



# Running Highly Available MariaDB with Amazon RDS

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# **“Everything fails, all the time.”**

**Werner Vogels**  
CTO, Amazon.com



# Amazon RDS

Managed relational database service with a choice of seven popular database engines



## Easy to administer



Easily deploy and maintain hardware, OS and DB software; built-in monitoring

## Secure & compliant



Data encryption at rest and in transit; industry compliance and assurance programs

## Available & durable



Automatic Multi-AZ data replication; automated backup, snapshots, failover

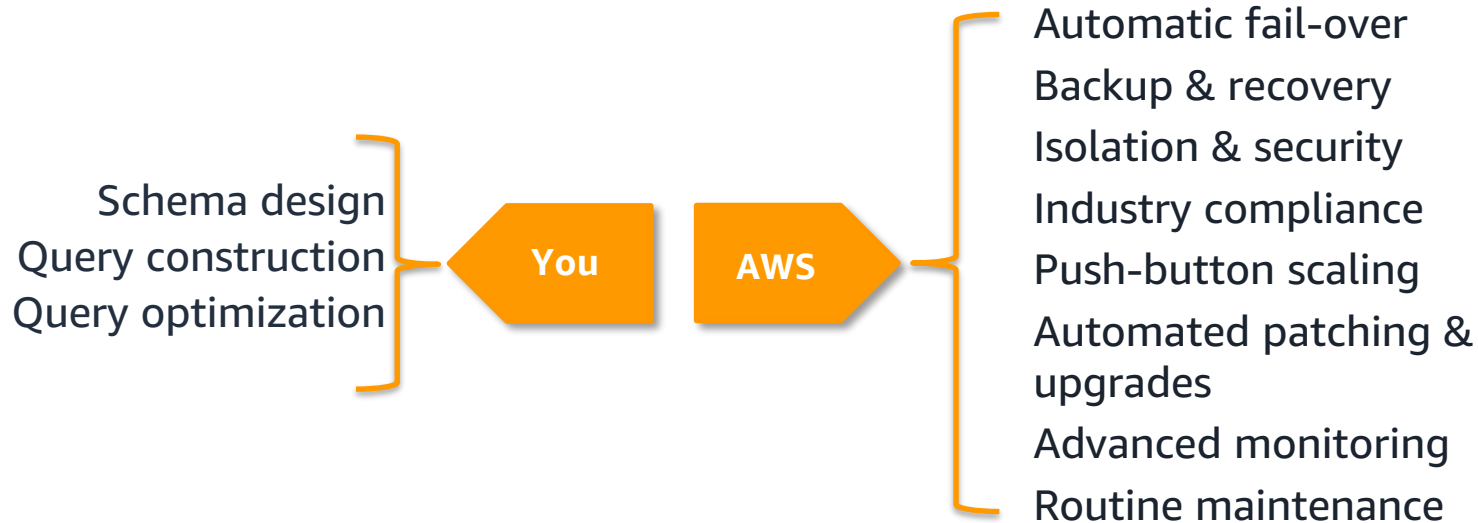
## Performant & scalable



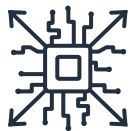
Scale compute and storage with a few clicks; minimal downtime for your application

# Amazon RDS - fully managed

Spend time innovating & building new apps, not managing infrastructure



# Scale compute and storage with ease



Scale compute to handle increased load

- Up to 128 vCPU and 4096 GiB of RAM



Scale storage for larger data sets

- Quickly scale EBS storage up to 64TiB
- No downtime for storage scaling

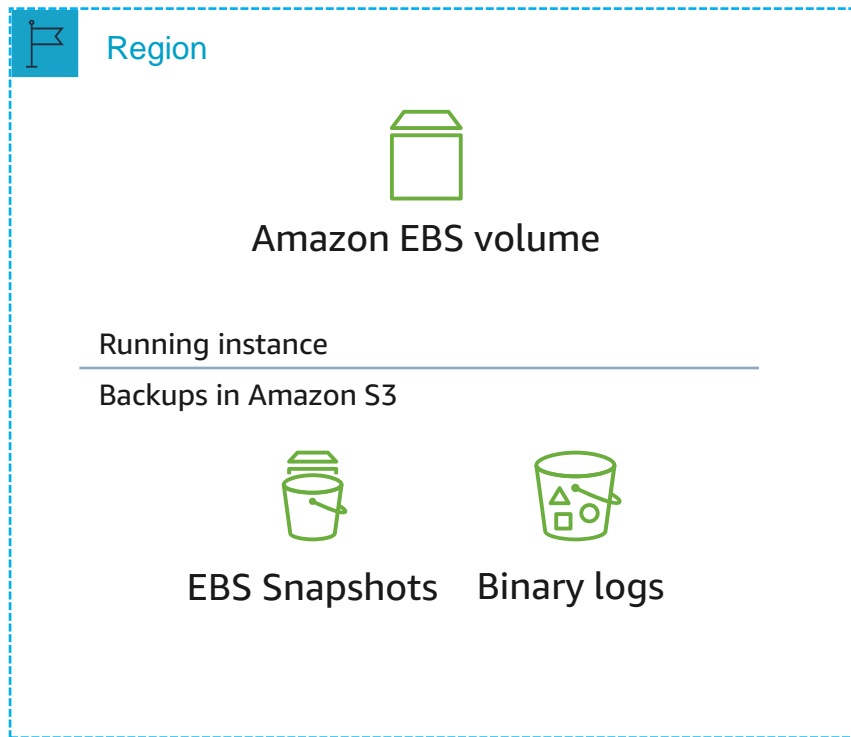


Scale down to control costs

- As little as 1vCPU / 1 GiB of RAM

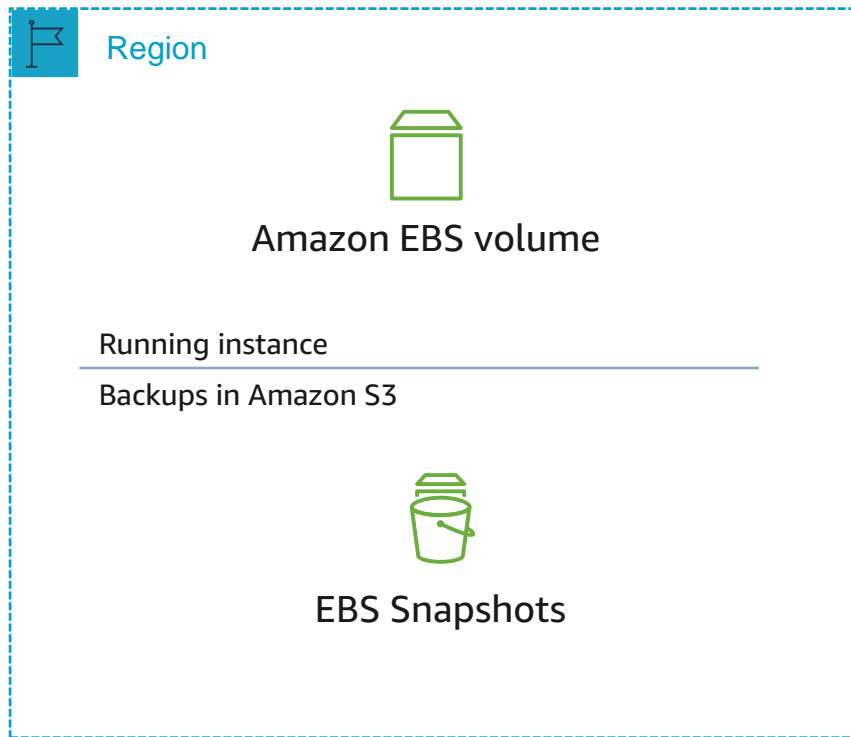
# RDS automated backups

- Enabled by default
- Daily snapshot of storage volumes
- Binary logs swept to Amazon S3 every 5 minutes
- Managed retention up to 35 days (default 7 days)
- Cross-Region Automated Backups for DR



# RDS manual backups

- Request a snapshot at any time
- Copy automated (system) snapshots to manual
- Retained until you delete them



# Monitoring RDS databases



**Instance**

## Amazon CloudWatch

- CPU/ Memory / IOPS / Network
- Per minute metric storage in Amazon CloudWatch



**Operating System**

## Amazon RDS Enhanced Monitoring

- Process / Thread list
- Per second metric storage in Amazon CloudWatch Logs



**Database Engine**

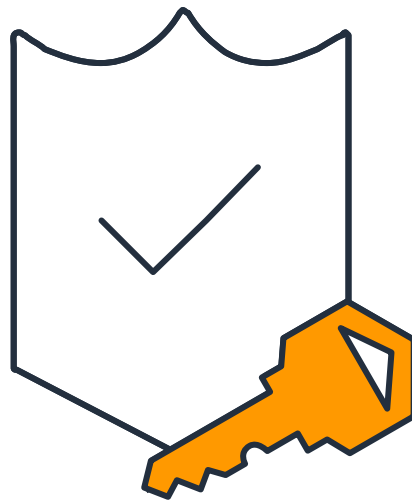
## Amazon RDS Performance Insights

- SQL / State / User / Host ("Database Load")
- Per second metric storage in Amazon RDS



# Security and compliance

- Network security
  - Amazon Virtual Private Cloud (VPC) security groups act as a virtual firewall to control inbound and outbound traffic
- Resource access permissions
  - Using Database user and permissions
- Data encryption
  - Encryption at rest using AWS KMS
  - SSL protection for data in transit
- Compliance and assurance programs for finance, healthcare, government, and more
  - HIPAA eligibility under a Business Associate Agreement (BAA) with AWS

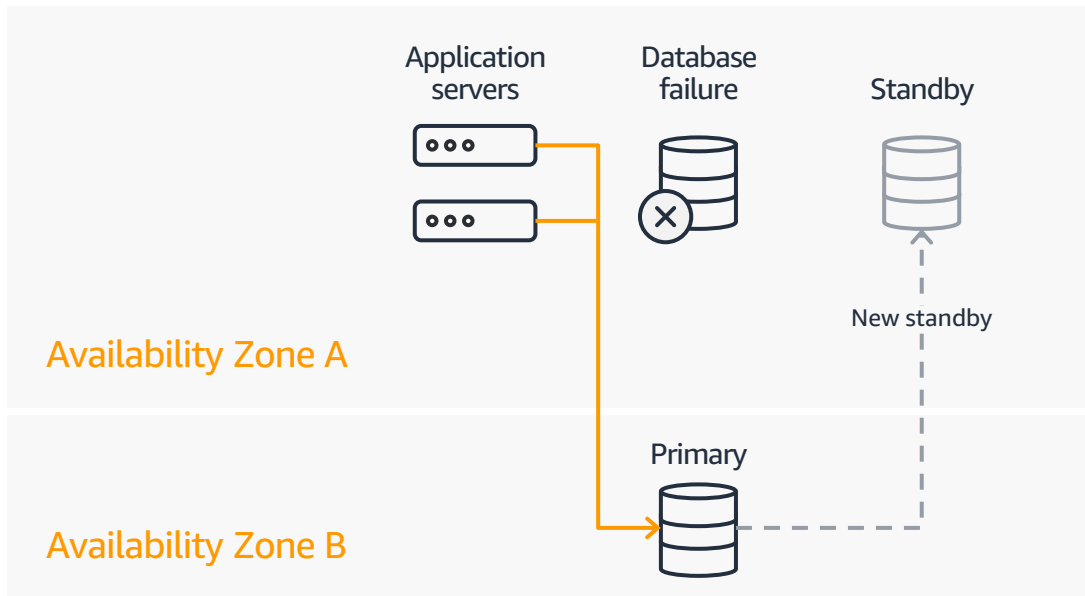


# Multi-AZ deployments

## Enterprise-grade high availability

Fault tolerance across multiple data centers

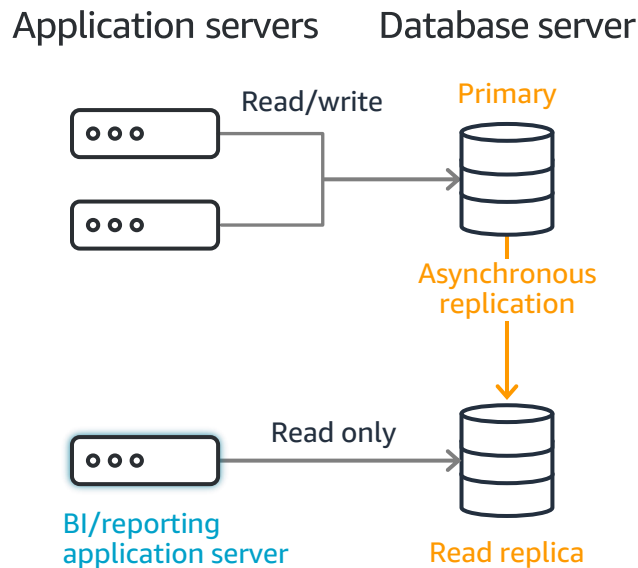
- Automatic failover
- Synchronous replication
- Enabled with one click



# Read scaling using Read Replicas

## Read scaling and disaster recovery

- Relieve pressure on your primary node with additional read capacity
- Bring data close to your applications in different regions
- Promote a read replica to a primary for faster recovery in the event of disaster
- RDS for MariaDB now support 15 read replicas per instance, including up to 5 cross region read replicas.



# Amazon RDS HA/DR features

Feature	RPO (approximate)	RTO (approximate)
Multi-AZ for high availability	0	1 to 2 minutes
Automated Snapshot restore	Hours	<1 hour
Manual Snapshot restore	Depends on the time of snapshot	< 1 hour
Point-in-time restore	5 Minutes	<1 to several hours
RDS Read replicas (in-region)	Depends on the replication lag	<5 minutes
RDS Read replicas (cross-region)	Depends on the replication lag	<5 minutes
External replicas	Depends on the replication lag	Minutes to hours



# Thank you!

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