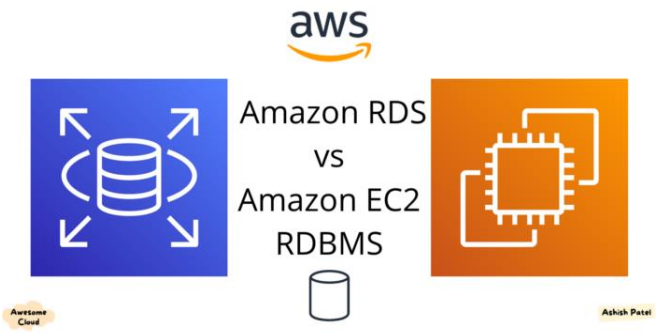
AWS — Amazon RDS vs Amazon EC2 Relational Databases — Comparison

Difference between Amazon RDS and Amazon EC2 Relational Databases in AWS.



Summary

You've decided to migrate your applications from on-premises to AWS and are considering what cloud services are available that suit your needs the best. When you are migrating an application that uses a relational database backend (RDBMS) such as Oracle, MySQL or SQL Server to the cloud, the question of whether to use Amazon RDS vs AWS EC2 will inevitably surface.

You need to decide whether to:

- Use the AWS' Relational Database Service (RDS) or
- Host a database server on an AWS EC2 (Elastic compute) instance.

TL;DR:

Amazon RDS enables you to run a fully featured relational database while offloading database administration. Whereas, for more control and flexibility, EC2 will be better for your relational database.

If you want an automated and cost-effective solution, go for RDS. With Amazon RDS, AWS will take care of your database from end-

to-end. AWS offers an automated process for configuring, managing, maintaining, and securing. Whereas, for more control and flexibility, EC2 will be better for your relational database.

RDS vs EC2 differences:

Administration

In RDS, AWS takes full responsibility for your database. The entire process of configuration, management, maintenance, and security is automated by AWS. RDS is easy to set up, cost-effective and allows you to focus on more important tasks. RDS is easy to set up, cost-effective and allows you to focus on more important tasks.

EC2 gives you full control over your database, OS and software stack. It allows you to hire your own database administrators. They will help you manage your database by looking after backups, replication, and clustering. It

Availability

RDS is a highly available relational database. It automatically creates a primary DB instance and replicates the data side by side to a standby instance in a different Availability Zone.

With EC2, you have to set up your database for high availability.

Scalability

Scaling up your database is comparatively easier with Amazon RDS. This can be done by adding replicas. It allows you to easily configure

read replicas or set up synchronous replication across availability zones for enhanced performance, availability, and durability.

With EC2, you have to setup such architecture (Availability Groups, Sharding, and more) manually with help of other EC2 instances and load balancer.

Backups

RDS offers automated backups. Plus you can get snapshots on-demand and keep them with you as long as you wish to.

With EC2, you have to take care of backup.

Performance

RDS offers Provisioned IOPS or PIOPS to achieve fast, predictable, and consistent Input/Output performance.

EC2 allows you to meet unique performance, replication, archival or DR requirements by giving you the required flexibility. You can choose the EBS (SSD) volume as per the your need.

Storage

In RDS, you get 3 types of storage options:
• *General Purpose SSD:* It offers cost-effective storage that is ideal for a broad range of workloads. These volumes deliver single-digit millisecond latencies and the ability to burst to 3,000 IOPS for extended periods of time.

• *Provisioned IOPS:* It is designed to meet the needs of I/O-intensive workloads, particularly database workloads, that require low I/O latency and consistent I/O throughput.
• *Magnetic:* It supports magnetic storage for backward compatibility.

In EC2, you get the following:
• You can get up to 8000 IOPS and 800 MBPS with provisioned IOPS and the right EC2 instance (It depends on instance type).
• You can use EBS RAID and striping configurations for higher and better performance.

Compatibility

RDS supports Aurora, SQL Server, MySQL, MariaDB, PostgreSQL, and Oracle.

With EC2, you can configure any database you want.

Control

With RDS, You don’t have control over the system.

EC2 offers complete control over the system. Complete control is one of the key benefits of EC2.

Security

RDS offers encryption at rest and in transit. Data that is encrypted at rest includes the underlying storage for DB instances, Read Replicas, its automated backups and snapshots.

In EC2, EBS volumes are encrypted to protect your data, both at rest and in motion. This is majorly beneficial when traveling from EBS volume to EC2 instance.

Pricing

It depends on RDS and EC2 instance type. You can estimate the cost using the AWS cost calculator.

Summary

If you want an automated and cost-effective solution, go for RDS. Whereas, for more control and flexibility, go for EC2.

RDS has a little edge over EC2:
1. Optimized DB Solutions & Replication: There is no need to manually set up database mirroring and failover clusters since you get highly optimized database solutions and synchronous Multi-AZ replication.
2. Outsource tasks: You can outsource tasks like database provisioning, security, and updating versions. No need of DBAs.
3. Focus on important tasks: It allows you to focus on tasks like schema optimization and performance tuning.
4. Automatic Backups: In case of a disaster, RDS manages your backups automatically.

However, EC2 is also preferred by few people:

1. Full control: It gives you maximum control over software stack, database, and OS.

2. Database Admins: Manage your database by looking after clustering, replication, and backups.

3. More features: You can use SQL Server features that aren't currently supported by Amazon RDS. *(Now RDS supports SSRS)*

4. High Performance: It allows you to exceed your maximum database size and performance needs.

The entire decision goes down to what you want — control or automated processes, cost of time, and the skills to manage.

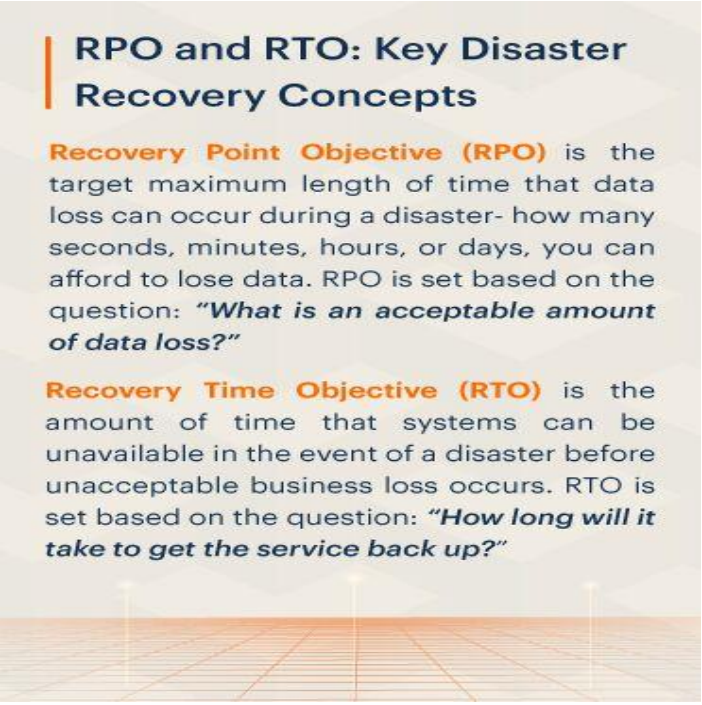
Happy Clouding!!!

What is Amazon RDS?

Amazon Relational Database Service (Amazon RDS) is a managed Database-as-a-Service (DBaaS) that makes it easy for IT administrators to set up, operate, and scale relational databases in the cloud. RDS is available for popular database engines including MySQL, MariaDB, PostgreSQL, Oracle, and Microsoft SQL Server.

Therefore, when migrating to the cloud, most applications that use any of these database engines can be deployed so that they use Amazon RDS instead of local database servers without too much effort. In addition, Amazon RDS also supports Amazon's database platform, Amazon Aurora, a MySQL and PostgreSQL compatible relational database.

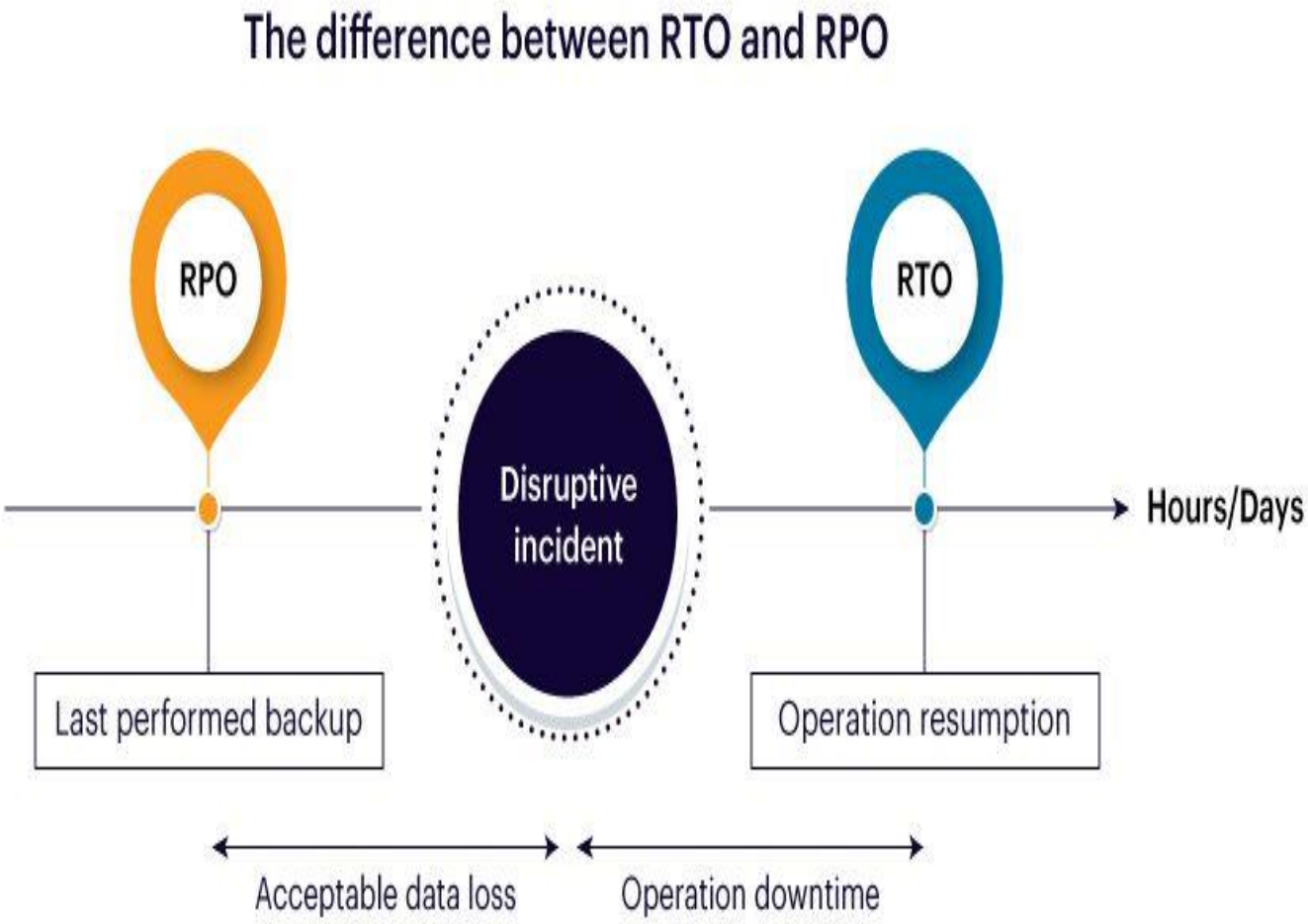
For each engine, you can choose different database instance types depending on the CPU, memory, storage, and networking requirements. With Amazon RDS, you offload time-consuming database administration tasks such as provisioning, setup, patching, backup, recovery, failure detection, and repair to Amazon, thus freeing your team from worrying about these laborious and error-prone tasks.



- Amazon RDS automatically backs up your databases every 24 hours by default. This feature ensures that, in the worst case, your RTO is 24 hours. With a multi-region (multi-site) active-active multi-region strategy, the RPO is near zero, and RTO could be potentially nil.
- Routine patching is automated as well, with set maintenance windows to keep your database instances secure.

- With RDS, you can also have read replicas in zones closer to your users. In order to increase read capacity and free up IOPS, you could route read queries from your applications to the read replica.

You can also send expensive queries to read replicas, thereby reducing the load on the production servers.



What is Amazon EC2?

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides secure access to server instances on demand. Obtaining and configuring capacity is easy – simply use the Amazon EC2 web service interface to add capacity on demand. You have complete control of your computing resources and can scale up or down as your needs change. To provide database services required for your application, you can provision EC2 instances and install the required database engine(s) yourself on the instances.

Next, let us see the tradeoffs you have to make when choosing between Amazon RDS and EC2 for your database instances.

https://www.eginnovations.com/blog/how-to-choose-between-aws-rds-and-ec2-hosted-database/