its internal resources on product innovation enabled by cloud computing capabilities such as cloud databases and multiload infrastructure.

But what exactly is cloud database? How does the AWS cloud database systems run in a multi-cloud world deliver innovation? Let's discuss!

(This tutorial is part of our AWS Guide. Use the right-hand menu to navigate.)

What is a cloud database?

A database is a collection of structured information. In the context of software engineering, the organized collection of stored data is controlled, managed, and modified according to the principles defined by a database management system (DBMS).

The structure of a DBMS is determined by different types of underlying data models, classified as relational and non-relational. Examples include:

- Network
- Hierarchical
- Object-oriented
- Object-relational

- Multidimensional
- Additional models

In the digital age, data grows exponentially and so the database storage systems must scale accordingly. On-premises servers are often insufficient to meet the growing needs of big data applications. Managing databases requires a suite of technology solutions governing all aspects of big data, including DBMS, security, analytics, infrastructure, and operations management.

All this encourages organizations to break free from legacy commercial databases that offer limited scalability, management controls and flexibility to integrate with competing products and standardized non-proprietary technologies.

AWS Cloud Database Service

Cloud computing has accelerated the transition from legacy databases to cloud-native alternatives with fully managed, built-in DBMS features. A popular example is the AWS Database solutions suite that lets users break free from…

- Legacy DBMS systems
- Punitive licensing
- Lock-in terms

By definition, a cloud database is any cloud-native database system, including the managed database services accessed from the cloud on a subscription-based pricing model. Cloud database systems allow users to spend time on application-centric work instead of spending time and capital on resource-intensive database management and administrative tasks.

Services such as the AWS database managed services allow organizations to take advantage of commercial-grade database capabilities at high performance, dependability and security as an affordable OpEx.

Cloud database examples

Consider the case example of Airbnb, one of the earliest customers of the AWS Relational Database Service (RDS) customers. Airbnb migrated its database workloads to the AWS database platform in 2010 and over the next three years, the company scaled its operations significantly:

- 2 billion rows stored in RDS (That's 150,000 listings at the Airbnb platform every day.)
- From 24 to over a 1000 EC2 instances
- From 300GB to 50TB of high-quality photos stored in AWS S3

Why did Airbnb choose the cloud database service model?

All of this growth and scale took only a five-person operations team. (We're impressed.) The cloud database service empowered Airbnb to concentrate its engineering efforts entirely on application development and innovation. AWS offered the tools and capabilities necessary to meet the fast-changing and growing database management needs of Airbnb, while the company was engaged in reinventing and disrupting the entire travel industry.

Multi-cloud enables innovation

Business organizations face a diverse set of requirements that are never entirely satisfied with a single server infrastructure model. They need the security and performance of an on-premises private cloud system, the scalability and cost optimization of a public cloud, and flexibility of a hybrid cloud datacenter—all delivered within a heterogeneous infrastructure environment.

(Read our cloud primer: public vs private vs hybrid.)

This is exactly what defines a multi-cloud environment. Multi-cloud refers to the combination of two or more cloud infrastructure environments. The services can come from different vendors, in different architectural models. The workloads are distributed selectively across the multi-cloud infrastructure systems and users can optimize the multi-cloud system for cost, scalability, performance, dependability, and technology capabilities.

Here's how a cloud database system fits in a multi-cloud environment to deliver innovation and performance in today's era of big data:

- **Cloud databases offer the features and familiarity of a legacy relational database system** without the associated limitations such as lock-in, high cost, administrative workload, performance issues, feature limitations and resource-intensive operations.
- **The management, security, flexibility, and scalability of cloud databases** is similar to that of a single-tenant application. Cloud database services such as AWS are purpose-built and feature rich, which enables highly customizable database operations within the scope of a third-party vendor managed service offering. This means that users have limited responsibilities on developing, managing, and maintaining a cloud database.
- **The pricing model is that of a shared multi-tenant service**. High CapEx is replaced by affordable OpEx.

Choosing a database in the cloud

Sifting through the thousands of cloud options isn't easy. When you opt for a single vendor, like AWS or Azure, you can take advantage of guidance and migration selection the company provides.

As always, consider your company's needs—your product, your competitive edge, and, perhaps most importantly, what your customers expect. Do your customers need the scalability and flexibility that the cloud offers?

Today, AWS still offers the most databases under the single umbrella. Google and Azure are a solid alternative, rapidly adding databases and serverless options. Still, your company may prefer the cutting-edge innovation of a multi-cloud solution, even with its inherent drawbacks. Review the list of cloud database services, the features and cost options before migrating your legacy database workloads to the cloud.

Related reading

- BMC Multi-Cloud Blog
- AWS vs Azure vs GCP: Comparing The Big 3 Cloud Platforms
- AWS Redshift vs Snowflake: What's The Difference & How To Choose?
- Cold vs Hot Data Storage: What's The Difference?

- The Cloud Today: Growth, Trends, Market Share & Outlook