



# INNOVATE

ONLINE CONFERENCE

# Managing relational databases on AWS

Blair Layton  
Business Development, Database, AWS

# Agenda

Why managed databases

Amazon Relational Database Service (Amazon RDS) overview

Sizing an Amazon RDS instance

Scaling an Amazon RDS instance

Backup and recovery

Upgrades and patching

Deleting an Amazon RDS instance

# Why managed databases?

**How much time do your DBAs and other IT staff spend on:**

Provisioning hardware and storage?

Installing, upgrading, and patching software?

Documentation, licensing, and training?

Backup & recovery, and data load & unload?

Security?

# If you host your databases on premises

App optimization

Scaling

High availability

Database backups

DB s/w patches

DB s/w installs

OS patches

OS installation

Server maintenance

Rack & stack

Power, HVAC, net

# If you host your databases in Amazon EC2

App optimization

Scaling

High availability

Database backups

DB s/w patches

DB s/w installs

OS patches

OS installation

Server maintenance

Rack & stack

Power, HVAC, net





# If you choose a managed DB service like Amazon RDS

App optimization

Scaling

High availability

Database backups

DB s/w patches

DB s/w installs

OS patches

OS installation

Server maintenance

Rack & stack

Power, HVAC, net



Amazon RDS





Amazon  
RDS

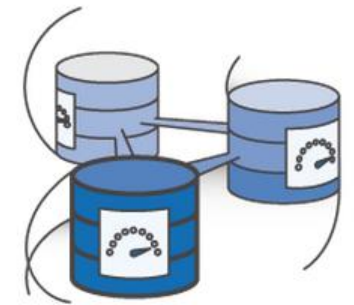
Relational databases

Managed service

Simple and fast to scale

Fast, predictable performance

Low cost, pay for what you use



Amazon Aurora



# Sizing an Amazon RDS instance

# Servers are now instances

Amazon RDS instances consist of the following characteristics:

- vCPUs: Hyper-threads on Intel CPUs with 1 – 128 vCPUs
- RAM: 1 GiB – 3,904 GiB
- Network throughput: Up to 25,000 Mbps
- Amazon EBS dedicated network throughput: Up to 14,000 Mbps
- Allocated Amazon EBS storage: Up to 64 TB and 80,000 IOPS
- Amazon Aurora uses a separate storage service with up to 64 TB

# Amazon EBS volume types for Amazon RDS: Summary

	General Purpose (SSD)	Provisioned IOPS (SSD)
Recommended use cases	Boot volumes Small to medium DBs Dev and test	I/O-intensive workloads Large DBs
Storage media	SSD-backed	SSD-backed
Volume size	1 GiB - 16 TiB	4 GiB - 16 TiB
Max IOPS per volume	16,000 IOPS	32,000 IOPS/64,000 IOPS (Nitro)
Burst	< 1 TB to 3000 IOPS	Baseline
Read and write peak throughput	250 MB/s	500 MiB/s / 1,000MiB/s (Nitro)
Max IOPS per instance (16k)	80,000	80,000
Peak throughput per instance	1,750MB/s	1,750MB/s
Latency (random read)	1-2 ms	1-2 ms
API name	gp2	io1
Price*	\$0.115/GB-month	\$0.125/GB-month \$0.10/provisioned IOPS

\* Varies by region

# Choose your instance wisely

Balance the vCPUs, RAM, network, and storage

Use your existing database metrics to guide sizing on AWS

Instance Type	vCPU	Memory (GiB)	PIOPS-Optimized	Network Performance
Standard - Latest Generation				
db.m4.large	2	8	Yes	Moderate
db.m4.xlarge	4	16	Yes	High
db.m4.2xlarge	8	32	Yes	High
db.m4.4xlarge	16	64	Yes	High
db.m4.10xlarge	40	160	Yes	10 Gigabit

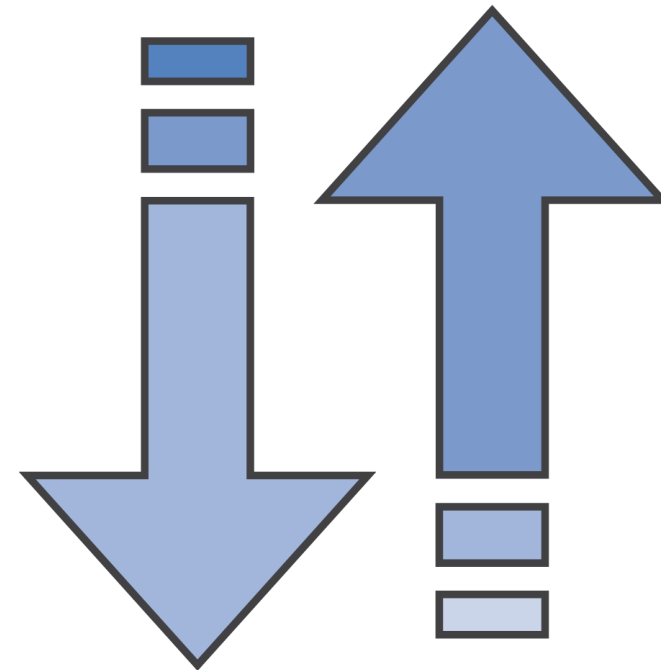
# Demo: Launching an Amazon RDS instance

# Scaling an Amazon RDS instance



# Scaling up—or down

- Manage changes in workload demands
- Control costs

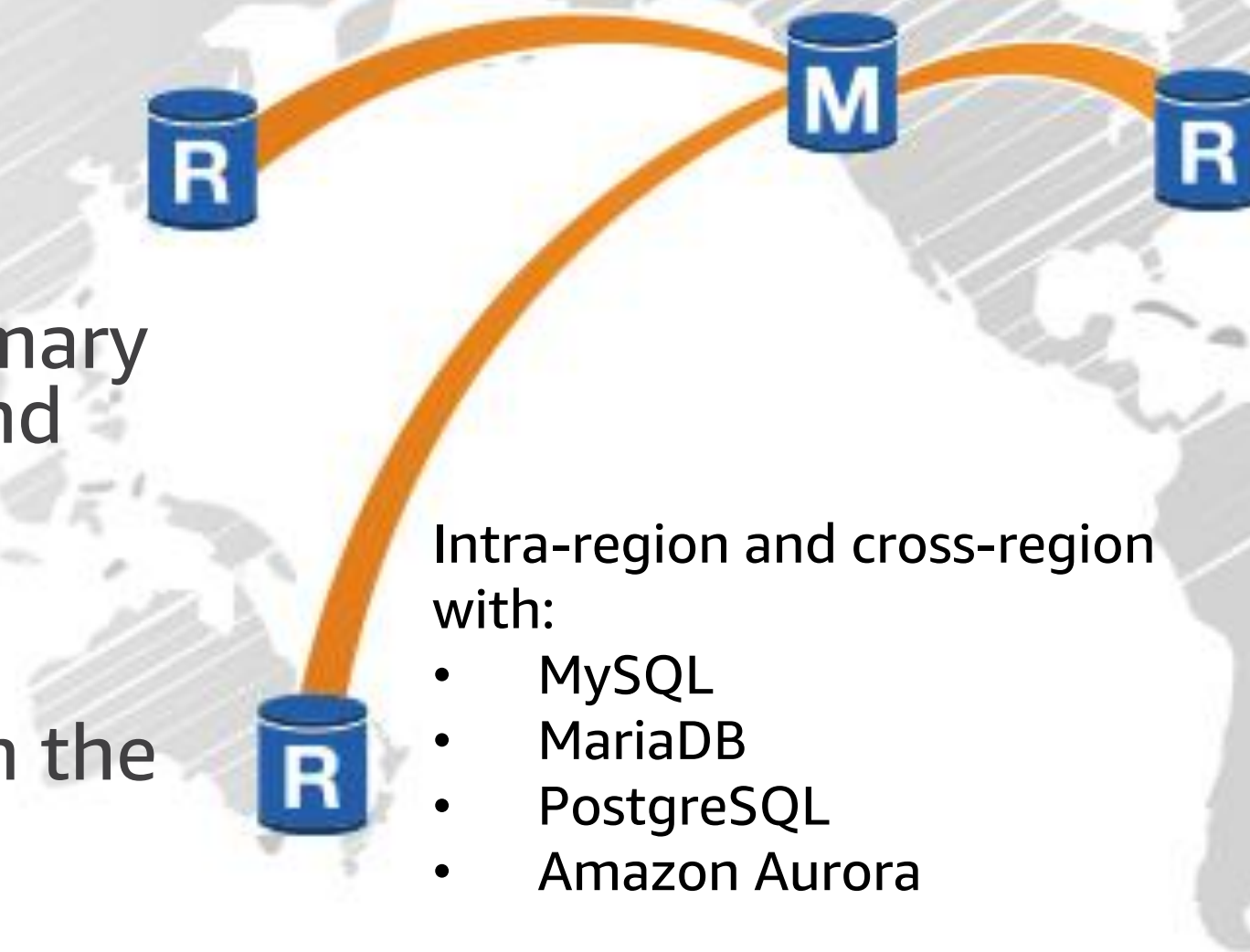


# Scaling reads with read replicas

Bring data close to your customers' applications in different regions

Relieve pressure on your primary node for supporting reads and writes

Promote a read replica to a primary for faster recovery in the event of disaster



Intra-region and cross-region with:

- MySQL
- MariaDB
- PostgreSQL
- Amazon Aurora

# Read replicas: Oracle Database and SQL Server

## Options

- Oracle GoldenGate
- AWS Database Migration Service
- Third-party replication products
- Snapshots

The Oracle logo, featuring the word "ORACLE" in a bold, red, sans-serif font with a registered trademark symbol.

# Demo: Scaling an Amazon RDS instance

# Backup and recovery

# Automatic backups

## MySQL, PostgreSQL, MariaDB, Oracle, SQL Server

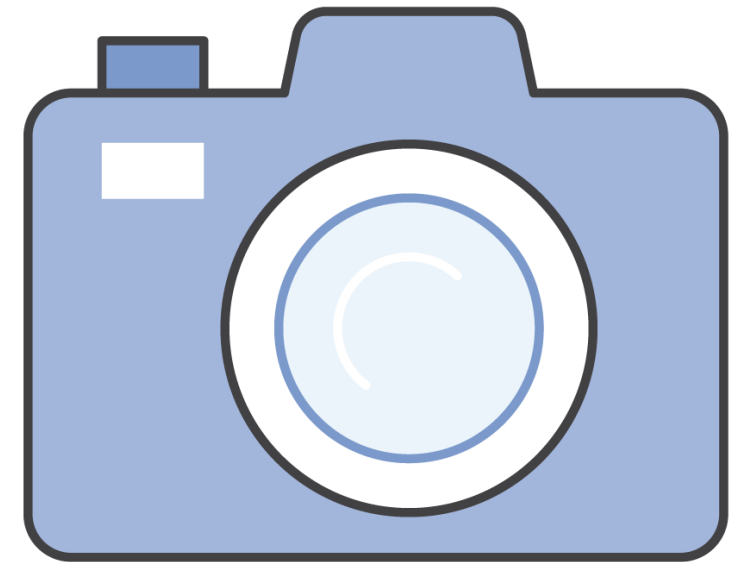
- Scheduled daily backup of entire instance using incremental snapshots
- Archive database change logs every 5 minutes
- 35-day retention for backups
- Stored in Amazon S3 so you can restore to any Availability Zone





# User snapshots

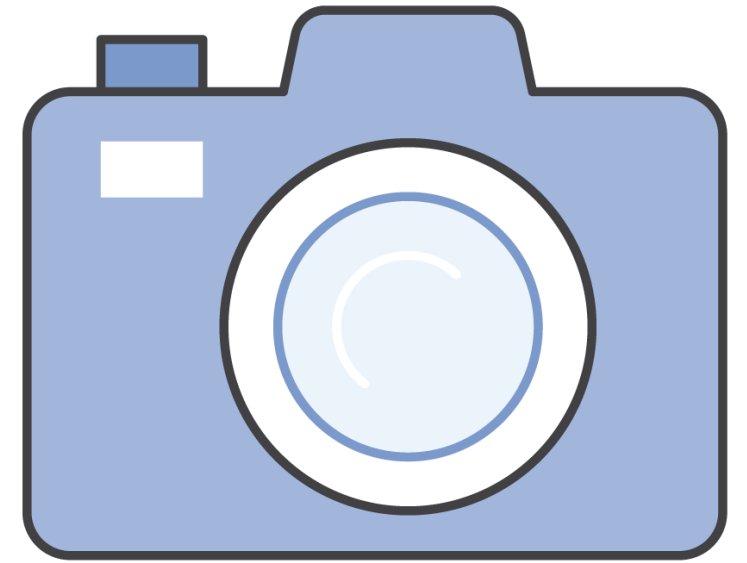
- Full copies of your Amazon RDS database that are different from your scheduled backups
- Backed by Amazon S3
- Used to create a new Amazon RDS instance
- Remain encrypted if using encryption



# Snapshots

## Use cases

- Resolve production issues
- Non-production environments
- Point-in-time restore
- Final copy before terminating a database
- Disaster recovery
- Cross-region copy
- Copy between accounts



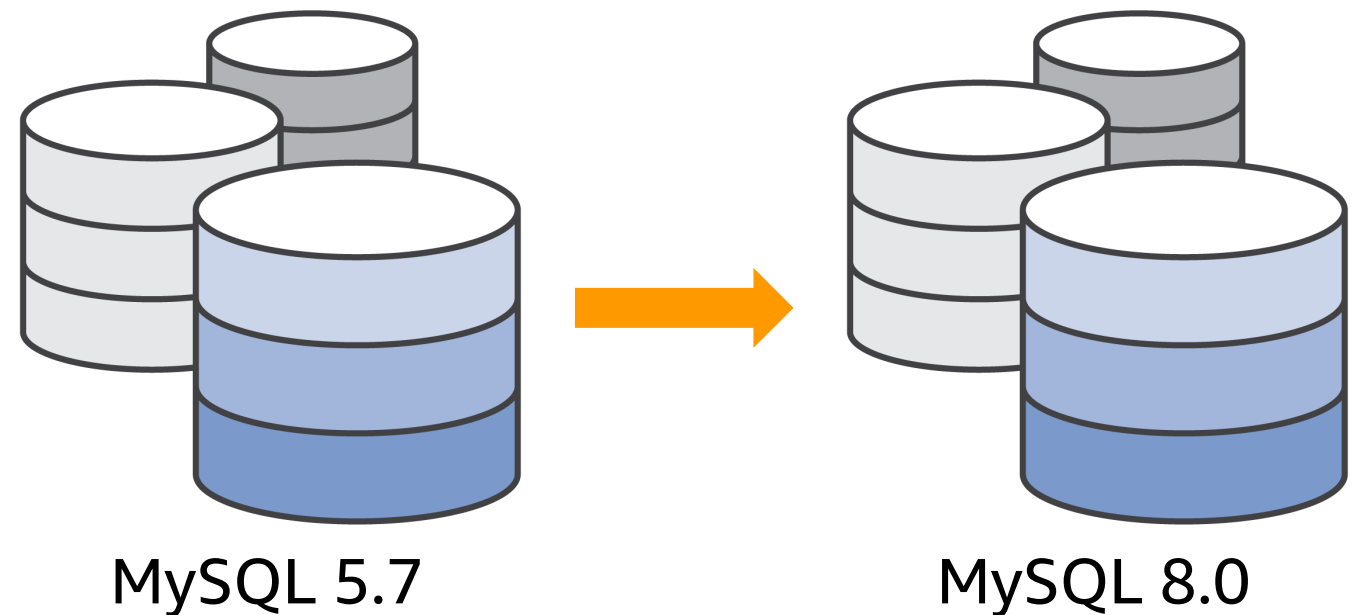
# Demo: Restoring an Amazon RDS instance

# Upgrades and patching

# Upgrades

Amazon RDS provides a fully managed upgrade process

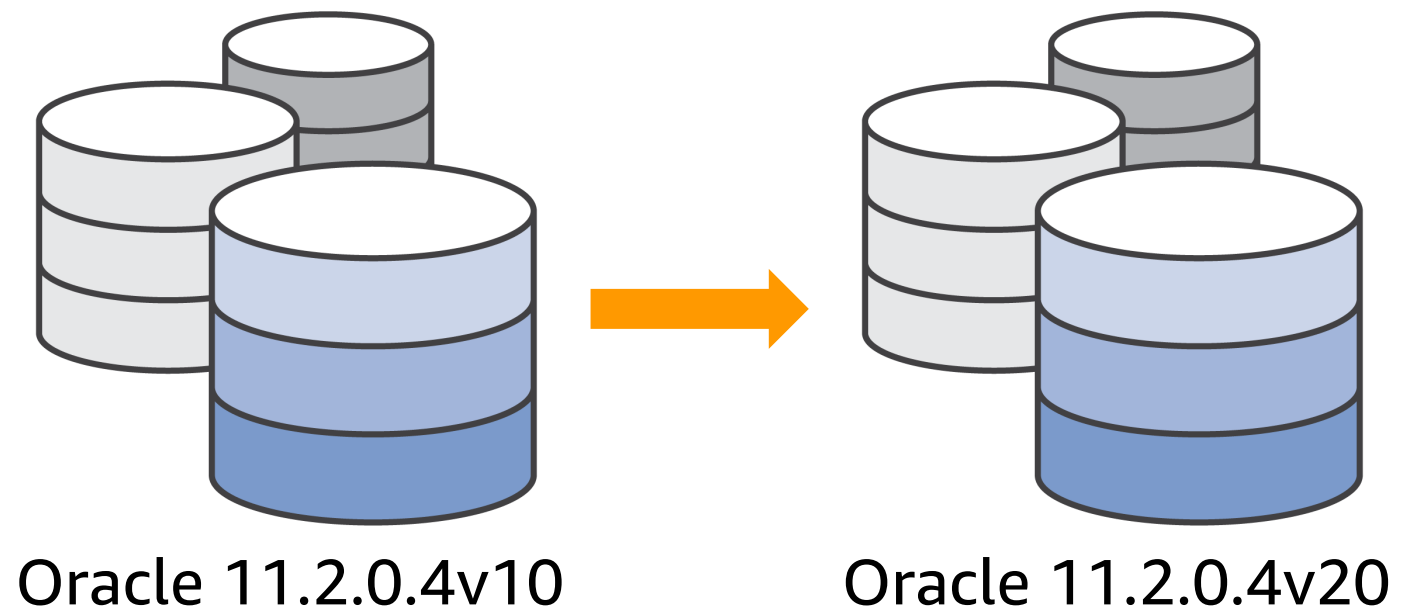
- Major version upgrade is user initiated
- Minor version upgrade can be user initiated or automatic
- Immediate or in the maintenance window
- Snapshots taken before an upgrade



# Patching

## Different engines have different policies

- Oracle PSUs and SQL Server service packs
- MySQL minor versions or 5.7.25a for security issues
- Amazon Aurora offers private patches and private versions
- Immediate or in the maintenance window
- Snapshots taken before a patch





# Demo: Upgrading an Amazon RDS instance

# Deleting an Amazon RDS instance

# Deleting an Amazon RDS instance

- Turn off delete protection!
- Process ensures you really want to delete the instance
- Take a final snapshot
- Instance will still appear while being deleted



# Demo: Deleting an Amazon RDS instance

# Summary

Why managed databases

Amazon Relational Database Service (Amazon RDS) overview

Sizing an Amazon RDS instance

Scaling an Amazon RDS instance

Backup and recovery

Upgrades and patching

Deleting an Amazon RDS instance

# Learn from AWS experts. Advance your skills and knowledge. Build your future in the AWS Cloud.



## Digital Training

Free, self-paced online courses built by AWS experts



## Classroom Training

Classes taught by accredited AWS instructors



## AWS Certification

Exams to validate expertise with an industry-recognized credential

Ready to begin building your cloud skills?  
Get started at: <https://www.aws.training/>



# Why work with an APN Partner?

**APN Partners** are uniquely positioned to help your organization at any stage of your cloud adoption journey, and they:

- Share your goals—focused on your success
- Help you take full advantage of all the business benefits that AWS has to offer
- Provide services and solutions to support any AWS use case across your full customer life cycle

## APN Partners with deep expertise in AWS services:



### **AWS Managed Service Provider (MSP) Partners**

APN Partners with cloud infrastructure and application migration expertise



### **AWS Competency Partners**

APN Partners with verified, vetted, and validated specialized offerings



### **AWS Service Delivery Partners**

APN Partners with a track record of delivering specific AWS services to customers

Find the right APN Partner for your needs: <https://aws.amazon.com/partners/find/>

# Thank you for attending AWS Innovate

We hope you found it interesting! A kind reminder to **complete the survey**.  
Let us know what you thought of today's event and how we can improve the event experience for you in the future.



[aws-apac-marketing@amazon.com](mailto:aws-apac-marketing@amazon.com)



[twitter.com/AWSCloud](https://twitter.com/AWSCloud)



[facebook.com/AmazonWebServices](https://facebook.com/AmazonWebServices)



[youtube.com/user/AmazonWebServices](https://youtube.com/user/AmazonWebServices)



[slideshare.net/AmazonWebServices](https://slideshare.net/AmazonWebServices)



[twitch.tv/aws](https://twitch.tv/aws)