What’s New in Amazon RDS for Open-Source and Commercial Databases

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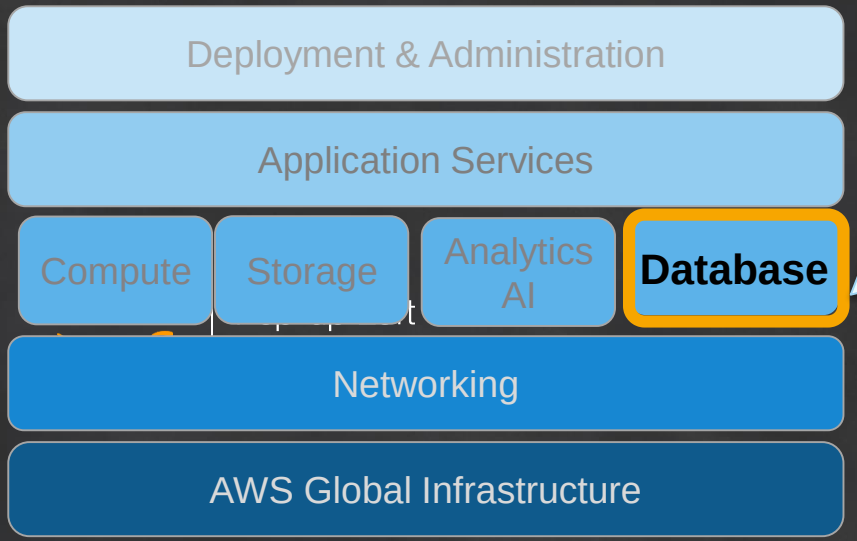
Principal Engineer
Amazon Aurora with PostgreSQL compatibility

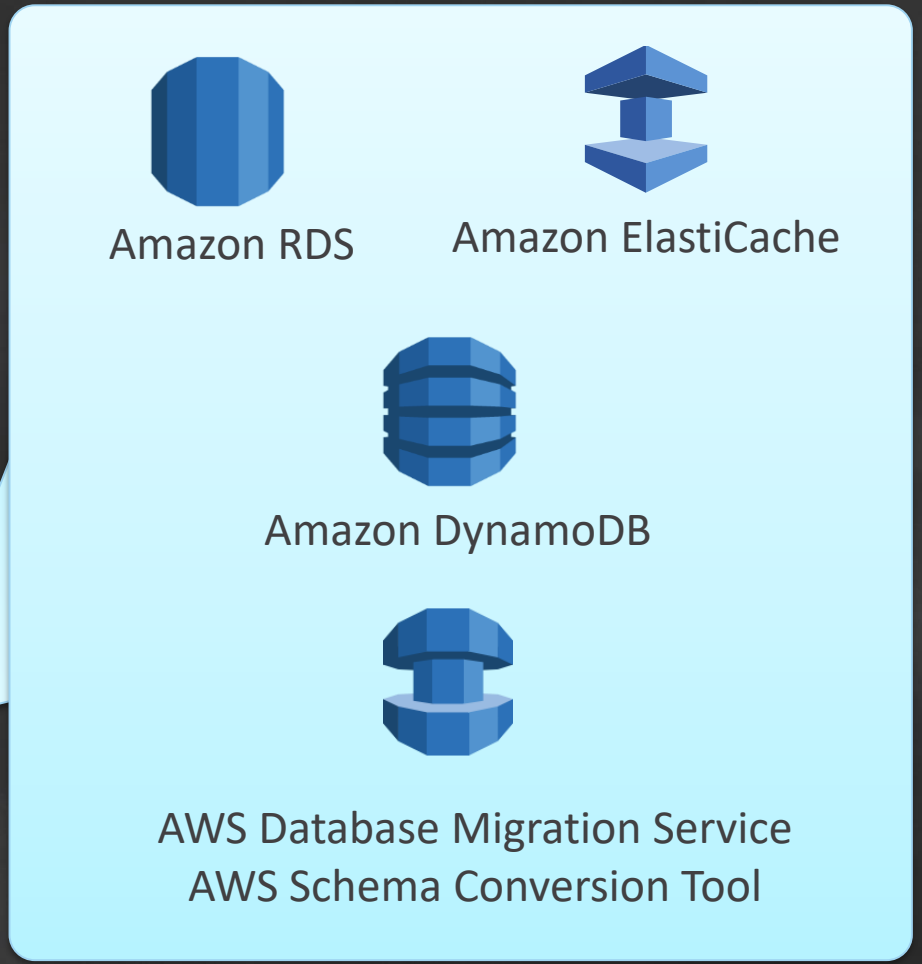
Pop-up Loft

Agenda

- Relational Database Services Overview
- RDS Features
- Open Source Engines Recent Launches
- Commercial Database Engines Recent Launches
- Q&A

AWS Database Services





RDS Managed Database Vision

- We make it easy to set up, operate, and scale relational databases in the cloud so customers can focus on application optimization.

- Higher bar on security, durability and availability than what's available on-premises or on EC2 or any other cloud provider.

- Customers can choose the database that is right for them:
  - ✓ Amazon Aurora, MySQL, MariaDB, PostgreSQL, Oracle, SQL Server.
  - ✓ Tiny databases on small CPUs to enterprise-class databases on enterprise hardware.

- We work to save our customers money through elasticity and operational efficiencies.

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Amazon RDS Engines

Commercial

ORACLE®

Microsoft® SQL Server

Open source

MySQL®

PostgreSQL

MariaDB

Cloud native

Amazon Aurora

MySQL Compatible
PostgreSQL Compatible

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Why use RDS for Microsoft and Oracle Databases?

- Speed of provisioning, Secure, Fully Managed RDS experience
- Single-click High Availability, Easy Scaling
- Broad set of Engine features supported
- Flexible Licensing models
  - BYOL (Bring-Your-Own-License)
  - LI (License Included)
- SQL Server Express, Web, Standard & Enterprise editions supported – 2014 and 2016
- Oracle Standard and Enterprise Editions

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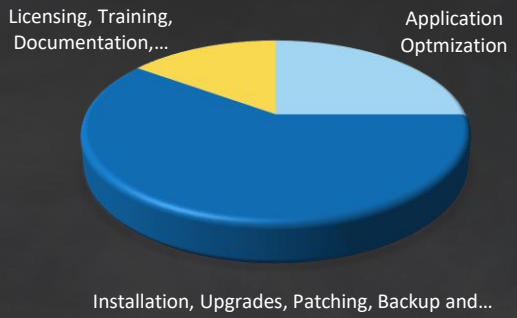
Relational Database Service (RDS)

Features

How is Database Practitioner time spent with RDS?



RDS takes care of your time-consuming database management tasks, freeing you to focus on your applications and business

App upgrades
Schema design
Query construction
Query optimization

DBA

AWS

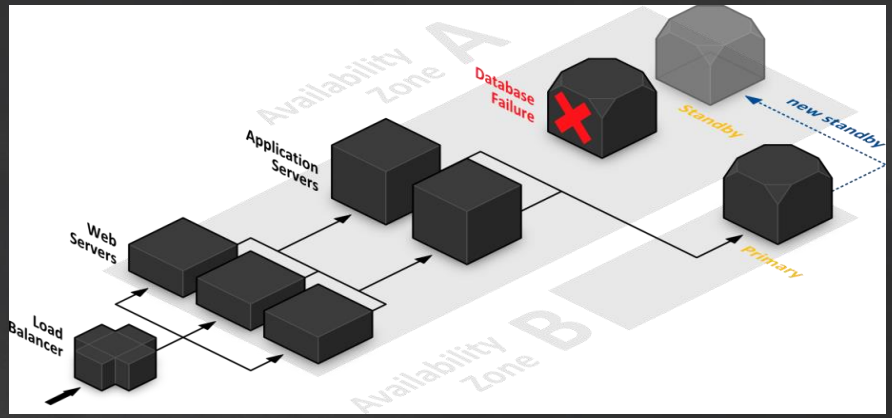
Automatic fail-over
Backup & recovery
Isolation & security
Industry compliance
Push-button scaling
Automated patching
Advanced monitoring
Routine maintenance

New Apps

Amazon RDS Key Features

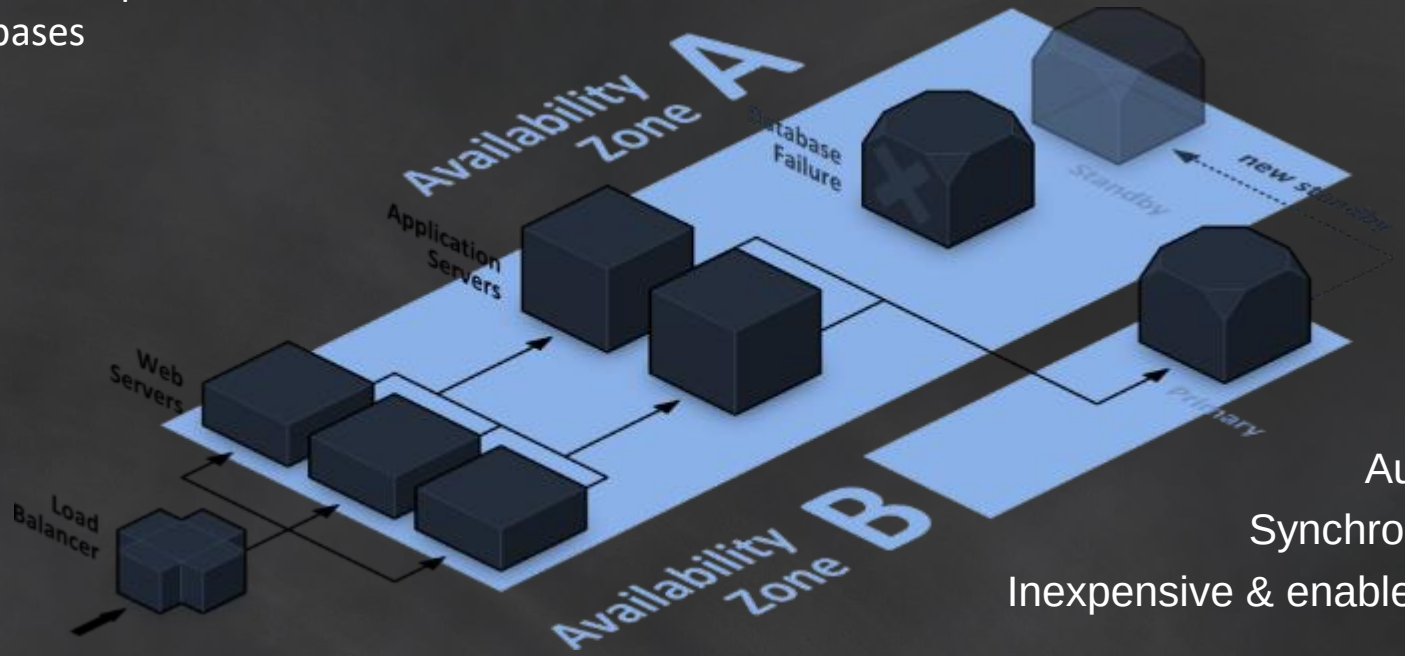
- Highly Available
- Durable, Point-In-Time-Recovery, Snapshots
- Scalable
  - Compute and Storage
- Secure & Compliant
  - Encryption in transit and at rest
  - TDE with Oracle and SQL Server
  - Compliance realms
- Integration across AWS

- ... and a lot more



High Availability Multi-AZ Deployments

Enterprise-grade fault tolerance solution for production databases



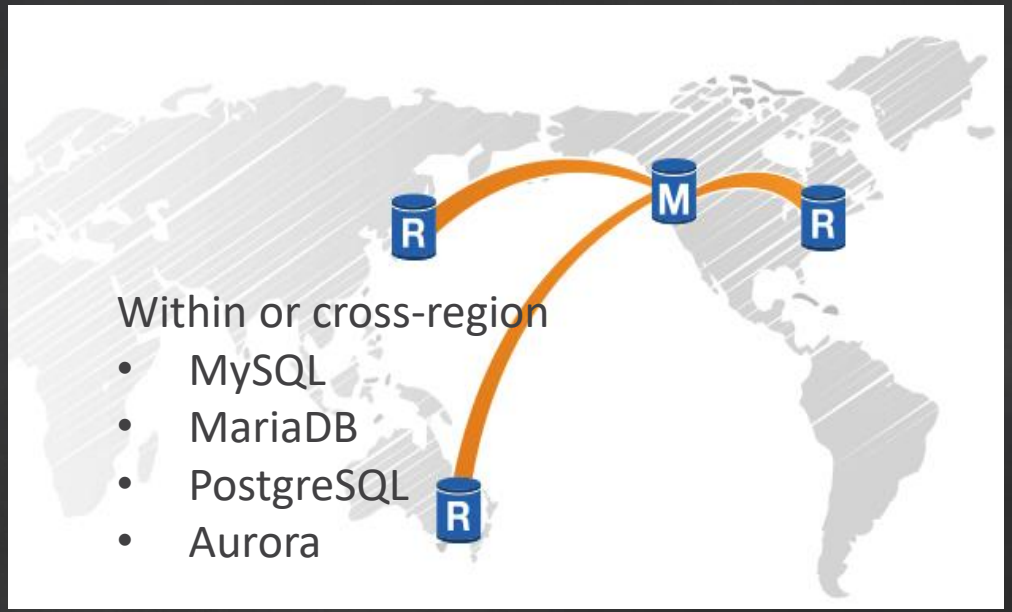
Automatic failover

Synchronous replication

Inexpensive & enabled with one click

Cross Region Read Replicas

- Bring data close to your customer's applications in different regions
- Relieve pressure on your master node for supporting reads and writes
- Promote a Read Replica to a master for faster recovery in the event of disaster



Automated Backups

- MySQL, PostgreSQL, MariaDB, Oracle, SQL Server
  - Scheduled daily volume backup of entire instance
  - Archive database change logs
  - Maximum 35-day retention
  - Taken from standby when running Multi-AZ
- Aurora
  - Automatic, continuous, incremental backups
  - No impact on database performance
  - 35-day retention

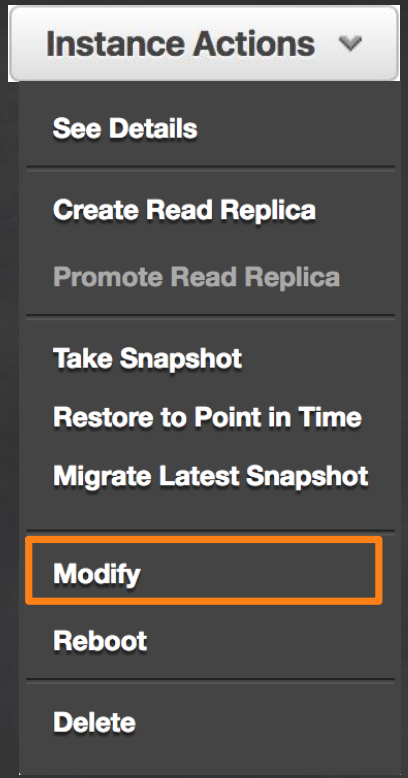
Availability and Durability	
DB Instance Status	available
Multi AZ	Yes
Automated Backups	Enabled (7 Days)
Latest Restore Time	October 12, 2016 at 4:50:00 PM UTC-7

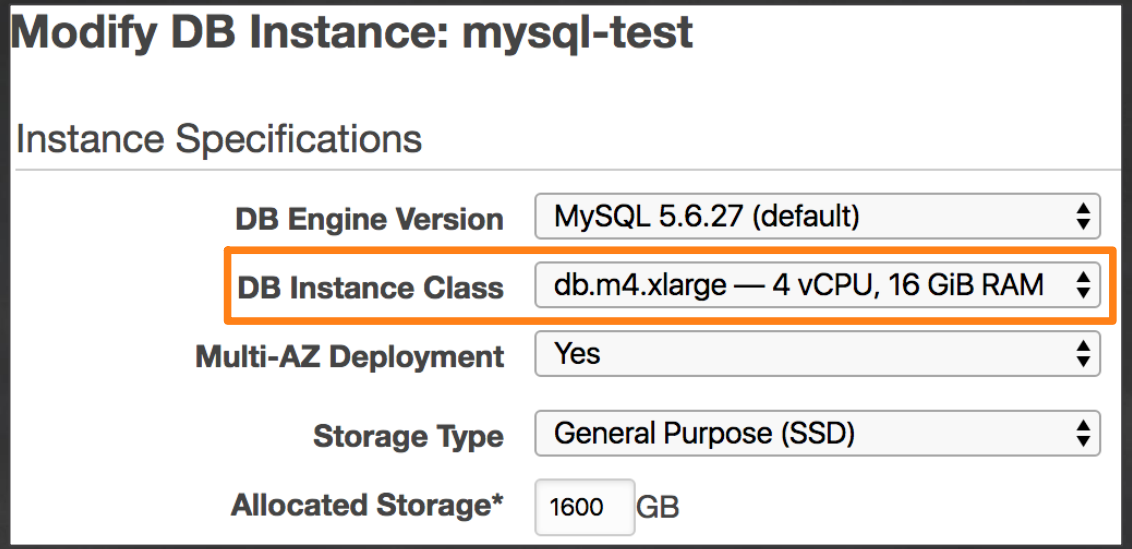
Every day during your backup window, the RDS service creates a storage volume snapshot of your database

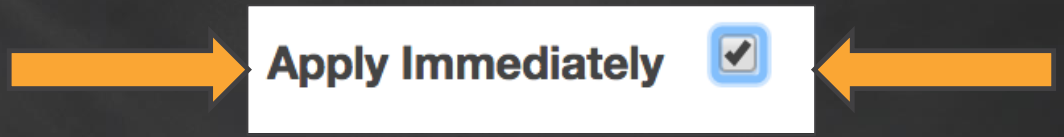
Every five minutes, RDS backs up the transaction logs of your database

Scaling Instances Up/Down

AWS Management Console







Compliance

Compliance Details

Aurora

- SOC 1, 2, 3
- ISO 20001/9001
- ISO 27107/27018
- PCI
- HIPAA BAA

MySQL

- SOC 1, 2, 3
- ISO 20001/9001
- ISO 27107/27018
- PCI
- FedRamp
- HIPAA BAA
- UK Gov. Programs
- Singapore MTCS

Oracle

- SOC 1, 2, 3
- ISO 20001/9001
- ISO 27107/27018
- PCI
- FedRamp
- HIPAA BAA
- UK Gov. Programs
- Singapore MTCS

PostgreSQL

- SOC 1, 2, 3
- ISO 20001/9001
- ISO 27107/27018
- PCI
- UK Gov. Programs
- Singapore MTCS
- HIPAA BAA

MariaDB

- SOC 1, 2, 3
- ISO 20001/9001
- ISO 27107/27018
- PCI
- HIPAA BAA

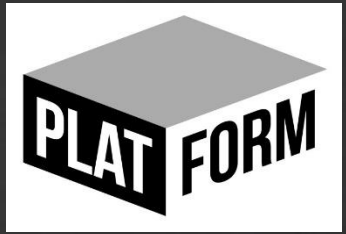
SQL Server

- SOC 1, 2, 3
- ISO 20001/9001
- ISO 27107/27018
- PCI
- HIPAA BAA
- UK Gov. Programs
- Singapore MTCS

Recently Announced RDS Features and Services

Pop-up Loft

New RDS Platform Features



- Instance Stop/Start
  - Supports a way to hibernate or awaken a database in minutes
- New instance types
- Reserved Instance Flexibility
  - Discounts on long-term contracts can be applied when changing instance types

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Announcing General Availability of Amazon Aurora with PostgreSQL compatibility!

PostgreSQL 9.6 + Amazon Aurora cloud-optimized storage

- Performance: Up to 2x+ better performance than PostgreSQL alone
- Availability: failover time of < 30 seconds
- Durability: 6 copies across 3 Availability Zones
- Read Replicas: single-digit millisecond lag times on up to 15 replicas

Fully compatible with PostgreSQL, now and for the foreseeable future

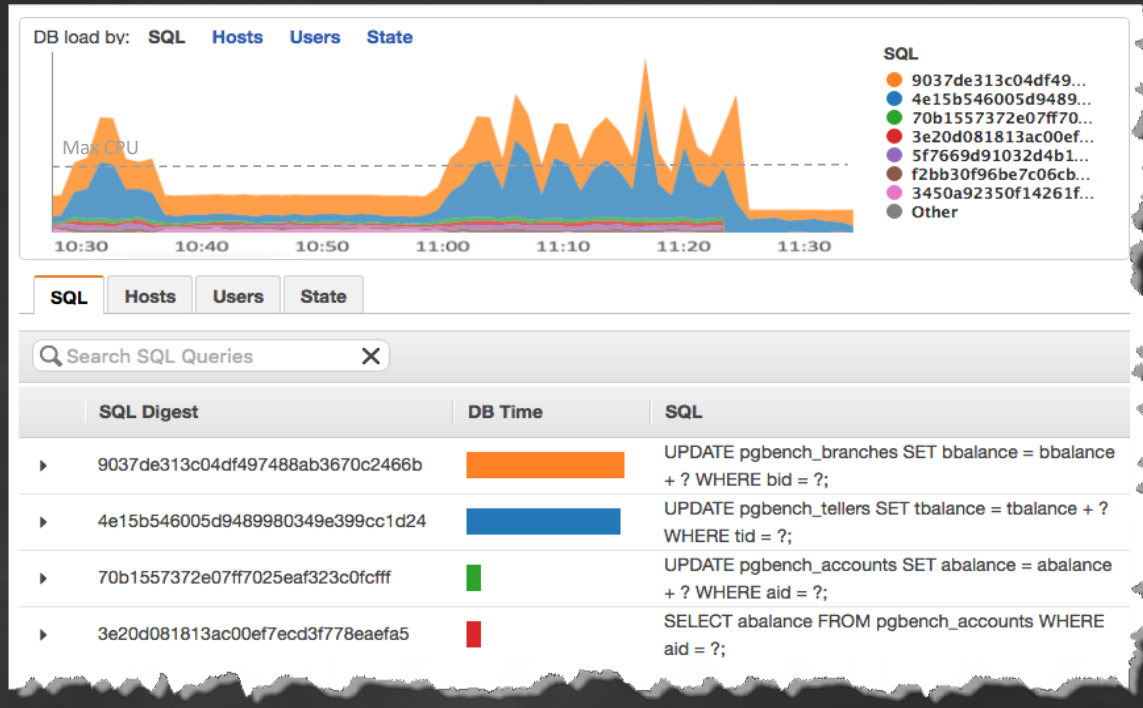
- Not a compatibility layer – native PostgreSQL implementation

Amazon Aurora with PostgreSQL Compatibility Performance By The Numbers

Measurement	Result
PgBench	Up to 2.9x faster
Sysbench	2x-5x faster
Vacuum	Time reduced up to 86%
Response time	>2x lower, 99% < variance
Throughput jitter	3x more consistent
Throughput at scale	4x faster
Recovery speed	Time reduced up to 97%

RDS Performance Insights in Open Preview

- Database Load : Identifies bottlenecks
  - Easy
  - Powerful
- Identifies source of bottlenecks
  - Top SQL
- Adjustable Time frame
  - Hour, day, week and longer



New RDS Open Source Database Features

- **PostgreSQL**
  - S3 integration
  - RDS for PostgreSQL to Aurora PostgreSQL
  - PostgreSQL 10.0
  - Hugepages support in RDS PostgreSQL
  - auto_explain (thrown explain plans for slow queries automatically in logs)
  - wal2json (Write your own custom logical replication event processor with this plugin)

- **MySQL / MariaDB**
  - HIPAA Eligibility

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New RDS for Oracle Features

- Spatial/Locator
- Oracle Multimedia
- Support for Multiple APEX versions
- New Instance Types
  - r4 (memory-optimized, for high-performance, latency-sensitive workloads)
  - db.t2.xlarge, db.t2.2xlarge (t2 for low-cost burstable CPU performance, for dev/test workloads)
  - db.m4.16xlarge (balance of compute, memory, and network resources. 256GiB RAM, 64 vCPU)
- Storage capacity increase
  - Up to 6TB when using the provisioned IOPS and General SSD storage types

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New RDS for SQL Server Features

- Support for Forced SSL
- HIPAA BAA Inclusion
- Larger Storage Capacity
  - 16 TB for General Purpose (SSD) storage
  - 16 TB for Provisioned IOPS storage
  - 1 TB for magnetic storage (all editions)
- Region Expansion for Enterprise Edition License Included

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Q&A