AWS Certified Solutions Architect — Associate (SAA-C01)

Module 10

AWS Database Services

Agenda

- RDS & Aurora
- Database Availability & Failover
- DB Migration Services
- DynamoDB & ElastiCache
- Labs

Common data categories and use cases

Relational

Referential integrity, ACID transactions, schema-on-write

Lift and shift, ERP, CRM, finance

Key-value

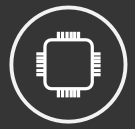
High throughput, low-latency reads and writes, endless scale

Real-time bidding, shopping cart, social, product catalog, customer preferences

Document

Store documents and quickly access querying on any attribute

Content management, personalization, mobile



In-memory

Query by key with microsecond latency

Leaderboards, real-time analytics, social caching

Graph

Quickly and easily create and navigate relationships between data

Fraud detection, social networking, recommendation engine

Time-series

Collect, store, and process data sequenced by time

IoT applications, event tracking

Ledger

Complete, immutable, and verifiable history of all changes to application data

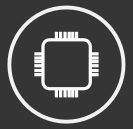
Systems of record, supply chain, health care, registrations, financial

Purpose-built databases

Relational

Key-value

Document



In-memory

Graph

Time-series

Ledger

Amazon RDS

DynamoDB

DocumentDB

ElastiCache

Neptune

Timestream

Quantum

Aurora | Community | Commercial

MySQL | MySQL | ORACLE

PostgreSQL | PostgreSQL | Microsoft SQL Server

MariaDB

redis | memcached

Relational Database Service (RDS)

Managed Relational Databases

- Resizable capacity (Scale up/down)
- Handles time-consuming tasks (provisioning & Administration)
- Multiple engine types available – Compatibility
- High durability options
- Automatic patching and backups
- At rest Encryption(KMS)/SSL Connectivity

RDS Engines

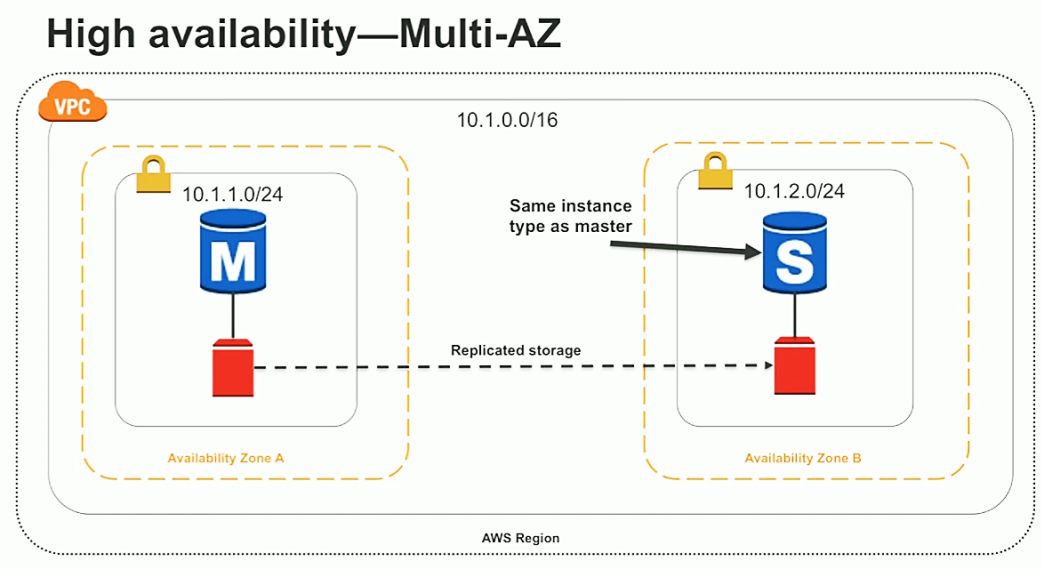
Commercial

Open Source

Cloud Native

Amazon Aurora

RDS Availability

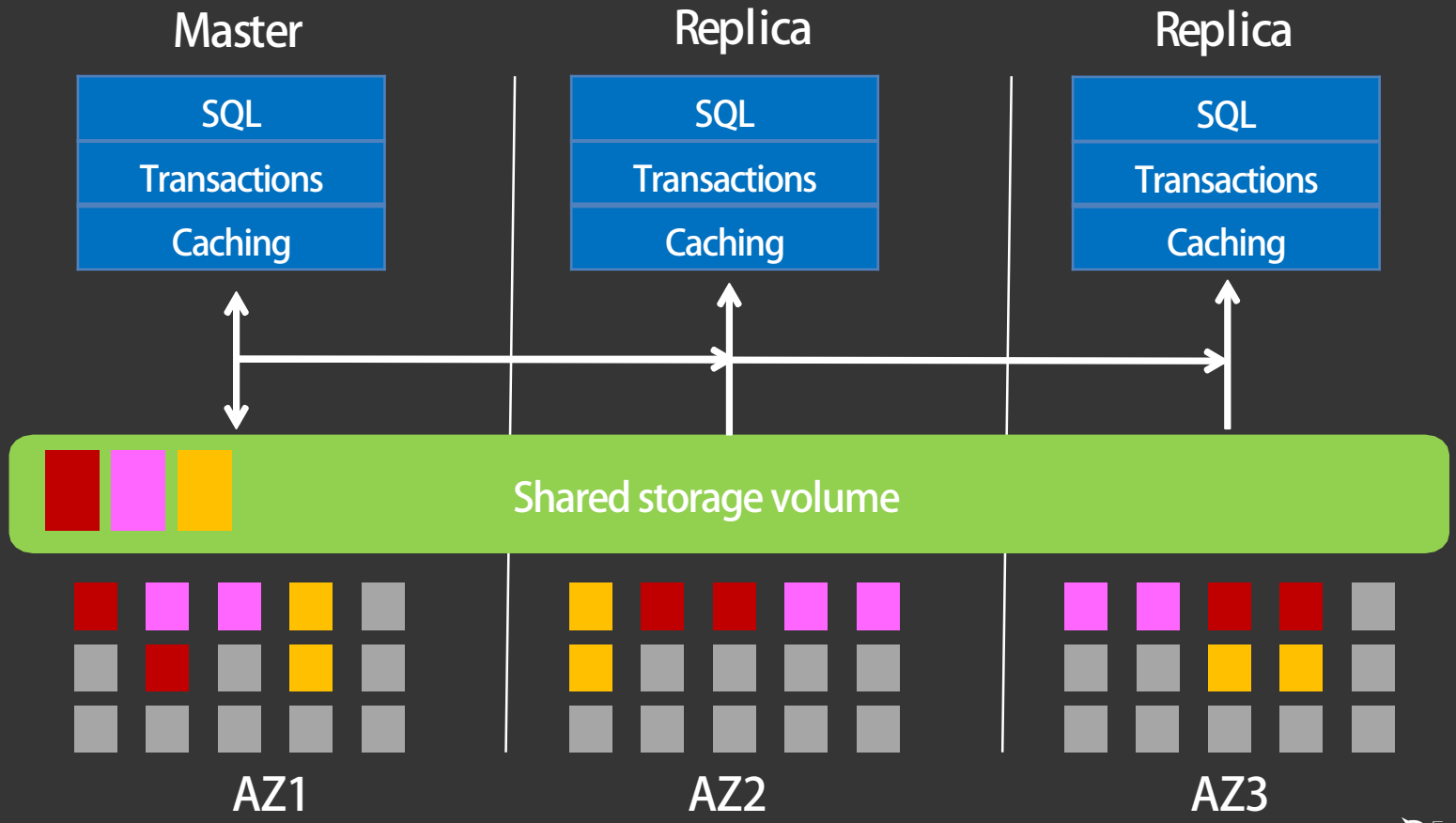


Amazon Aurora

Cloud Native Relational Database Engine

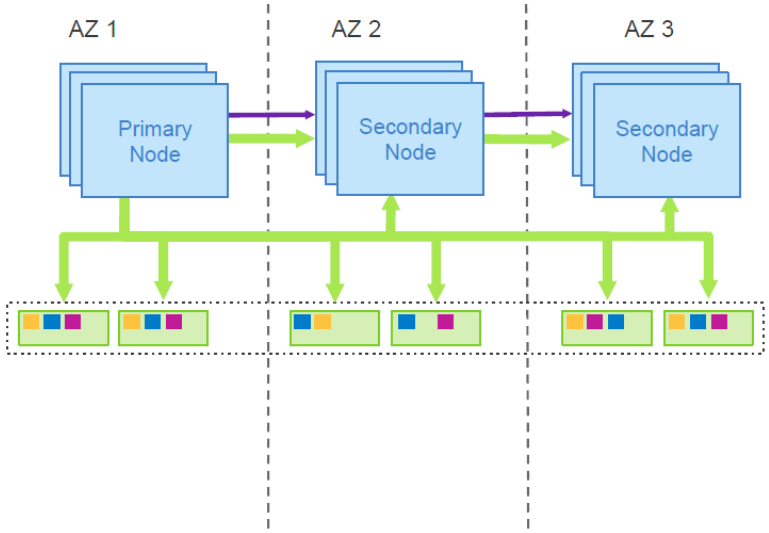
- Relational database built for the cloud
- Highly available, durable, and scalable
- Up to 64 TB database size, 15 read replicas
- Highly secure
- MySQL & PostgreSQL compatible

High Availability — Aurora Architecture



High availability—Amazon Aurora nodes

- Aurora cluster contains primary node and up to 15 secondary nodes
- Failing database nodes are automatically detected and replaced
- Failing database processes are automatically detected and recycled
- Secondary nodes automatically promoted on persistent outage, no single point of failure
- Customer application can scale out read traffic across secondary nodes



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

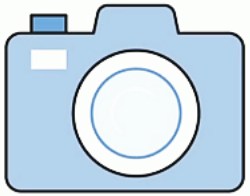
MySQL, PostgreSQL, MariaDB, Oracle, SQL Server

- Scheduled daily volume backup of entire instance
- Archive database change logs
- 35-day retention
- Multiple copies in each AZ when running multi-AZ
- Taken from standby when running multi-AZ

Aurora

- Automatic, continuous, incremental backups
- No impact on database performance
- 35-day retention

Snapshots



Use cases

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

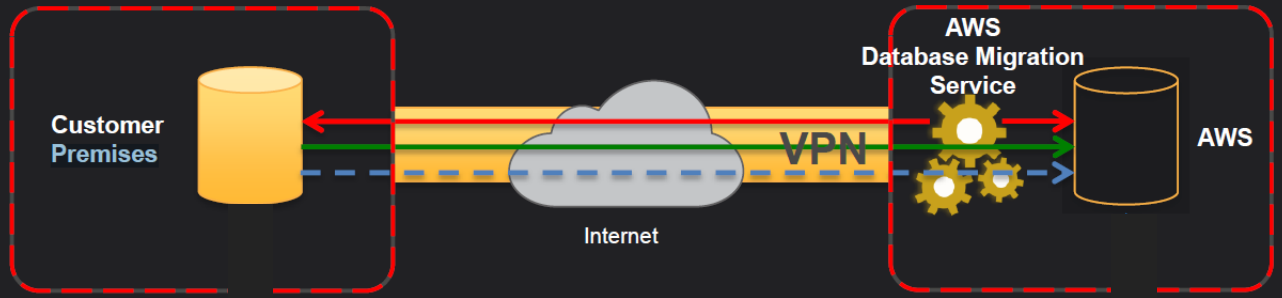
AWS Database Migration Service

PostgreSQL ORACLE Amazon Aurora

AMAZON REDSHIFT MySQL MariaDB Microsoft SQL Server

- ✓ Move data to the same or different database engine
- ✓ Keep your apps running during the migration
- ✓ Start your first migration in 10 minutes or less
- ✓ Replicate within, to, or from Amazon EC2 or RDS

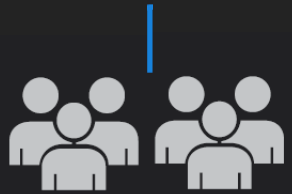
Keep your apps running during data migration



Start a replication instance

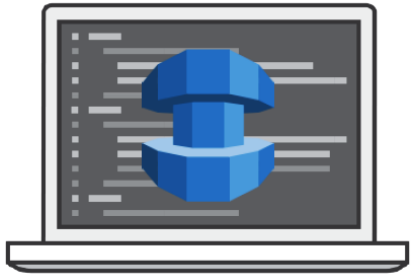
Connect to source and target databases

Select tables, schemas or databases



Let the AWS Database Migration Service create tables, load data and keep them in sync

Switch applications over to the target at your convenience



AWS Schema Conversion Tool

- ✓ Migrate from Oracle and SQL Server
- ✓ Move your tables, views, stored procedures, and data manipulation language (DML) to MySQL, MariaDB, and Aurora
- ✓ Highlight where manual edits are needed

DynamoDB

Predictable and Scalable NoSQL Data Store

- Fast, fully-managed NoSQL Database Service
- Serverless – No hardware provisioning or software patching
- Capable of handling any amount of data at single-digit millisecond response time
- Durable and Highly Available
- All SSD storage
- Simple and Cost Effective

ElastiCache

In-Memory Cache

- Managed cache service
- Supports Memcached or Redis
- Simple resizing through API or console
- Integrates with Cloudwatch and SNS