

Track 3 | Session 6

打造應用專屬資料庫 (Purpose-built) 與 了解託管服務優勢

Taylor Chu

Cloud Support Engineer

Amazon Web Services

Agenda

- Modernize and break free
- AWS databases: The right tool for the right job
- Why consider purpose-built databases?
- Managed database services
- Q&A

Modernize and break free

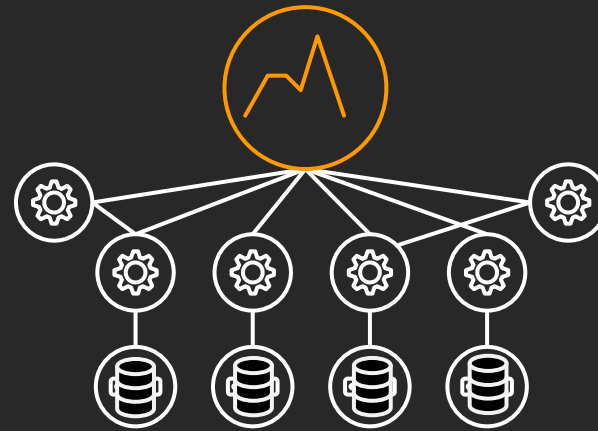
Rapid expansion of data requirements

Explosion of data



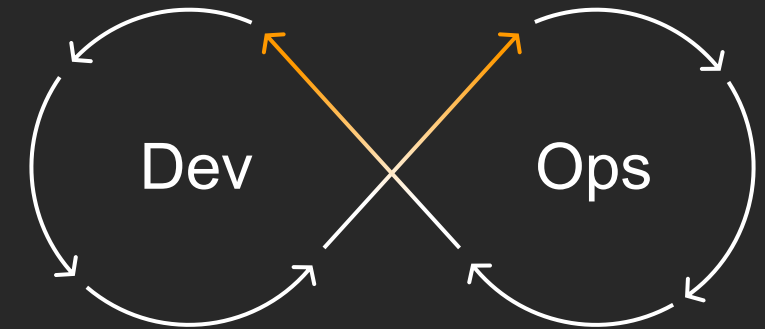
Data grows 10x every 5 years
driven by network-connected
smart devices

Microservices change data and analytics requirements



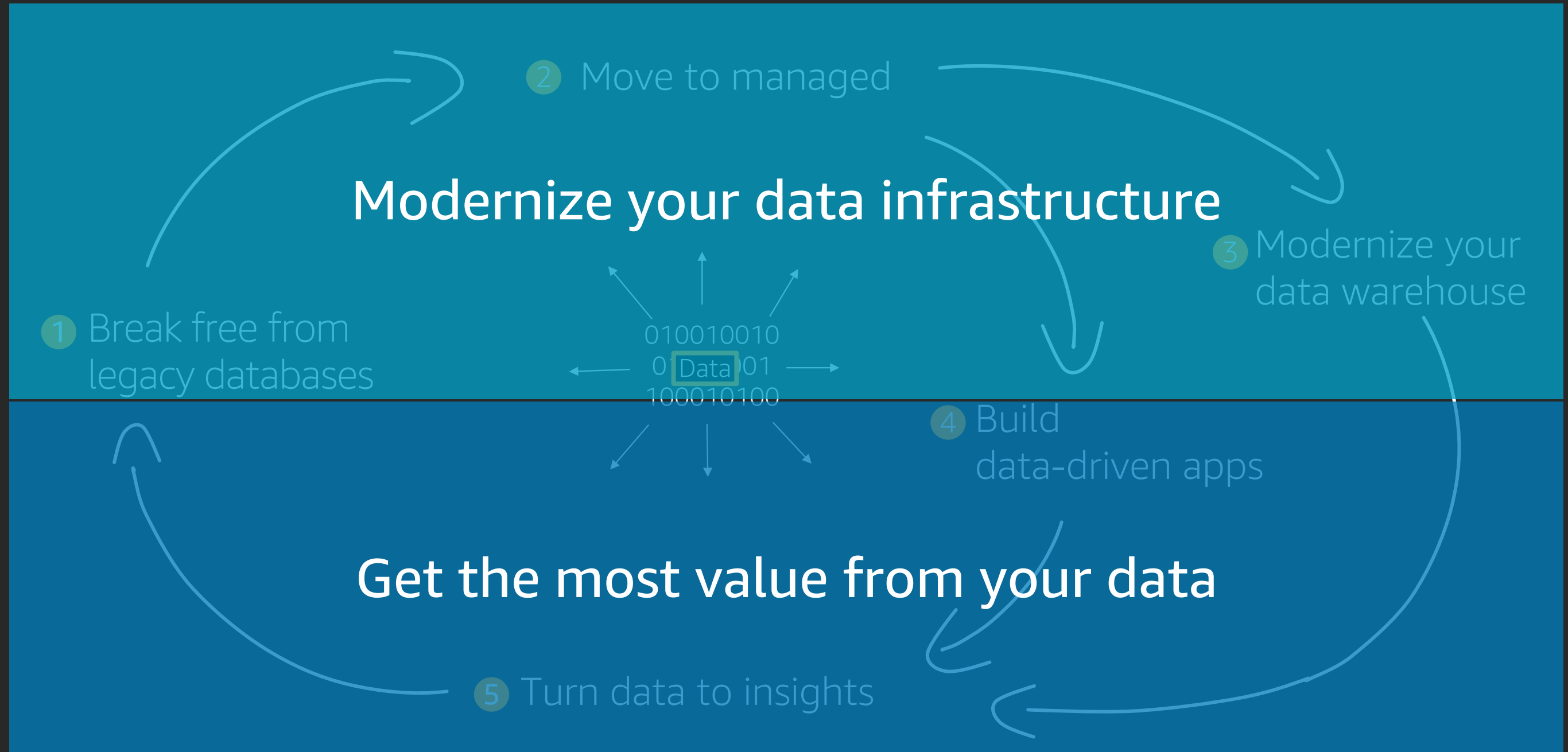
Microservices architecture
decreases need for “one size fits all”
databases and increases need for
real-time monitoring and analytics

Accelerated rate of change driven by DevOps



Transition from IT to DevOps
increases rate of change

Data flywheel



Managing databases on-premises: Time-consuming and complex

- Hardware and software installation
- Database configuration, patching, and backups
- Cluster setup and data replication for high availability
- Capacity planning, and scaling clusters for compute and storage

The thorns of legacy databases



Costly



Proprietary



Lock-in



Punitive licensing



You've got mail

Break free with AWS

Performance at scale

3–5x the performance

Cost effective

1/10 the cost of
commercial databases

Fully managed

Remove administrative
complexities and
automatically scale

Reliable

Safeguarded, scalable,
and secure applications

AWS databases: The right tool for the right job

Purpose-built databases



Amazon Aurora

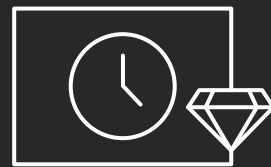


MySQL and PostgreSQL-compatible relational database built for the cloud



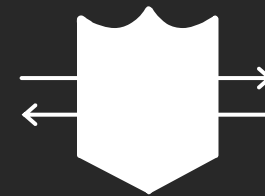
Performance & scalability

5x throughput of standard MySQL and 3x of standard PostgreSQL; scale out up to 15 read replicas



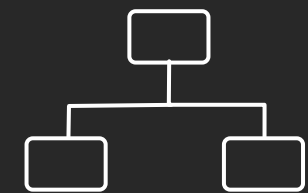
Availability & durability

Fault-tolerant, self-healing storage; 6 copies of data across 3 AZs; continuous backup to Amazon S3



Highly secure

Network isolation, encryption at rest / in transit



Fully managed

Managed by Amazon RDS: On your part, no server provisioning, software patching, setup, configuration, or backups

Amazon DynamoDB



Fast and flexible key-value database service for any scale



Performance at scale

Consistent, single-digit millisecond response times at any scale; build applications with virtually unlimited throughput



Serverless architecture

No hardware provisioning, software patching, or upgrades; scales up or down automatically; continuously backs up your data



Enterprise security

Encrypts all data by default and fully integrates with AWS Identity and Access Management for robust security



Global replication

You can build global applications with fast access to local data by easily replicating tables across multiple AWS Regions

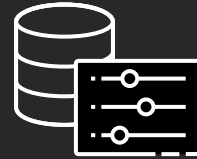
Amazon DocumentDB



Fast, scalable, highly available MongoDB-compatible database service



Millions of requests per second,
millisecond latency



Same code, drivers, and tools
you use with MongoDB



Simple and
fully managed



Secure and
compliant



2x throughput of
managed MongoDB services



Deeply integrated
with AWS services

Amazon ElastiCache



Managed, Redis, or Memcached-compatible in-memory data store



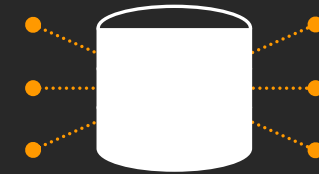
Unlimited scale

Read scaling with replicas;
write and memory scaling with
sharding; nondisruptive scaling



Consistent high performance

In-memory data store
and cache for sub-millisecond
response times



Fully managed

AWS manages all hardware
and software setup,
configuration, and monitoring

Amazon Neptune



Fast, reliable graph database built for the cloud

Open



Supports Apache TinkerPop & W3C RDF graph models

Fast



Queries billions of relationships with millisecond latency

Reliable



Six replicas of your data across three Availability Zones, with full backup and restore

Easy



Build powerful queries easily with Gremlin and SPARQL

Amazon Timestream

Fast, scalable, fully managed time series database



1,000x faster and 1/10th the cost of relational databases



Collect data at the rate of millions of inserts per second (10M/second)

Trillions of daily events



Adaptive query processing engine maintains steady, predictable performance

Time-series analytics



Built-in functions for interpolation, smoothing, and approximation

Serverless



Automated setup, configuration, server provisioning, and software patching

Amazon Quantum Ledger Database



Fully managed ledger database: Track and verify history of all changes made to your application's data

Immutable and transparent



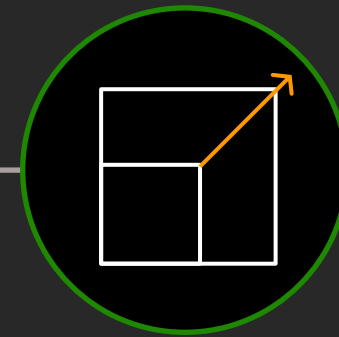
Append-only, immutable journal tracks history of all changes that cannot be deleted or modified; get full visibility into entire data lineage

Cryptographically verifiable



All changes are cryptographically chained and verifiable

Highly scalable



Executes 2–3x as many transactions as ledgers in common blockchain frameworks

Easy to use



Flexible document model, query with familiar SQL-like interface

Amazon Keyspaces (for Apache Cassandra)

Scalable, highly available, and managed Apache Cassandra-compatible database service



Apache Cassandra-compatible



Use the same Cassandra drivers and tools

No servers to manage



No need to provision, configure, and operate large Cassandra clusters

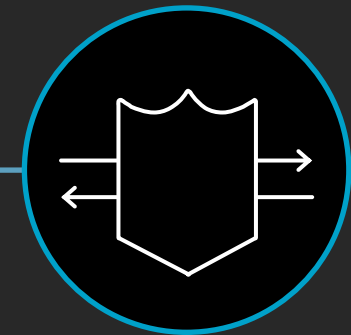
Single-digit millisecond performance at scale



Automatically scale tables up and down

Virtually unlimited throughput and storage

Highly available and secure



99.99% availability SLA within an AWS Region

Data encrypted at rest; integrated with IAM

Why consider purpose-built databases?

Why consider purpose-built databases?



Scale



Performance



Availability



Duolingo uses AWS databases to serve up **over 31 billion items** for 80 language courses with **high performance and scalability**

Primary database: **Amazon DynamoDB**

- 24,000 reads and 3,000 writes per second
- Personalize lessons for users taking 6B exercises per month

In-memory caching: **Amazon ElastiCache**

- Instance access to common words and phrases

Transactional data: **Amazon Aurora**

- Maintain user data



Capital One migrated its monolithic mainframe to **highly available** AWS databases for microservices-based applications

Transactional data: **Amazon RDS**

- State management

Analytics: **Amazon Redshift**

- Web logs

Consistent low latency: **Amazon DynamoDB**

- User data and mobile app

Managed database services

Fully managed services on AWS

Spend time innovating and building new applications, not managing infrastructure

Self-managed

You

Schema design
Query construction
Query optimization
Automatic failover
Backup and recovery
Isolation and security
Industry compliance
Push-button scaling
Automated patching
Advanced monitoring
Routine maintenance
Built-in best practices

Fully managed

You

AWS

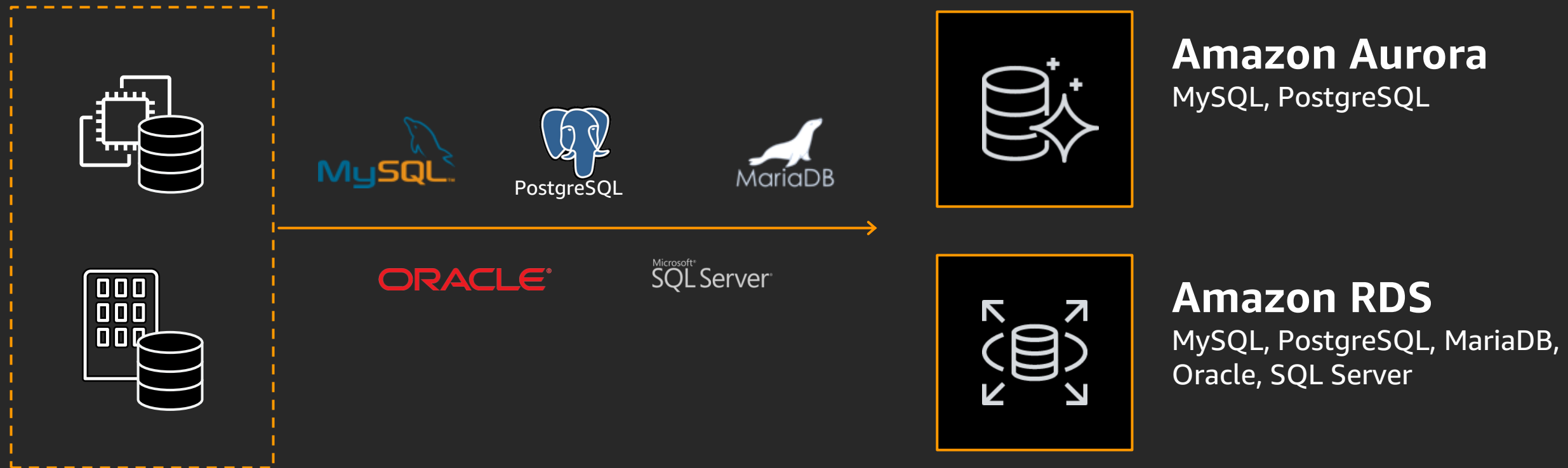
Move to managed relational databases

Migrate on-premises or cloud-hosted relational databases to managed services

Reduce database administrative burden

No need to re-architect existing applications

Get better performance, availability, scalability, and security



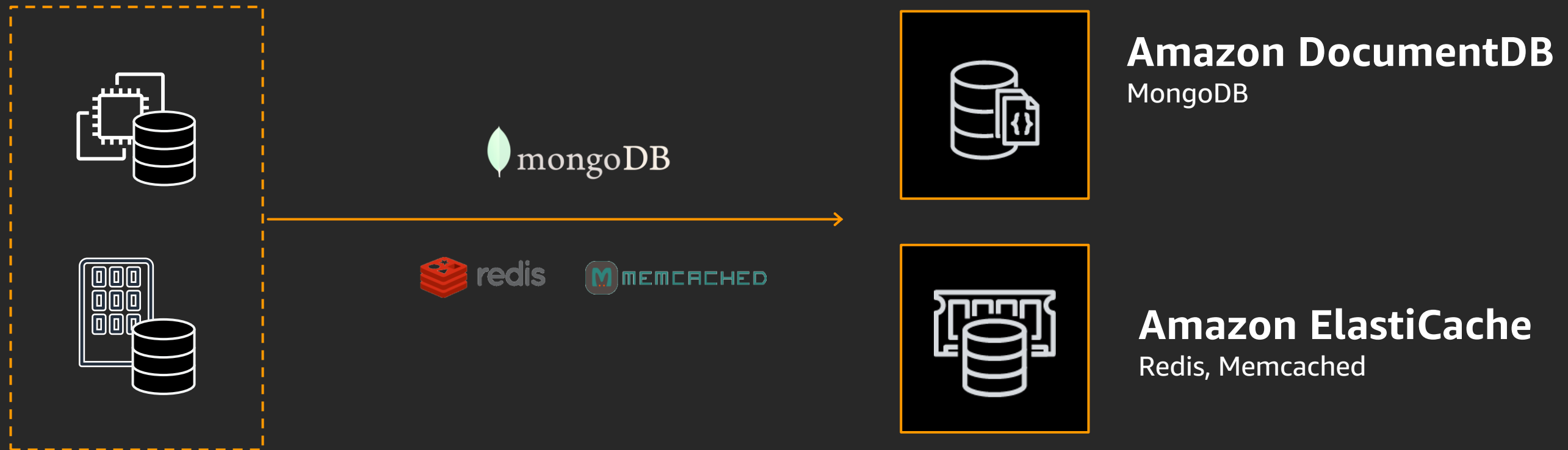
Move to managed non-relational databases

Migrate on-premises or cloud-hosted non-relational databases to managed services

Reduce database administrative burden

No need to re-architect existing applications

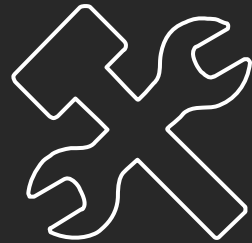
Get better performance, availability, scalability, and security



Move to AWS services to break free from the infrastructure muck



Broad
portfolio



Fully
managed



Highly
available
and durable



Most
secure with
support for
compliance



Challenge

They experienced service admin challenges with their original provider and wanted to scale business to the next level.

Solution

They moved from self-managed MySQL to Amazon Aurora MySQL. They use Aurora as the primary transactional database, Amazon DynamoDB for personalized search, and Amazon ElastiCache as in-memory store for sub-millisecond site rendering.

Result

“Initially, the appeal of AWS was the ease of managing and customizing the stack. It was great to be able to ramp up more servers without having to contact anyone and without having minimum usage commitments. AWS is the easy answer for any Internet business that wants to scale to the next level.”

—Nathan Blecharczyk, Cofounder and CTO of Airbnb



..... MOVE TO MANAGED →



Amazon
Aurora



Amazon
DynamoDB



Amazon
ElastiCache

Get started

See more information at:

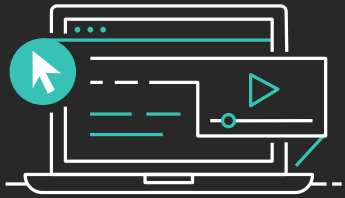
aws.amazon.com/databases

Contact us at:

<https://aws.amazon.com/contact-us/>

Learn databases with AWS Training and Certification

Resources created by the experts at AWS to help you build and validate database skills



25+ free digital training courses cover topics and services related to relational and nonrelational databases



The classroom offering, Planning and Designing Databases on AWS, features AWS expert instructors and hands-on activities



Validate expertise with the AWS Certified Database – Specialty exam

Visit the databases learning path at aws.amazon.com/training/path-databases

Thank you!

Taylor Chu
Cloud Support Engineer
Amazon Web Services