

Databases on AWS

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Agenda

- AWS Database Services
- Traditional vs AWS Data services model
- Amazon RDS
- Redshift
- DynamoDB
- ElastiCache
- Neptune



AWS Database Services



Managed Relational Database Service



Petabyte-scale Data Warehouse Service



In-Memory key Value Store Service



NoSQL Key Value Oriented Service



NoSQL Graph
Oriented Service



NoSQL Document Oriented Service Mongo Compatible



Time Series
Database Service



Quantum Ledger Database Service



Traditional Database Architecture

one database
for all
workloads

Client Tier

App/Web Tier

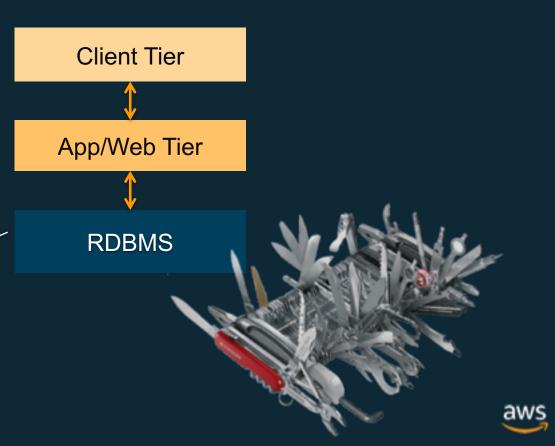
RDBMS



Traditional Database Architecture

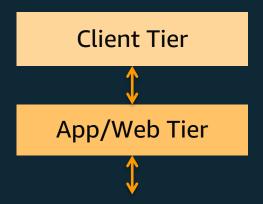
Key-value access
Complex queries
OLAP transactions
Analytics

All forced into the relational database



AWS Data Tier Architecture

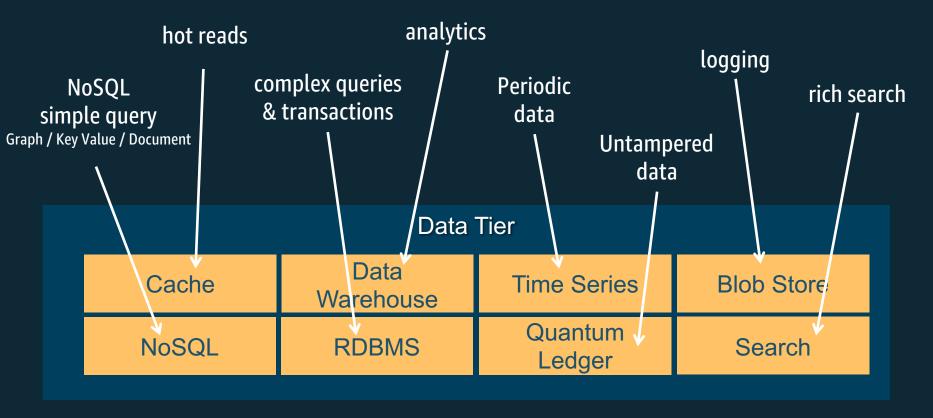
On AWS choose best database service for each workload



Data Tier				
Cache	Data Warehouse	Time Series	Blob Store	
NoSQL	RDBMS	Quantum Ledger	Search	

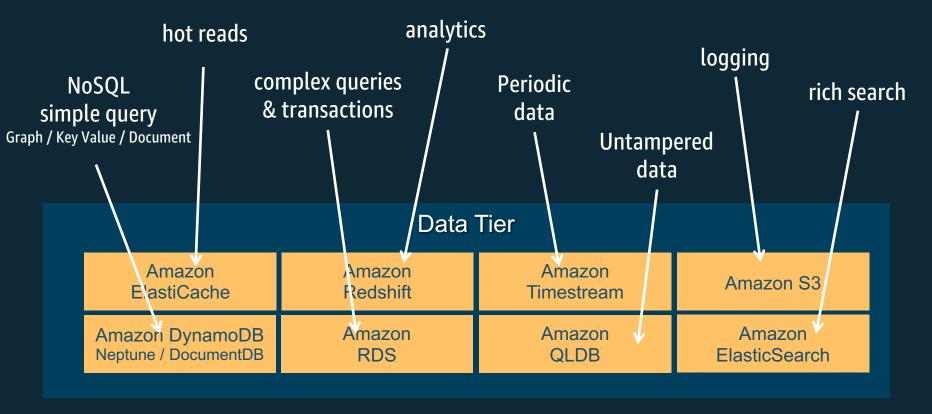


Workload Driven Data Store Selection





AWS Database Services for the Data Tier







Relational Databases

Amazon Aurora, MySQL, PostgreSQL, Oracle, SQL Server, MariaDB

Fully managed















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

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If you choose Amazon RDS

App optimization

Scaling

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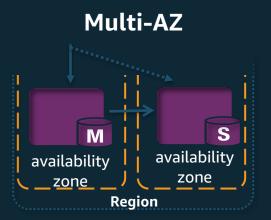
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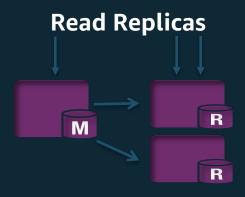


Key Amazon Amazon RDS Features

Amazon RDS Configuration	Improve Availability	Increase Throughput	Reduce Latency
Push-Button Scaling		4	
Multi AZ	*		
Read Replicas		*	
Provisioned IOPS		~	4











Amazon RDS -- Aurora

Amazon Aurora is a MySQL-compatible relational database engine

- Built from the ground up to leverage AWS
- Speed and availability of high-end commercial databases
- Simplicity and cost-effectiveness of open source databases

Retains compatibility with MySQL 5.6

Up to 5x better performance than MySQL

At a price point 1/10 of a commercial database

- Data is transparently replicated 6 ways among 3 Availability Zones
- Encryption at rest and in transit
- Add up to 15 Replicas

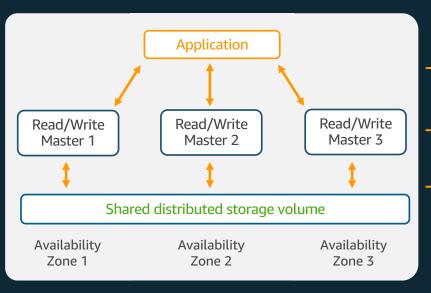
Compatibility with PostgreSQL



Aurora Multi-Master

First relational DB service with scale-out reads and writes, across multiple datacenters

Scale out both reads and writes



Zero application downtime from ANY instance failure

Zero application downtime from ANY AZ failure

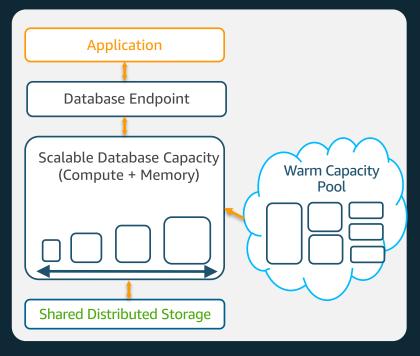
Faster write performance and higher scale

Sign up for single-region multi-master preview today; multi-region multi-master coming in 2019



Aurora Serverless

On-demand, auto-scaling database for applications with variable workloads



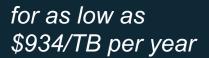
Starts up on demand, shuts down when not in use

Automatically scales with no instances to manage

Pay per second for the database capacity you use







Petabyte scale

Massively parallel

Columnar Store

Relational data warehouse

Fully managed = no admin



Amazon Redshift

Fast and powerful, petabyte-scale data warehouse

- Fully managed Relational Database
- Highly-parallel
- Columnar Data Store

Data warehouse-type queries

- Aggregations, historical analysis
- BI Tool integration

Grow with your data

• 160 GB → 1.6 PB

SSD and SAS Options

SSD provides 10-15x perf @ 5.5x the cost per TB/year





AWS DMS & AWS SCT

AWS Database Migration Service (DMS) easily and securely migrates and/or replicates your databases *and* data warehouses to AWS





AWS Schema Conversion Tool (SCT) converts your commercial database and data warehouse schemas to open-source engines, Amazon Aurora and Redshift. Converts and loads data warehouse data into Amazon Redshift

We have migrated over 103,000 unique databases. And counting...





NoSQL Database

Seamless scalability

Zero admin

Single digit millisecond latency

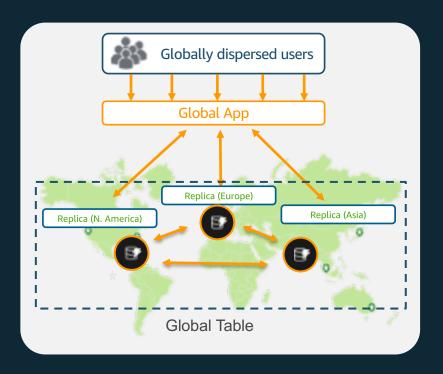
Multi-Master

Multi-Region



DynamoDB Global Tables

First fully managed, multi-master, multi-region database



Build high performance, globally distributed applications

Low latency reads & writes to locally available tables

Disaster proof with multi-region redundancy

Easy to setup and no application re-writes required



NoSQL vs. SQL for a new app: how to choose?

Want simplest possible DB management?

Want app to manage DB integrity?



Need joins, transactions, frequent table scans?

Want DB engine to manage DB integrity?

Team has SQL skills?





Amazon ElastiCache

In-memory cache in the cloud
Improve latency and throughput for read-heavy workloads
Supports open-source caching engines

- Memcached
- Redis

Fully managed Multi-AZ

Examples

- Caching of MySQL database query results
- Caching of post-processing results
- Caching of user session & frequently accessed data





Amazon Neptune

Fully managed graph database for highly connected data



Open



Supports Apache TinkerPop™ & W3C RDF graph models Fast & Scalable



Store billions of relationships; query with millisecond latency

Reliable



6 replicas of your data across 3 AZs with full backup and restore

Easy



Build powerful queries easily with Gremlin and SPARQL

F

GRAPHQL with AppSync



It's all about choice

Performance-oriented Cost-oriented



Any Questions?





