



19 August 2021

Architecting on AWS managed databases like a rockstar!

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Agenda

- Why AWS managed database services
- Flexible ways to move to AWS databases
- Migrating to AWS managed databases
- Architecting for critical Amazon Aurora databases
- Demo - Achieving High performance using Graviton2 Processors
- Conclusion

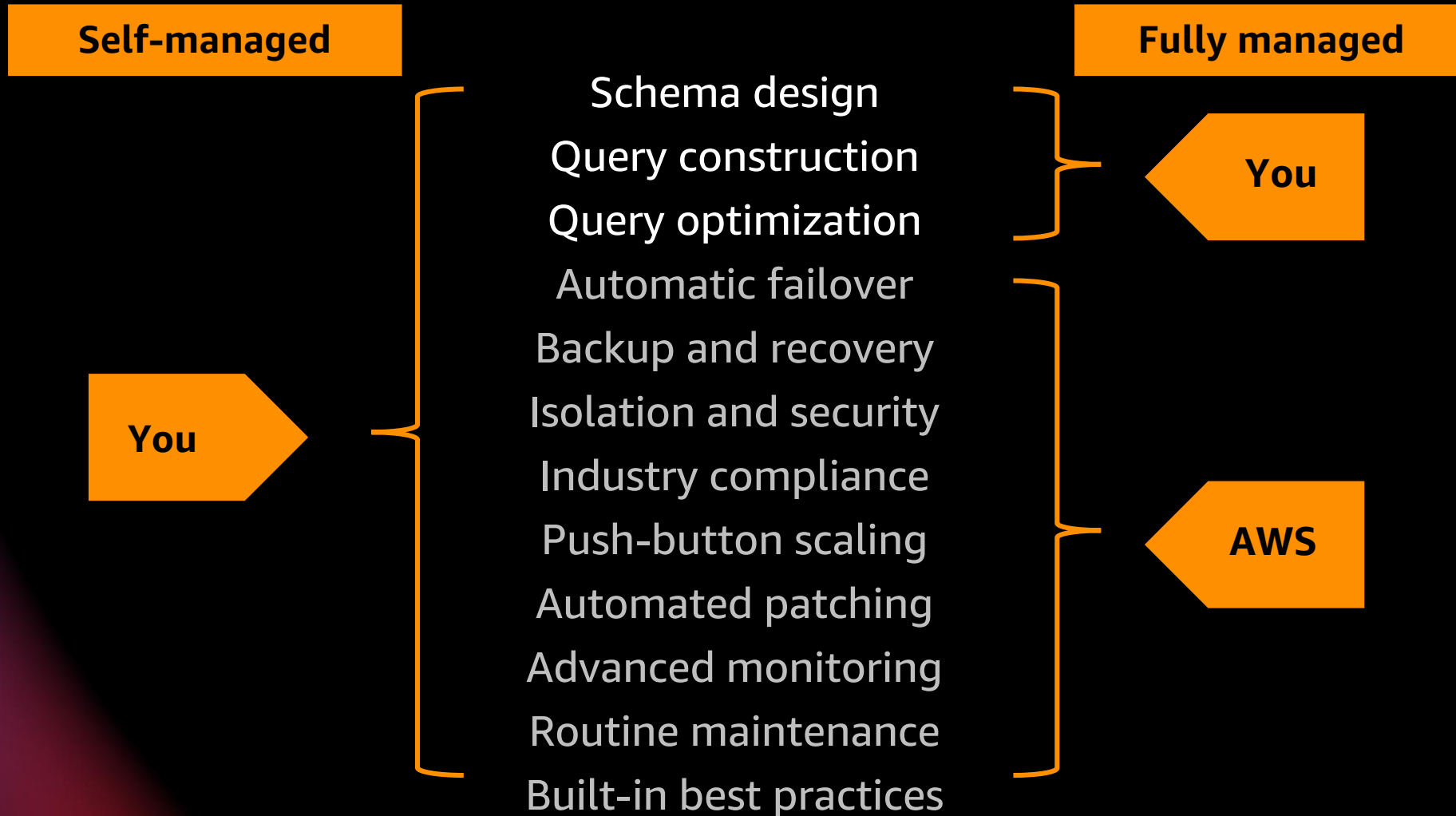
Why move to managed databases?

Self-managing databases services is time-consuming, complex, and expensive

- Hardware and software installation, configuration, patching, backups
- Performance and high-availability issues
- Capacity planning and scaling clusters for compute and storage
- Security and compliance

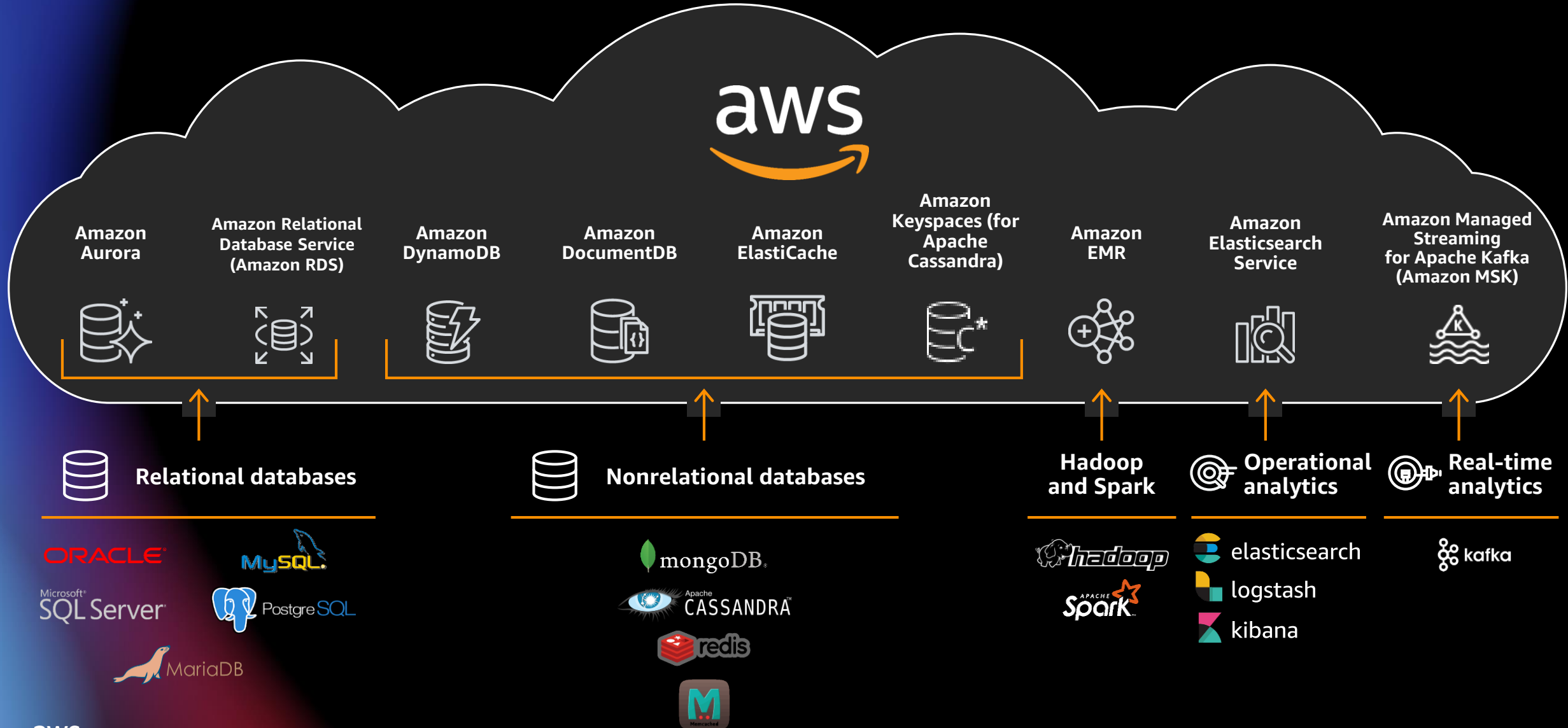
Fully managed services on AWS

Spend time innovating and building new applications, not managing infrastructure



Managed database services

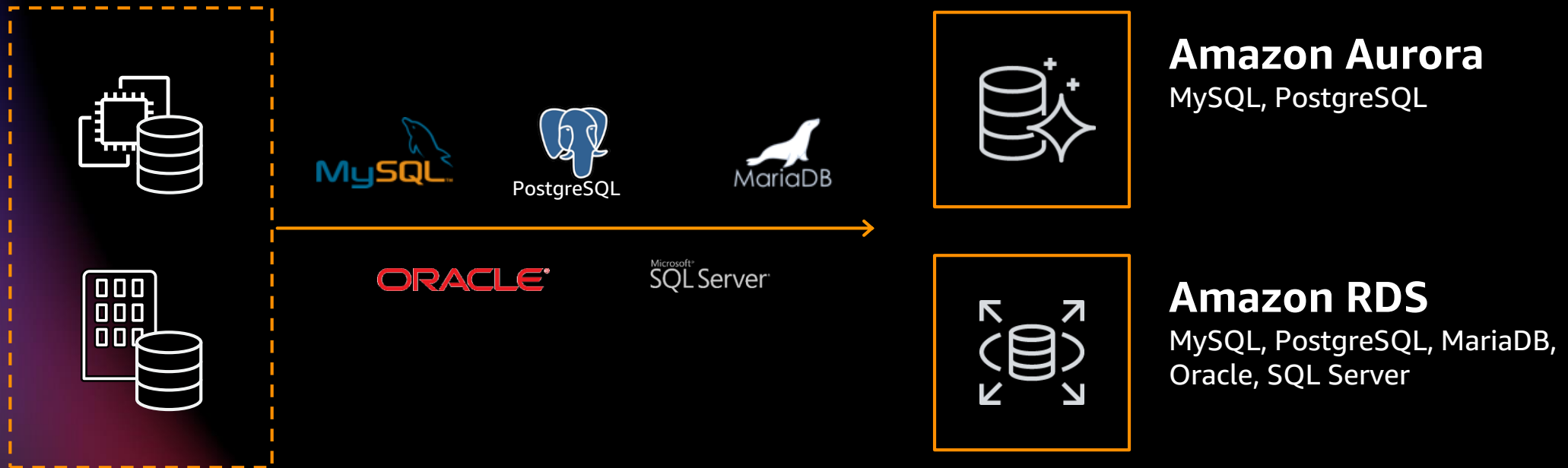
Fully managed database and analytics services



Move to managed relational databases

Migrate on-premises or self-managed relational databases to managed services

- Migrate without the need to rearchitect existing applications
- Reduce database administrative burden
- Get better performance, availability, scalability, and security



Flexible ways to migrate and modernize

One Step move to managed databases

- Most customers come to the cloud for immediate modernization and max benefit
- Some customers initially make homogenous migrations...
 - i.e. on-prem Oracle to Amazon RDS for Oracle or on-prem SQL Server to RDS SQL Server or on-prem MySQL to Aurora MySQL, etc.
- Whilst majority of the customers are looking to entirely reinvent their application for example moving from on-prem to Oracle to a collection of Aurora PostgreSQL + Amazon DynamoDB + Amazon ElastiCache on step 1

We offer flexible ways to help you migrate



**AWS Database
Migration
Service (AWS DMS)**



**AWS professional services
and migration partners**



**AWS Database
Freedom Program**

Migration tools

Migration tools

- **AWS Database Migration Service (AWS DMS)**

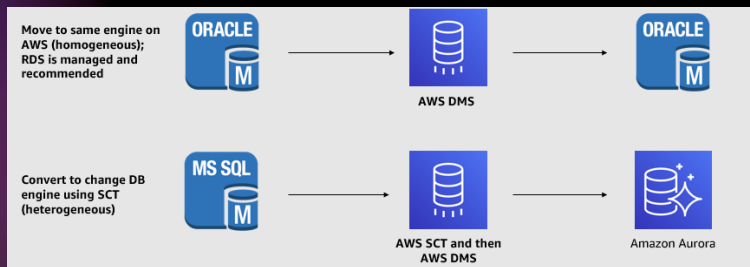
AWS DMS easily and securely migrates and/or replicate your databases and data warehouses to AWS

- **Schema Conversion Tool (AWS SCT)**

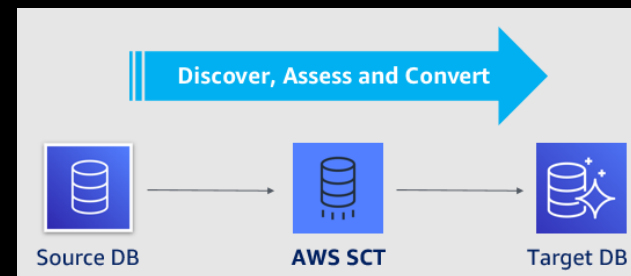
AWS SCT converts your commercial database and data warehouse schemas to open-source engines or AWS-native services, such as Amazon Aurora and Amazon Redshift

- **Database native tools**

Whilst AWS provided tools help you migrate databases to AWS quickly and securely with minimal setup required, customers may choose to use Database Native Tools like Postgres Pg_dump and Restore, SQL server native backup and restore mechanisms tc.



AWS DMS



AWS SCT

Globe Telecom migrates telco-grade workload from Oracle to AWS

Challenge

With Oracle, Globe Telecom was paying \$1M more (per three-year contract) than they would with AWS.

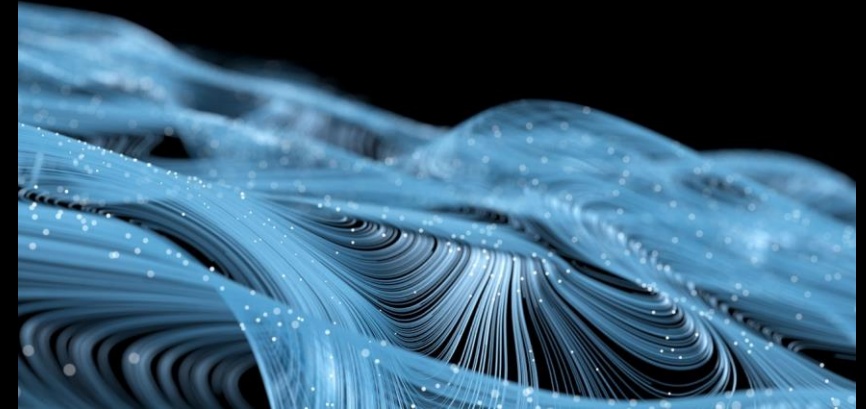
Solution

Globe chose Amazon Aurora PostgreSQL as their open-source database. Full migration was achieved in seven months with no interruptions to service quality.

Result

“The shift out of Oracle will save us an estimated \$1 million over the next three years in licensing fees—funds that Globe Telecom can use for new digital transformation projects. Performance has been solid—exceeding the latency target of 40 milliseconds.”

**—Melissa Banzon, Head of ISG Transformation Office,
Globe Telecom**



<https://aws.amazon.com/solutions/case-studies/globe-telecom-oracle-migration/>



Cloud-native DB migration design pattern- Amazon Aurora: Designing for higher availability & scalability

Challenges?

- How can I achieve maximum availability?
- How do I scale my read & write operations & design for future needs?
- How can I run my ETL without impacting my OLTP production system & keep costs low?

Amazon Aurora tolerates AZ+1 failures

Replicate 6 ways with 2 copies per AZ

Write quorum of 4/6

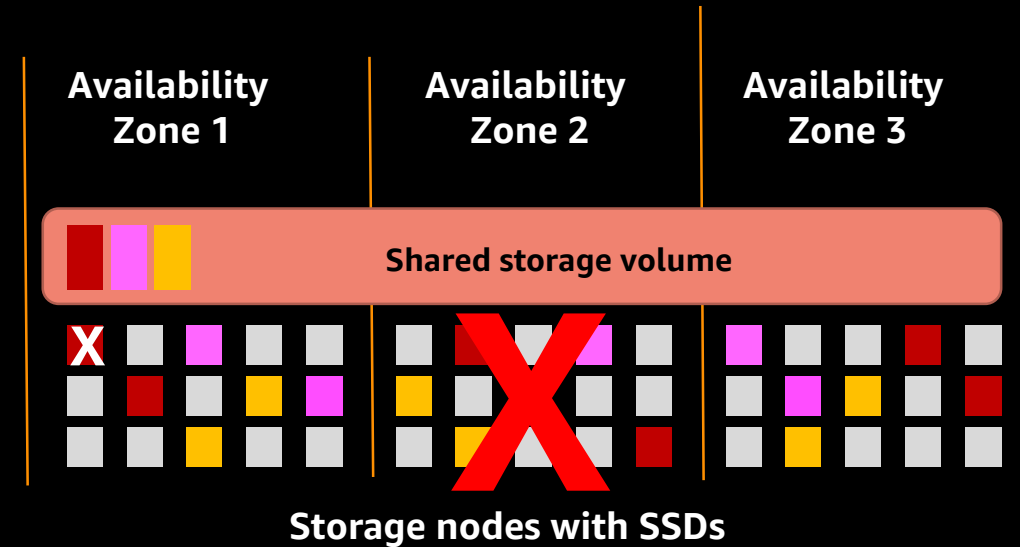
Read quorum of 3/6 (only for repair)

What if there is an AZ failure?

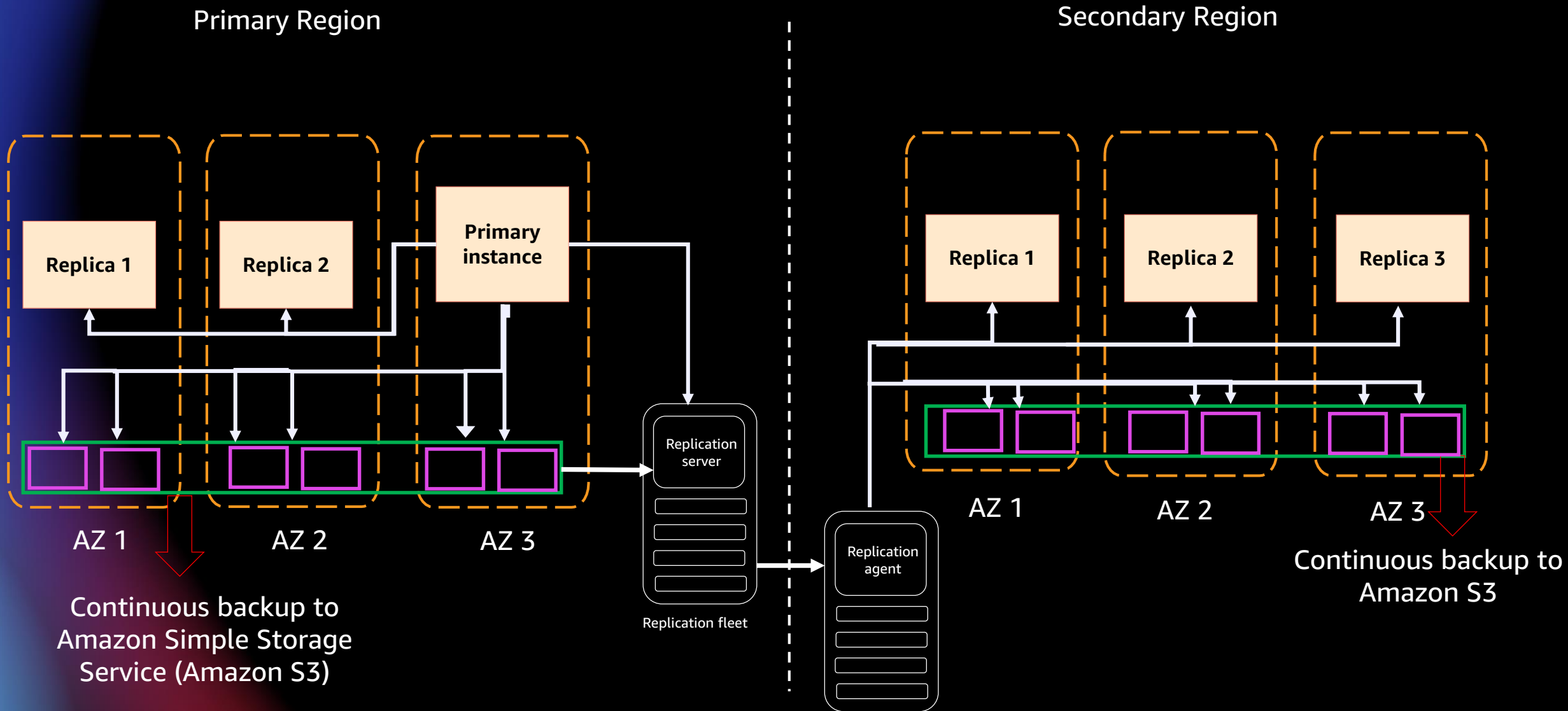
- ⇒ Still have 4/6 nodes
- ⇒ Maintain write availability

What if there is an AZ+1 failure?

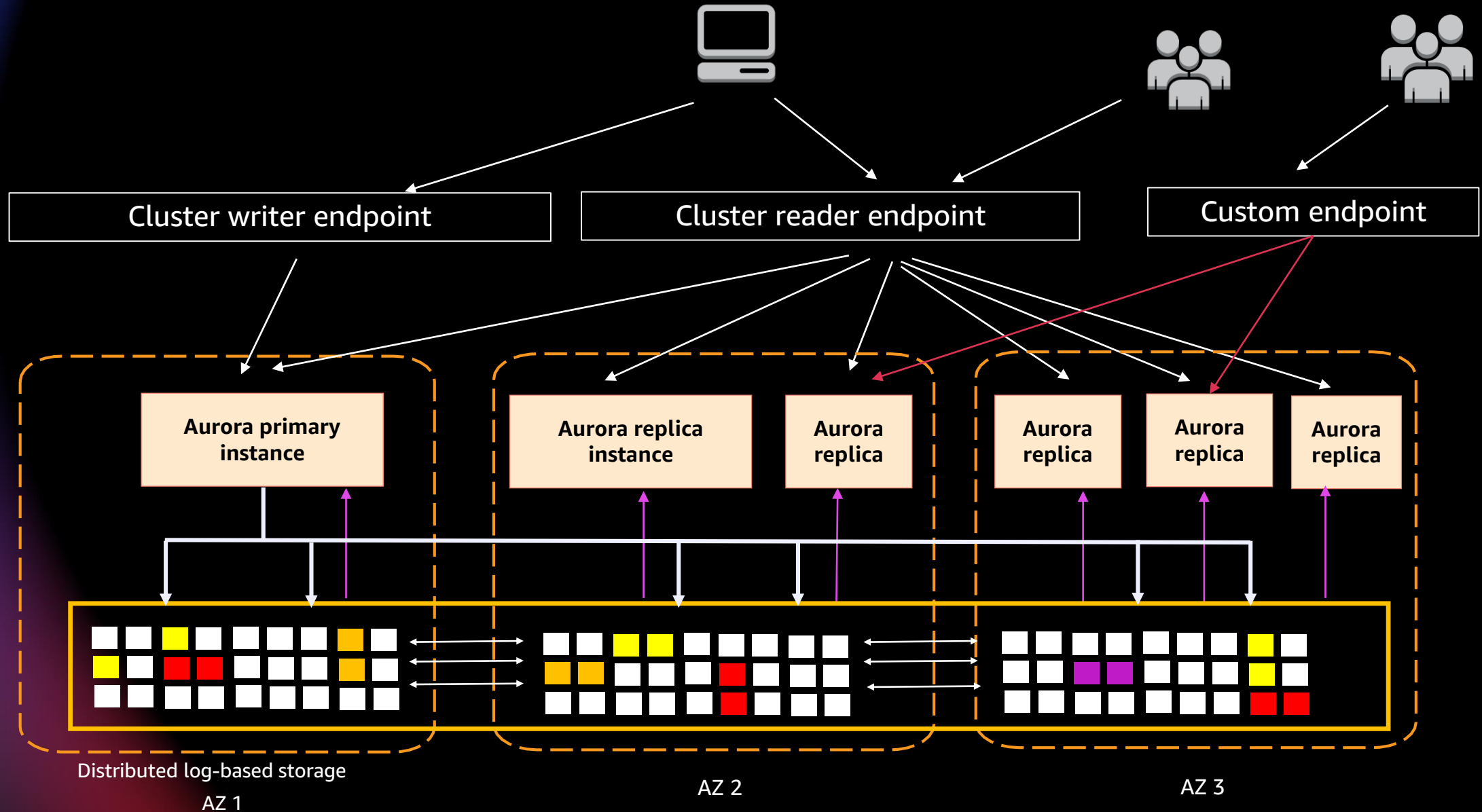
- ⇒ Still have 3 nodes (read / repair quorum)
- ⇒ No data loss
- ⇒ Rebuild failed node by copying from one of other 3
- ⇒ Recover write availability



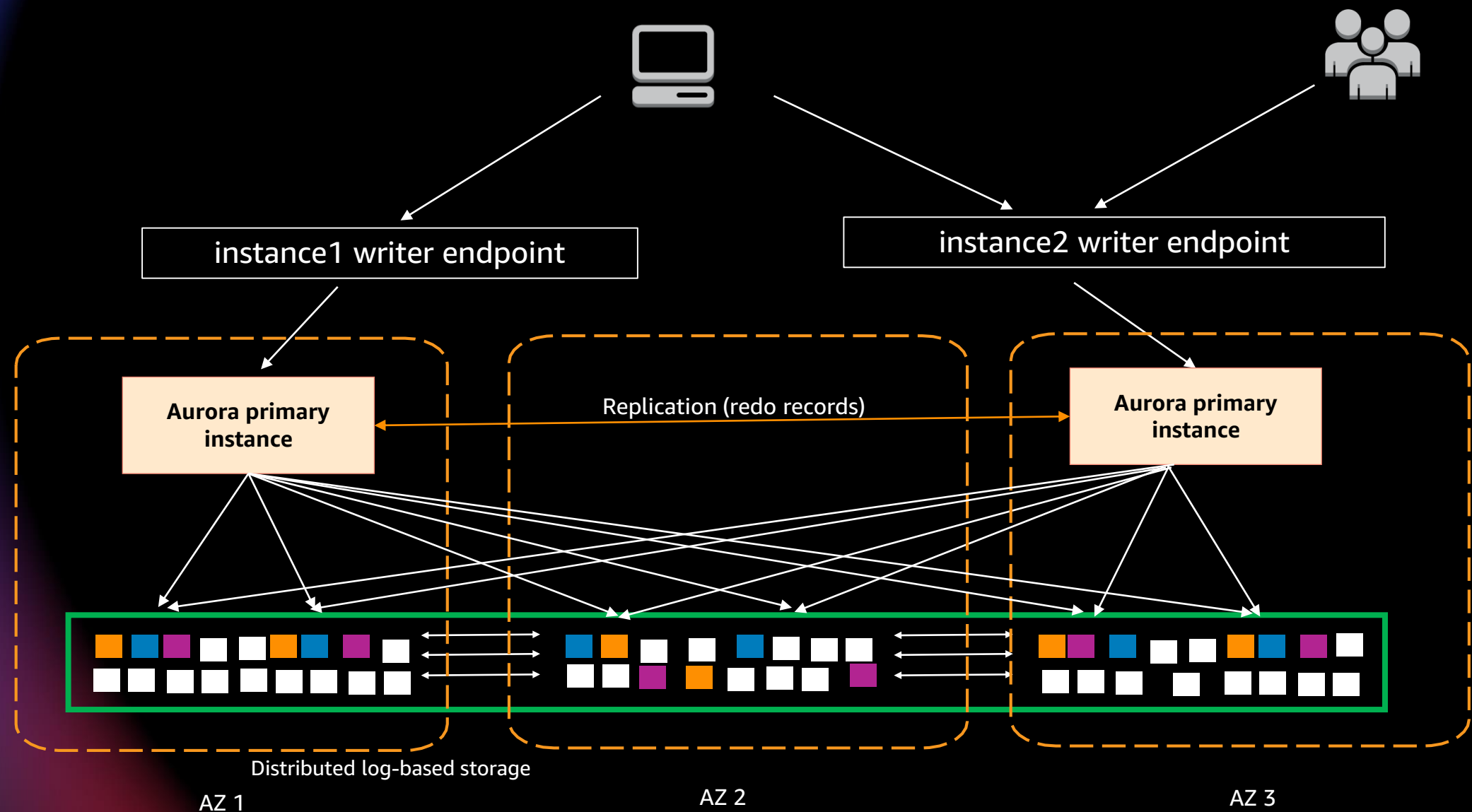
Amazon Aurora global database



Using Amazon Aurora read replica

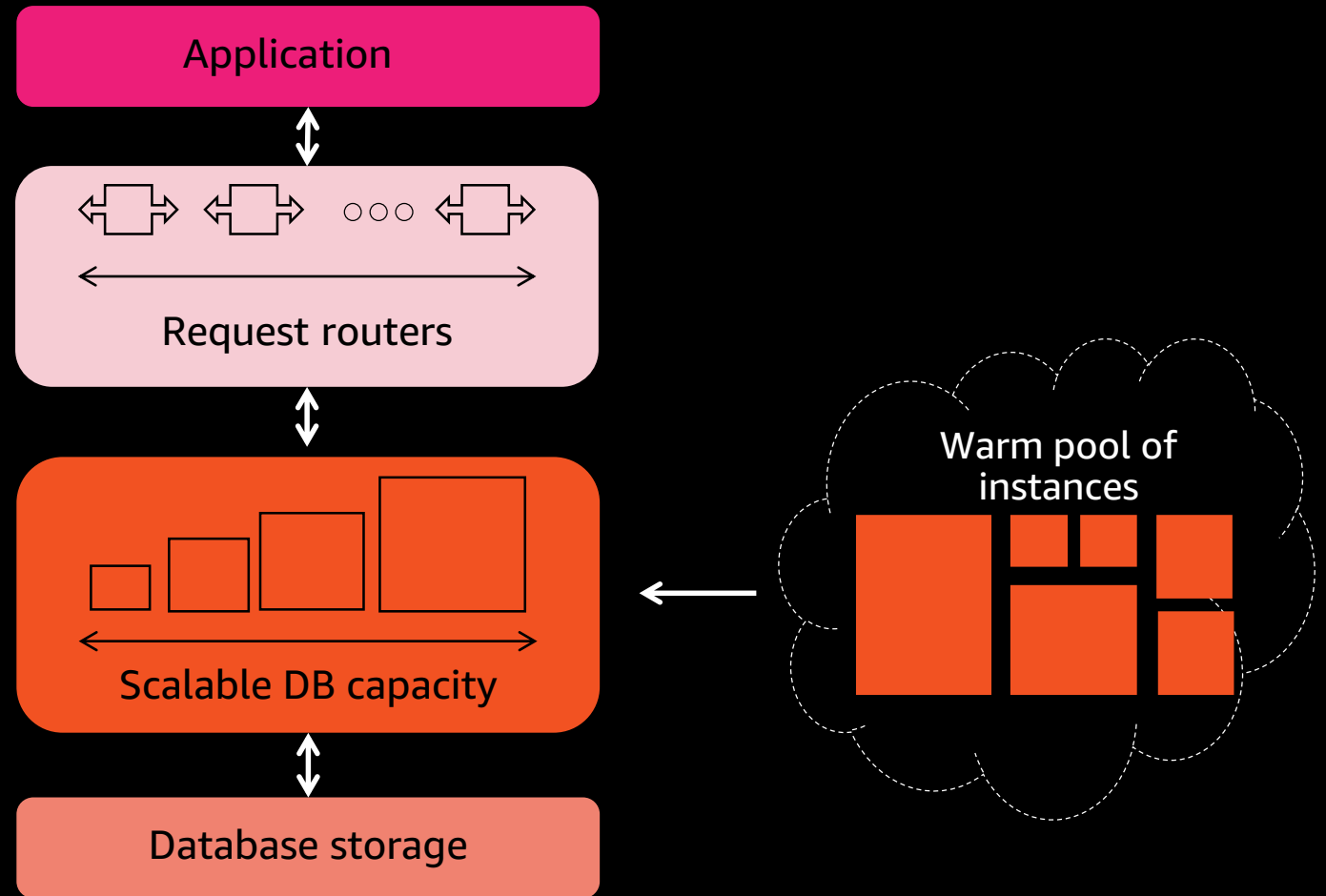


Continuous availability with Aurora multimaster (MySQL)



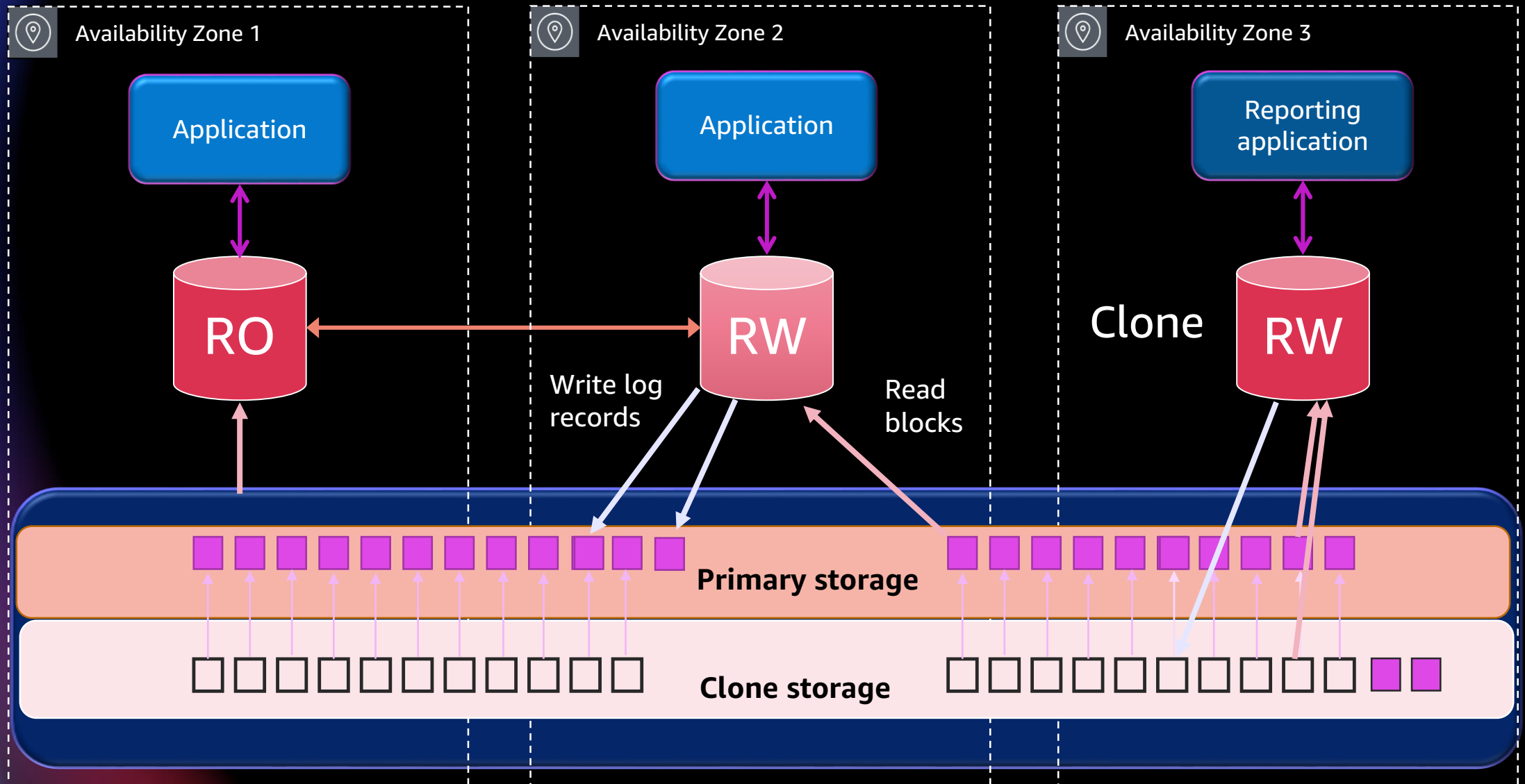
Amazon Aurora serverless architecture

- Starts up on demand, shuts down when not in use
- Scales up/down automatically
- Has no application impact when scaling
- Pay per second, 1-minute minimum

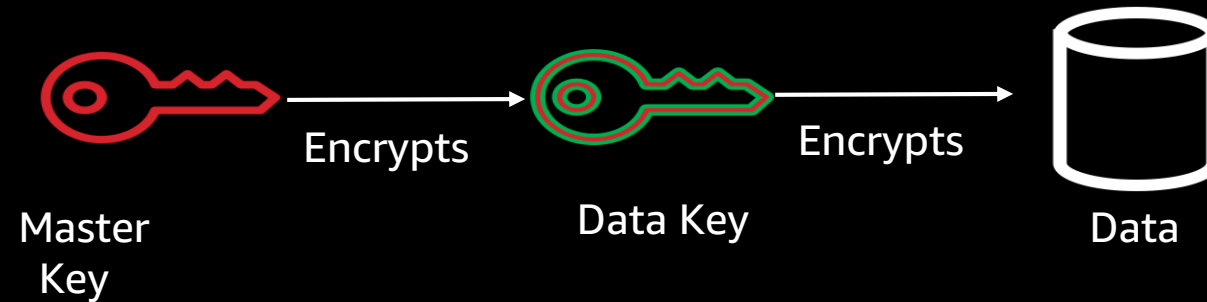
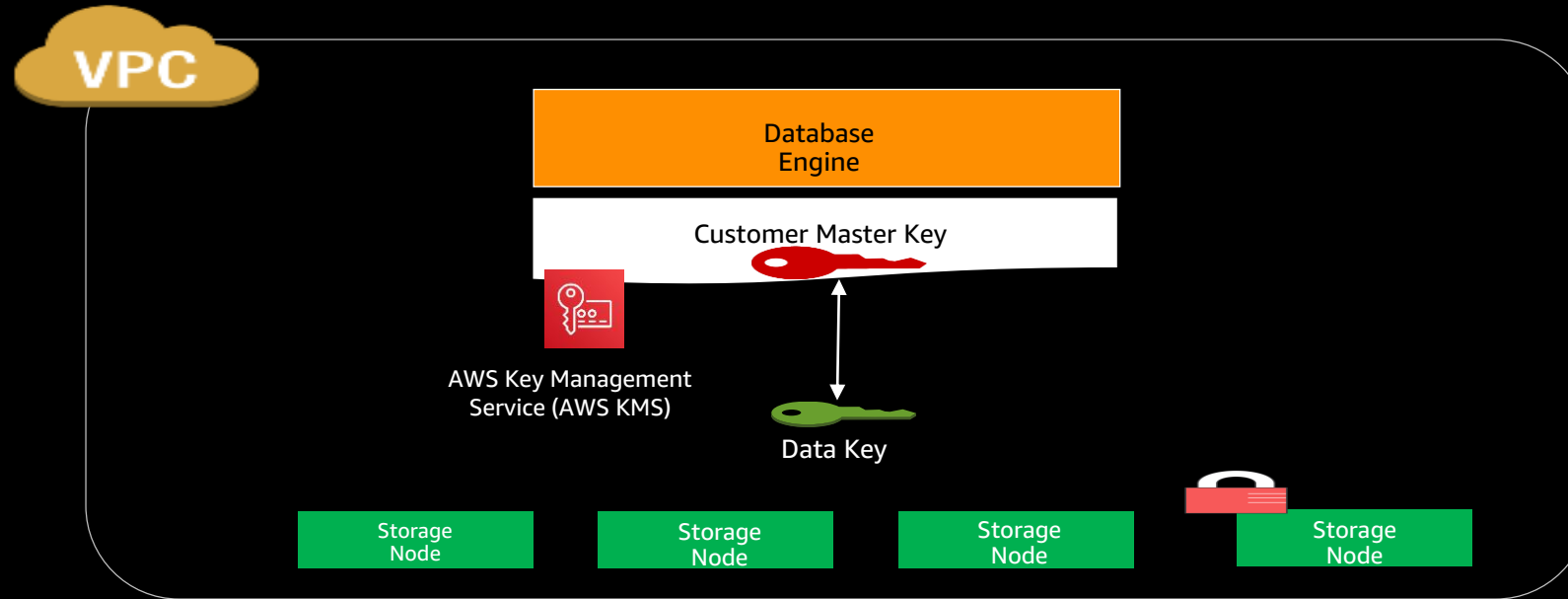


Using fast clones

Amazon Aurora storage



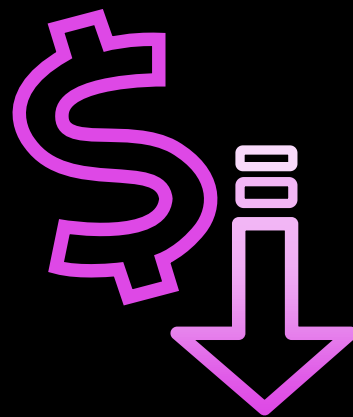
Encryption at rest



Lower TCO with Graviton2-powered instances



Highest performance
in their instance families



20% lower cost
vs same-sized comparable
instances



Up to 40% better
price-performance
vs comparable instances

Best price-performance within their instance families

Graviton2: Managed service enablement (Amazon RDS)

Graviton2 instances provide **up to 35% performance improvement** and **up to 52% price/performance improvement** for Amazon RDS open source databases depending on database engine, version, and workload.

Achieve up to 52% better price/performance with Amazon RDS using new Graviton2 instances

Posted On: Oct 15, 2020

AWS Graviton2-based database instances are now generally available for [Amazon Relational Database Service \(RDS\)](#). Graviton2 instances provide up to 35% performance improvement and up to 52% price/performance improvement for RDS open source databases depending on database engine, version, and workload. You can launch these database instances when using [Amazon RDS for MySQL](#), [Amazon RDS for PostgreSQL](#), and [Amazon RDS for MariaDB](#). Support for [Amazon Aurora](#) is coming soon.

AWS Graviton2 processors are custom built by Amazon Web Services using 64-bit Arm Neoverse cores and deliver several performance optimizations over first-generation AWS Graviton processors. This includes 7x the performance, 4x the number of compute cores, 2x larger private caches per core, 5x faster memory, and 2x faster floating-point performance per core. Additionally, the AWS Graviton2 processors feature always-on fully encrypted DDR4 memory and 50% faster per core encryption performance.

Source: <https://aws.amazon.com/about-aws/whats-new/2020/10/achieve-up-to-52-percent-better-price-performance-with-amazon-rds-using-new-graviton2-instances/>

Graviton2: Managed service enablement (Amazon Aurora)

Graviton2 instances provide up to 20% performance improvement and up to 35% price/performance improvement for Aurora depending on database size.

Achieve up to 35% better price/performance with Amazon Aurora using new Graviton2 instances

Posted On: Mar 12, 2021

AWS Graviton2-based database instances are now generally available for Amazon Aurora PostgreSQL Compatible Edition and Amazon Aurora MySQL Compatible Edition. Graviton2 instances provide up to 20% performance improvement and up to 35% price/performance improvement for Aurora depending on database size. You can also mix and match Graviton2 R6g and Intel R5 instances within the same cluster for your primary instance or for your read replica, enabling you to maximize price/performance improvements based on workload requirements. Graviton2 instances are already generally available for [Amazon RDS for MySQL](#), [Amazon RDS for PostgreSQL](#), and [Amazon RDS for MariaDB](#).

<https://aws.amazon.com/about-aws/whats-new/2021/03/achieve-up-to-35-percent-better-price-performance-with-amazon-aurora-using-new-graviton2-instances/>

Demo

Visit the AWS Data Resource Hub

Dive deeper with these resources, get inspired and learn how you can use data to make better decisions and innovate faster.

- Building a winning data strategy
- The new leadership mindset for data & analytics
- Harness data to reinvent your organization
- Put your data to work with a modern analytics approach
- Breaking free from on-premises database constraints
- Cloud storage adoption: From cost optimization to agility & innovation
- A strategic playbook for data, analytics, and machine learning
- ... and more!



<https://tinyurl.com/aws-data-resource>

Visit resource hub



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Thank you!