Database Service

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AWS Primary Database Options:

In the world of databases, there are two main categories:

(1) ***Relational Databases*** know as "***SQL***"
(2) ***Non-Relational Databases*** known as "***NoSQL***"

Amazon offers services for both types of databases:

RDS for SQL databases
and
DynamoDB for NoSQL databases

RDS

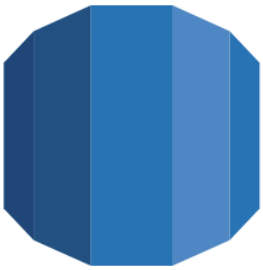
DynamoDB

What is RDS?

Simplified Definition:
Relational Database Service (RDS) is a ***SQL database service*** that provides a wide range of SQL database options to select from.

SQL Options Include:
(1) Amazon Aurora
(2) MySQL
(3) MariaDB
(4) PostgreSQL
(5) Oracle (several Oracle options are available)
(6) Microsoft SQLServer (several Microsoft options are available)

AWS Definition:
"Amazon Relational Database Service (Amazon RDS) is a web service that makes it easier to set up, operate, and scale a relational database in the cloud. It provides ***cost-efficient***, ***resizeable capacity*** while automating time-consuming administration tasks such as hardware provisioning, database setup, patching and backups. It frees you to focus on your applications so you can give them the fast performance, high availability, security and compatibility they need.



RDS

What is DynamoDB?

Simplified Definition:
DynamoDB is a ***NoSQL database service***. Unlike RDS, DynamoDB does NOT provide other NoSQL software options.

DymanoDB can replace (or is very similar to):
(1) MongoDB
(2) Cassandra DB
(3) Oracle NoSQL

AWS Definition:
"Amazon DynamoDB is a fast and flexible ***NoSQL database service*** for all applications that need ***consistent, single-digit millisecond latency at any scale***. It is a fully managed cloud database and supports both document and key-value store models. Its flexible data model, reliable performance, and automatic scaling of throughput capacity, makes it a great fit for mobile, web, gaming, ad tech, IoT, and many other applications."

DynamoDB

What is the Difference?

RDS (SQL)

(1) Stores related data in tables (using columns and rows).

(2) Typically used for very structured data, such as contact lists.

DynamoDB (NOSQL)

(1) Stores related data in JSON-like, name-value documents.

(2) Typically used for non-structured data such as cataloging documents.

What is the Difference/Benefits?

RDS:

(1) For when you need a SQL database option.
(2) Easy to set up, highly available, fault-tolerant, and scalable,
(3) Used when data is clearly defined.
(4) Common use cases include online stores and banking systems.

DynamoDB:

(1) For when you need a NoSQL database option.

(2) Fast, highly scalable, and fully-managed.
(3) Used when data is fluid and can change.
(4) Common use cases include social networks, web analytics.

What is ElastiCache?

Simplified Definition:
ElastiCache is a data caching service used to help improve speed/performance of web applications running on AWS.

AWS Definition:
"Amazon ElastiCache is a web service that makes it easy to deploy, operate, and scale an in-memory data store or cache in the cloud. The service improves the performance of web applications by allowing you to retrieve information from fast, managed, secure in-memory data stores, instead of relying entirely on slower disk-based databases. Amazon ElastiCache supports two open-source in-memory engines."

Redis: A fast, open source, in-memory data store and cache
MemcacheD: a widely adopted memory object caching system.

ElastiCache

What is RedShift?

Simplified Definition:
Redshift is a ***data warehouse*** database service designed to handle ***petabytes*** of data for analysis.

AWS Definition:
"Amazon Redshift is a fast, ***fully managed data warehouse*** that makes it simple and cost-effective to analyze all your data using standard SQL and your existing Business Intelligence (BI) tools. It allows you to ***run complex analytic queries against petabytes of structured data***, using sophisticated query optimization, columnar storage on high-performance local disks, and massively parallel query execution."

RedShift

What is the major difference between AWS's RDS and DynamoDB database services?

- RDS offers NoSQL database options, and DynamoDB offers SQL database options.

- RDS offers on SQL database option, and DynamoDB offers many NoSQL database options.
- RDS offers SQL database options, and DynamoDB offers a NoSQL database option.
- None of the above

Migration DataBase:

Migrating your Oracle data warehouse to Amazon Redshift can substantially improve query and data load performance, increase scalability, and save costs. Amazon Redshift is a fast, fully managed, petabyte-scale data warehouse that makes it simple and cost-effective to analyze all your data using your existing business intelligence tools. AWS Database Migration Service and AWS Schema Conversion Tool make it easier to migrate your schema and data from your Oracle data warehouse, both on-premises and on AWS, to Amazon Redshift without disruption to the applications that rely on the data source.

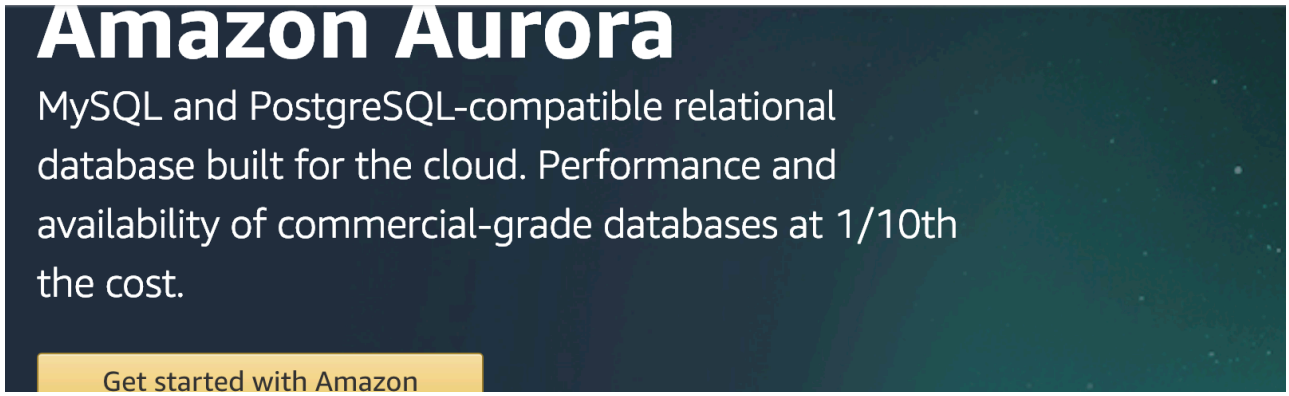
What you'll accomplish:

Convert the data warehouse schema and code from a sample Oracle data warehouse running on Amazon Relational Database Service (Amazon RDS) using the AWS Schema Conversion Tool (AWS SCT). AWS SCT helps you automatically convert the source schema and majority of the custom code to a format compatible with Amazon Redshift. AWS SCT clearly marks any code that it cannot convert so that you can manually convert it.

Migrate data from the Oracle data warehouse to Amazon Redshift using the AWS Database Migration Service (AWS DMS). With AWS DMS, you can begin the data migration with just a few clicks in the AWS Management Console. The source data warehouse remains fully operational during the migration.

Perform post-migration activities such as running SQL queries to validate object types, object count, and number of rows for each table between source and target data warehouses.

Aurora:



Amazon Aurora is a MySQL and PostgreSQL-compatible relational database built for the cloud, that combines the performance and availability of traditional enterprise databases with the simplicity and cost-effectiveness of open source databases.

Amazon Aurora is up to five times faster than standard MySQL databases and three times faster than standard PostgreSQL databases. It provides the security, availability, and reliability of commercial databases at 1/10th the cost. Amazon Aurora is fully managed by Amazon Relational Database Service (RDS), which automates time-consuming administration tasks like hardware provisioning, database setup, patching, and backups.

Benefits

High Performance and Scalability

Get 5X the throughput of standard MySQL and 3X the throughput of standard PostgreSQL. This performance is on par with commercial databases, at 1/10th the cost. You can easily scale your database deployment up and down from smaller to larger instance types as your needs change, or let Aurora Serverless handle scaling automatically for you. To scale read capacity and performance, you can add up to 15 low latency read replicas across three Availability Zones. Amazon Aurora automatically grows storage as needed, up to 64TB per database instance. Learn more: MySQL | PostgreSQL

High Availability and Durability

Amazon Aurora is designed to offer greater than 99.99% availability, replicating 6 copies of your data across 3 Availability Zones and backing up your data continuously to Amazon S3. It transparently recovers from physical storage failures; instance failover typically takes less than 30 seconds. You can also backtrack within seconds to a previous point in time, to recover from user errors. With Global Database, a single Aurora database can span multiple AWS regions to enable fast local reads and quick disaster recovery. Learn more: MySQL | PostgreSQL

Highly Secure

Amazon Aurora provides multiple lev security for your database. These incl network isolation using Amazon VPC, encryption at rest using keys you crea control through AWS Key Manageme Service (KMS) and encryption of data using SSL. On an encrypted Amazon instance, data in the underlying stora encrypted, as are the automated back snapshots, and replicas in the same cl Learn more: MySQL | PostgreSQL

MySQL and PostgreSQL Compatible

Fully Managed

Amazon Aurora is fully managed by Amazon

Migration Support

MySQL and PostgreSQL compatibility

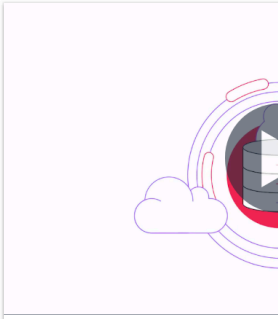
RDS:


RDS)

Get started with Amazon RDS

Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud. It provides cost-efficient and resizable capacity while automating time-consuming administration tasks such as hardware provisioning, database setup, patching and backups. It frees you to focus on your applications so you can give them the fast performance, high availability, security and compatibility they need.

Amazon RDS is available on several database instance types - optimized for memory, performance or I/O - and provides you with six familiar database engines to choose from, including Amazon Aurora, PostgreSQL, MySQL, MariaDB, Oracle Database, and SQL Server. You can use the AWS Database Migration Service to easily migrate or replicate your existing databases to Amazon RDS.



Understanding Amazo Service (1:53)

RedShift

Amazon Redshift

Fast, simple, cost-effective data warehouse that can extend queries to your data lake

Get started with a free 2-month trial

Follow the Getting Started Guide

Amazon Redshift is a fast, scalable data warehouse that makes it simple and cost-effective to analyze all your data across your data warehouse and data lake. Redshift delivers ten times faster performance than other data warehouses by using machine learning, massively parallel query execution, and columnar storage on high-performance disk. You can setup and deploy a new data warehouse in minutes, and run queries across petabytes of data in your Redshift data warehouse, and exabytes of data in your data lake built on Amazon S3. You can start small for just $0.25 per hour and scale to $250 per terabyte per year, less than one-tenth the cost of other solutions.

To create your first Amazon Redshift data warehouse, follow our Getting Started Guide and get the most out of your experience. Contact us to request support for your proof-of-concept or

What is Amazon R

n Relational Database

Redshift?

the most out of your experience. Contact us to request support for your proof-of-concept or evaluation.To accelerate your migration to Amazon Redshift, you can use the AWS Database Migration Service (DMS) free for six months. Learn more »

Benefits

Benefits of running in RDS instead of our own EC2 instance :

In click of few buttons we can :

- Automated minor updates.
- Multi-AZ deployments with a single click.
- Automated recovery in event of failure.
- Automated backups.
- No need to manage underlying OS & security.

Trade Off : Cannot optimize MySQL configuration at fullest level.
Cannot create MySQL cluster.