Amazon Aurora, DynamoDB, Redshift and ElastiCache

Amazon Web Services

Amazon RDS on VMware

Amazon Relational Database Service (RDS) on VMware lets you deploy managed databases in on-premises VMware environments using the Amazon RDS technology enjoyed by hundreds of thousands of AWS customers. Amazon RDS provides cost efficient and resizable capacity while automating time-consuming administration tasks including hardware provisioning, database setup, patching, and backups, freeing you to focus on your applications.

Amazon RDS on VMware

Amazon Aurora

Amazon Aurora is a MySQL and PostgreSQL compatible relational database engine that combines the speed and availability of high-end commercial databases with the simplicity and cost-effectiveness of open source databases.

- Five times faster than standard MySQL

- Three times faster than PostgreSQL

- Fully managed service for provisioning, setup, patching and backups

- Amazon Aurora automatically grows storage as needed, up to 64TB

- Offers up to 15 low latency read replicas

- High Availability and Durability

Amazon Aurora

What is NoSQL

NoSQL is an approach to database design that can accommodate a wide variety of data models, including key-value, document, columnar and graph formats. NoSQL, which stand for **"not only SQL,"** is an alternative to traditional relational databases in which data is placed in tables and data schema is carefully designed before the database is built. NoSQL databases are especially useful for working with large sets of distributed data.

Amazon DynamoDB

Amazon DynamoDB is a NoSQL database that supports key-value and document data models, and enables developers to build modern, Serverless applications that can start small and scale globally to support petabytes of data and tens of millions of read and write requests per second. DynamoDB is designed to run high-performance, internet-scale applications that would overburden traditional relational databases.

Amazon DynamoDB

Amazon DynamoDB

NoSQL systems are not required to follow an established relational schema.

Non Relational (NoSQL)	Relational Database
Collection	Table
Document	Row
Key Value	Fields

Amazon DynamoDB

```
{
    "EmployeeID":  00108,
    "LastName":    "Major",
    "Firstname":   "John",
    "Address":   {
        "Street":  "165 Lloyd Road",
        "City": "London",
        "PostCode": "W1H 3RQ"
    }
}
```

Amazon DynamoDB

Key-value and document data models
- Flexible Schema
- Adapt tables to changing business requirements

Microsecond latency with DynamoDB Accelerator
- Improve the read performance of your DynamoDB tables by up to 10 times
- Time required for reads from milliseconds to microseconds

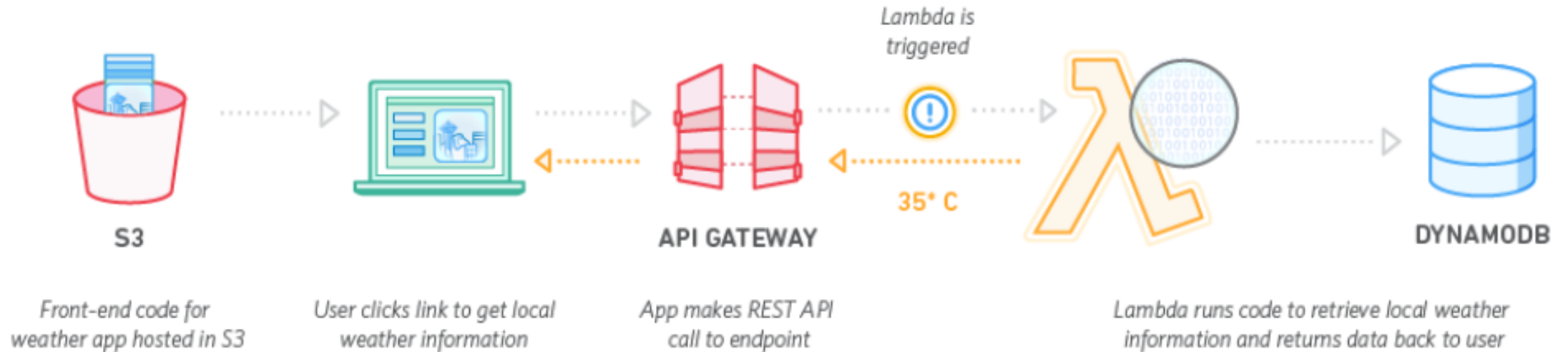**Automated global replication with global tables**
- Replicate your data automatically across your choice of AWS Regions
- Automatically scale capacity to accommodate your workloads
- Globally distributed applications can access data locally

Real-time data processing with DynamoDB Streams
- DynamoDB Streams capture a time-ordered sequence of item-level modifications in any DynamoDB table and store this information in a log for up to 24 hours.

Amazon DynamoDB – Use Case

Example: *Weather Application*

S3
Front-end code for weather app hosted in S3

User clicks link to get local weather information

API GATEWAY
App makes REST API call to endpoint

Lambda is triggered

35° C

Lambda runs code to retrieve local weather information and returns data back to user

DYNAMODB

Amazon Redshift

Amazon Redshift is a fast, simple to use, petabyte-scale data warehouse service. It delivers 10x better performance than other data warehouses and uses massively parallel architecture to deliver high throughput and sub-second response times. Redshift automates most of the common administrative tasks to manage, backup, monitor, and scale your data warehouse.

Amazon Redshift

Amazon ElastiCache

Amazon ElastiCache is a managed service that is easy to setup and scale an in-memory distributed cache environment. You get cost effective caching solution without having to design, deploy and provision your own caching environment.

Two engines offered are Memcached and Redis

- Amazon ElastiCache for Memcached is a Memcached-compatible in-memory key-value store service that can be used as a cache or a data store. It a popular choice for Web, Mobile Apps, Gaming, Ad-Tech, and E-Commerce.

- ElastiCache for Redis is a Redis- compatible in-memory service that delivers the ease-of-use and power of Redis along with the availability, reliability, and performance suitable for the most demanding applications. Its designed to power high-performance use cases such as web, mobile apps, gaming, ad-tech, and IoT.

Amazon ElastiCache

Next Video

Database Migration Service (DMS)