



COSMOS 101

How you became a COSMONAUT in 20
minutes or less



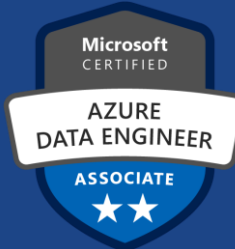
WELCOME!



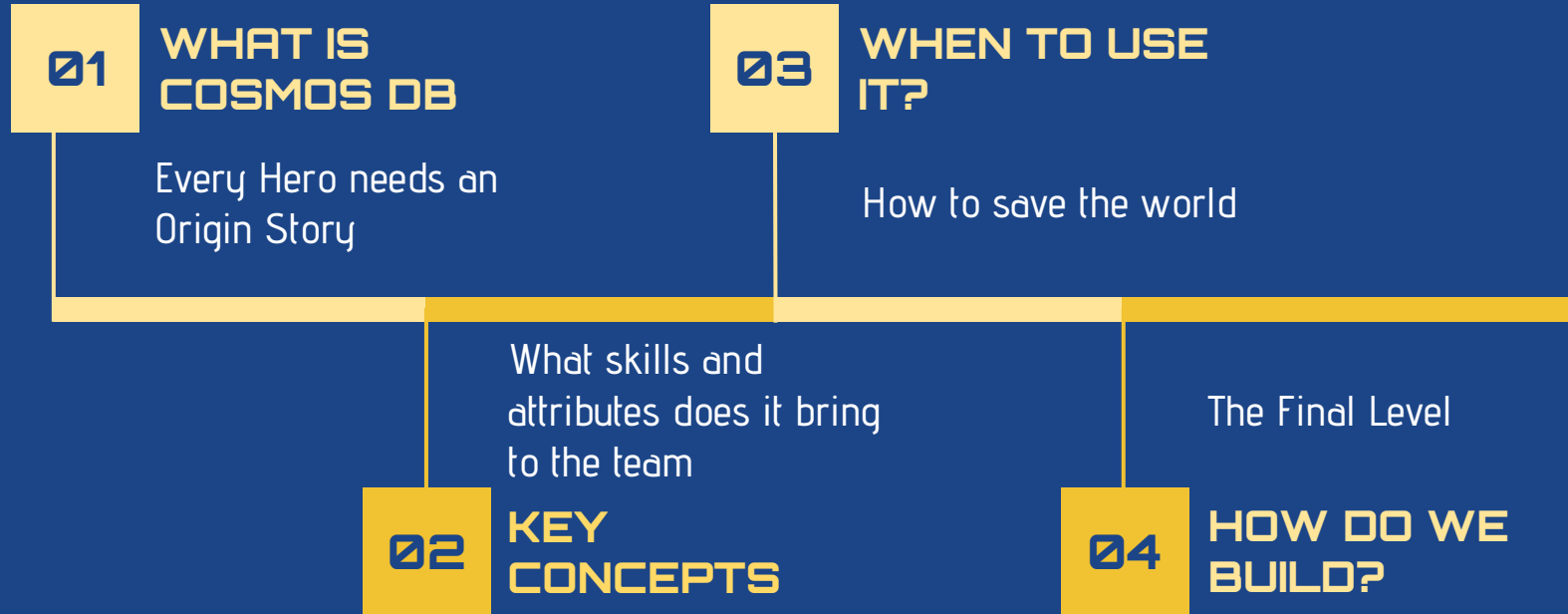
Scott Bell



- Senior Consultant at **Avanade** and Previously **Altius**.
- Avanade UK&I **Databricks SME**
- Interested in Azure Data Platforms, Architecture and Design Patterns
- Masters Degree in Computer Science Focusing on Machine Learning in the Cloud
- Passionate about Beer, Rugby League and Most things that aren't Excel!



QUEST INTO THE COMSOS





01

WHAT IS COSMOS

Every Hero needs an Origin Story





WHAT IS IT?



Azure Cosmos DB is a fully managed NoSQL database service that has “Planet Scale”





NO SQL



NoSQL databases are “non-relational,” schemaless, datastores that handle unstructured data





MANAGED



SLA backed PaaS offering with the ability to instantly scale, be highly available, distribute data workloads and have enterprise security.





PLANET SCALE



REPLICATE

Your data
geolocated to your
applications and
users

Distribute

Read and Write
between different
regions to increase
scalability

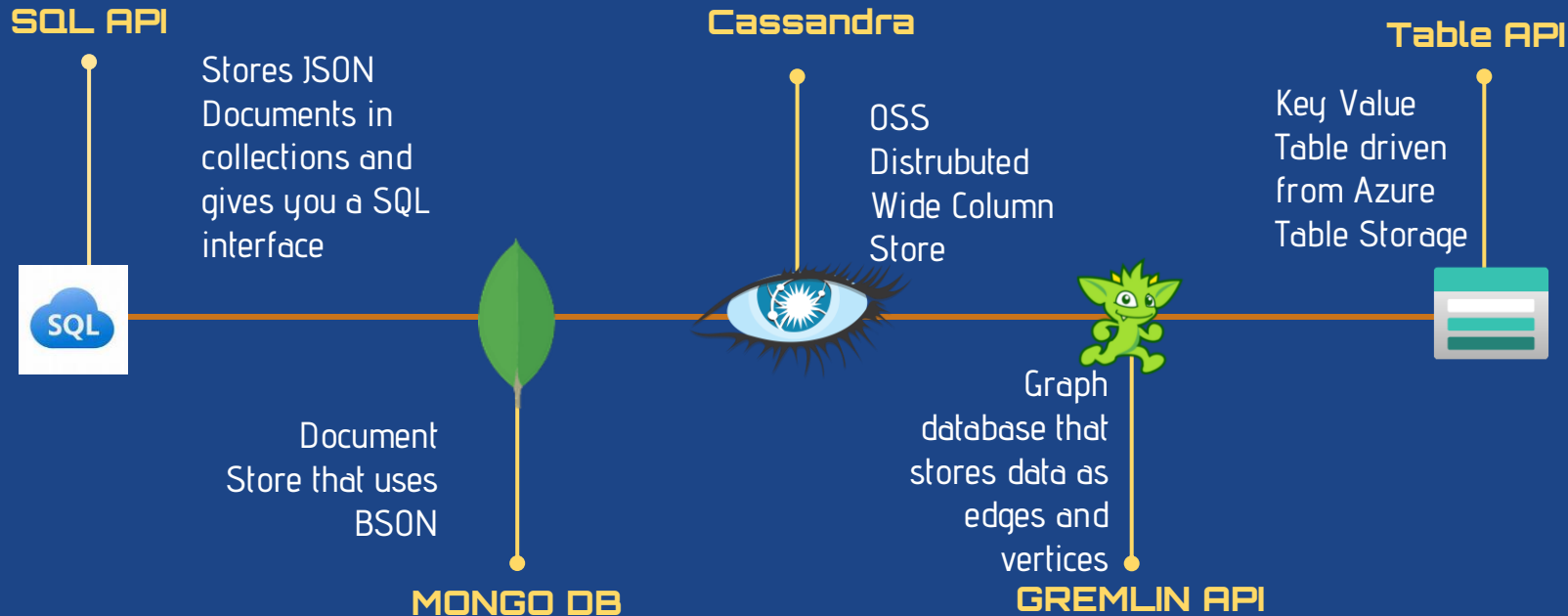


99.999%

SLAs or your money back*



Multi Modal





RECAP



NO SQL

NO FIXED SCHEMAS and IS NONE
RELATIONAL

DISTRIBUTED

DATA IS REPLICATED BETWEEN
DATA CENTRES WITH LOW LATENCY

HIGH THROUGHPUT

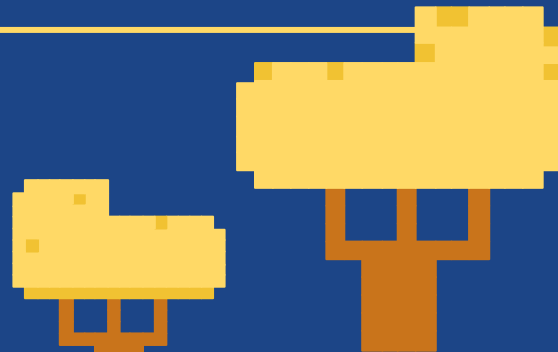
HANDLES LARGE VOLUMES &
VELOCITIES OF DATA ACROSS THE
WORLD

HIGHLY SCALABLE

PLANET SCALE PERFORMANCE
ACROSS THE GLOBLE

MULTI MODAL

Lots of different APIs to support
different USECASES (i.e GRAPH,
JSON, KEY VALUE PAIRS)





02

KEY CONCEPTS

KEY SKILLS AND ATTRIBUTES



COMPONENTS



DATABASE



ITEMS

1

2

3

4

CONTAINERS

Request Units

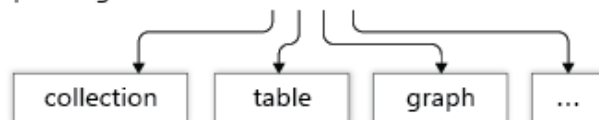


COMPONENTS



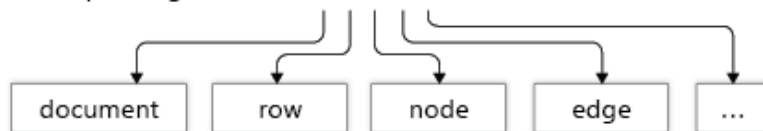
① { Container }s

Depending on the Cosmos API, a container is realized as:

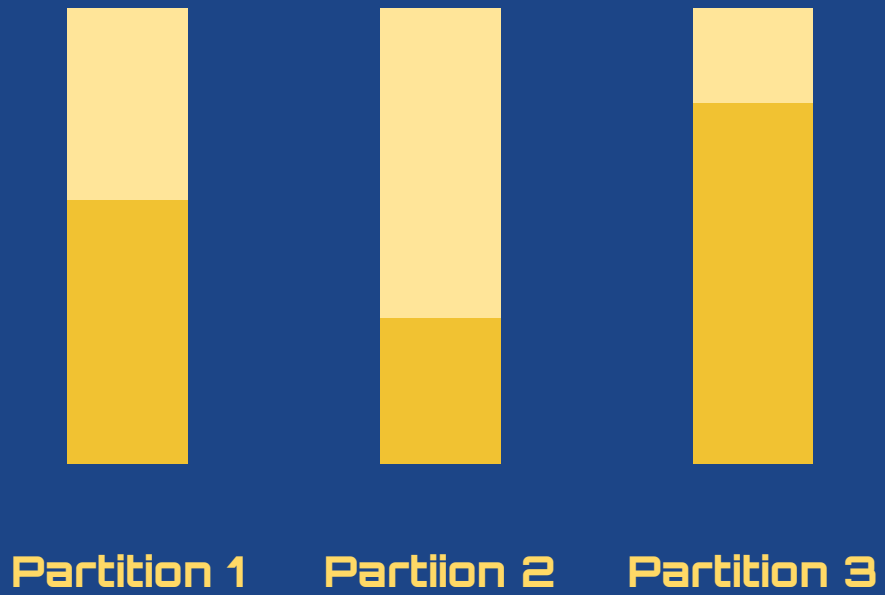


② { item}s

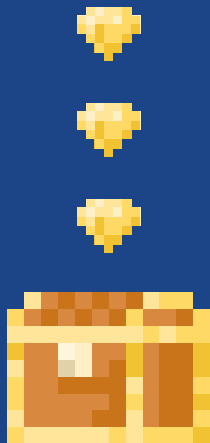
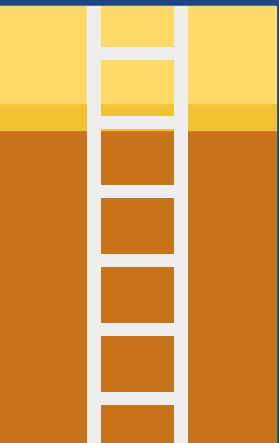
Depending on the Cosmos API, an item is realized as:



└─ PARTITIONING ─┘



REQUEST UNITS



Complexity

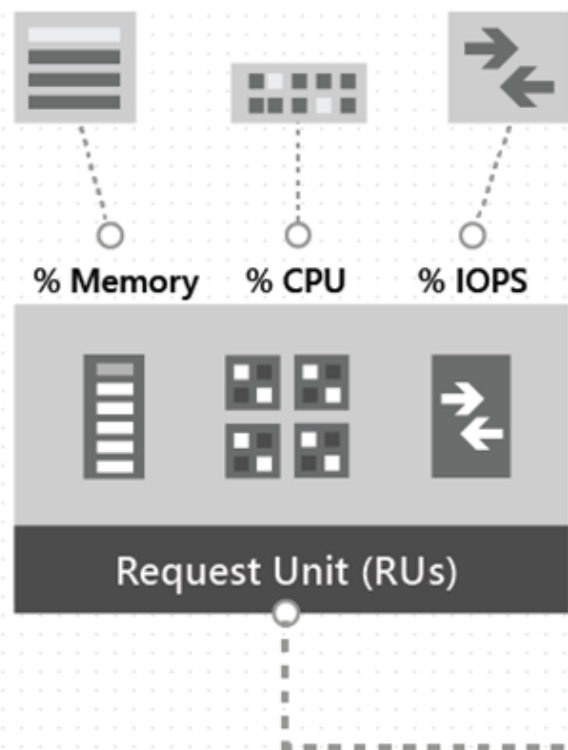
A combination of the Memory, CPU and IO required to perform an operation



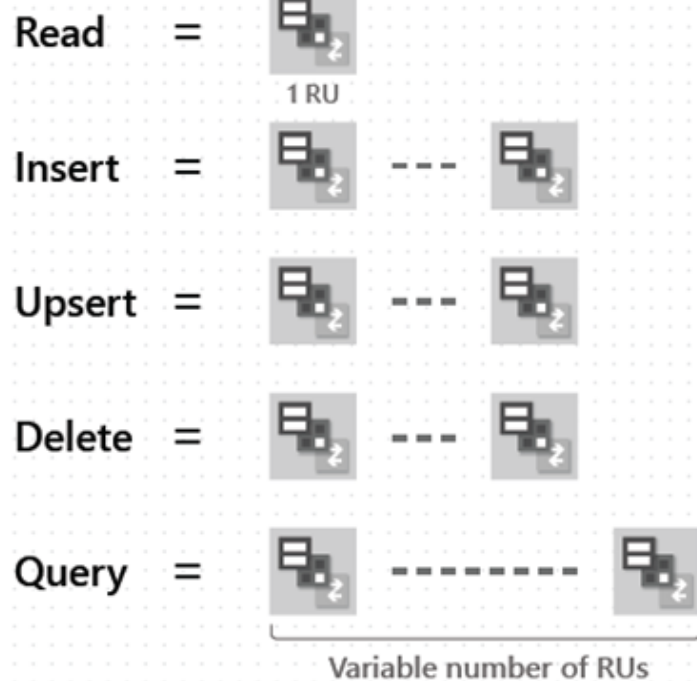
Cost

They represent a cost per operation or provision throughput

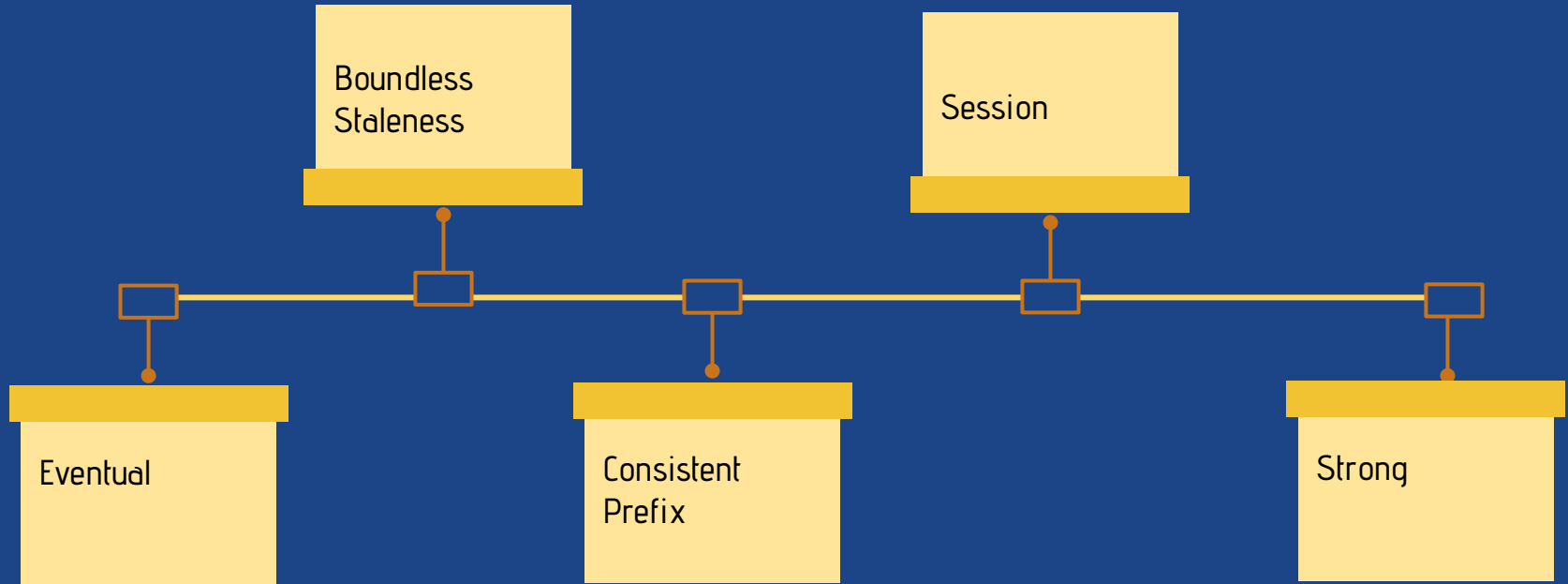
Usage is expressed in Request Units



Database operations consume a variable number of RUs



▶ CONSISTENCY MODELS ◀





SCALING



Serverless

Only charged for RU's you consume. Useful for irregular access patterns and low traffic applications



Provisioned

Reserved Capacity for at a database or container level. You can increase throughput at any point



Autopilot

Allows you scale your database or containers automatically based upon demand



OUR HERO



PERSONAL DATA

Developer MICROSOFT
Technology Database
Type NO SQL
Cost RU/s
Location WORLDWIDE



Abilities



Strengths

SLA's 99.999%

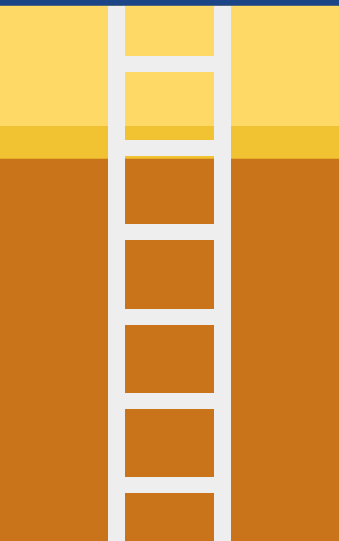
KEY SKILLS

- ✓ MULTIMODAL
- ✓ Flexible Consistency models
- ✓ Planet Scale



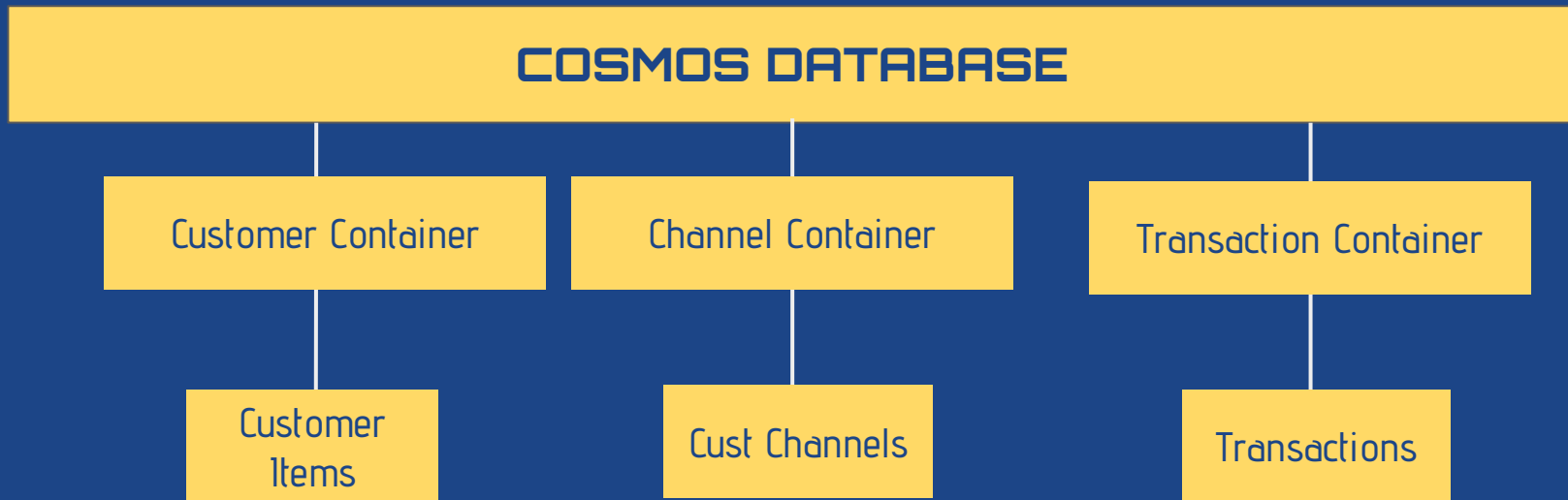
03

WHEN TO USE IT?



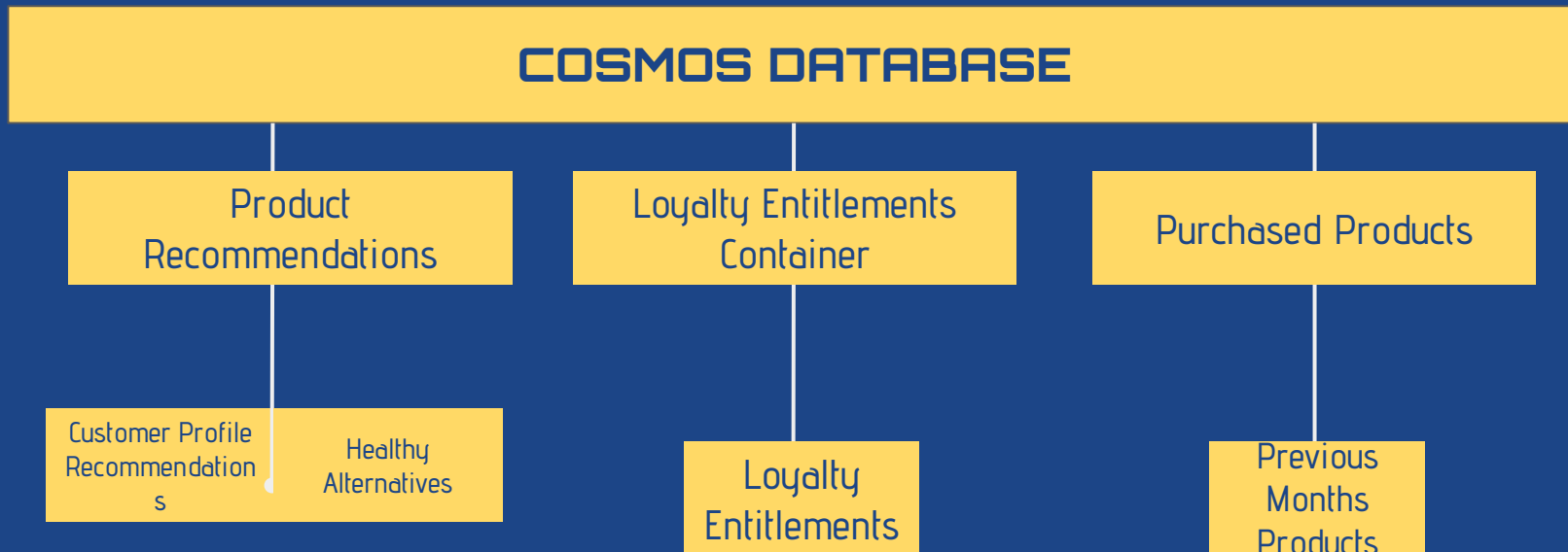


EXAMPLE





EXAMPLE 2





04

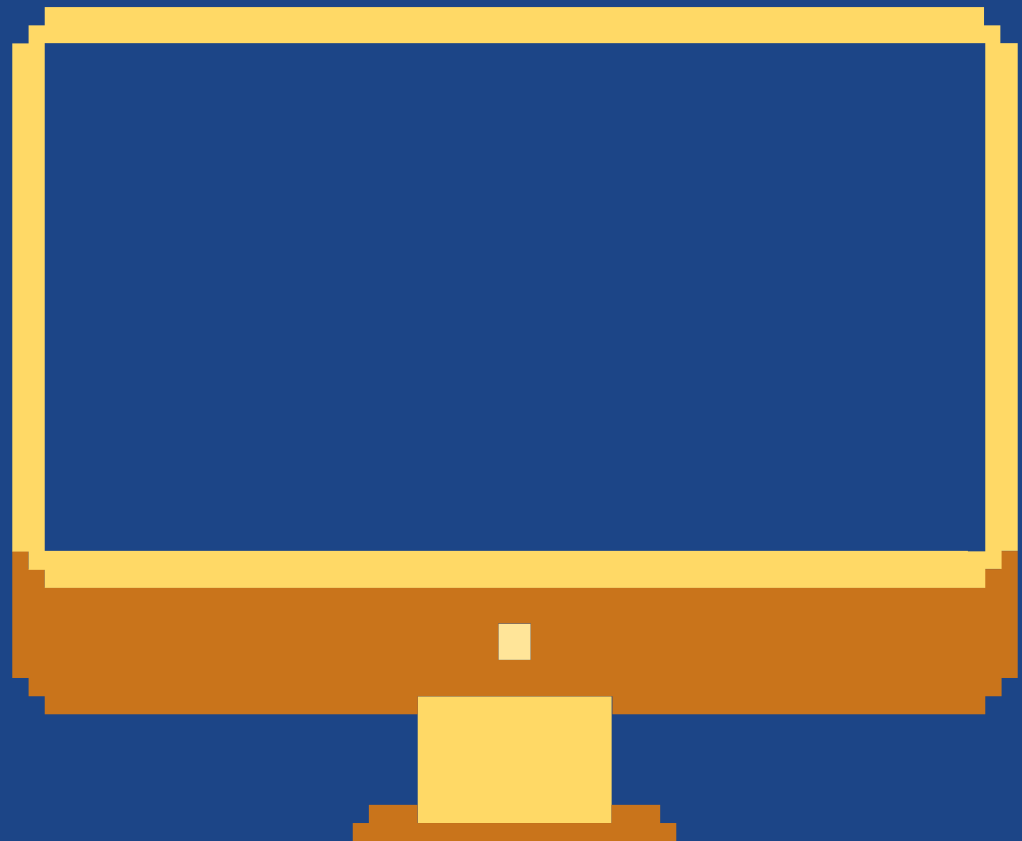
LET'S BUILD

The Final Boss





DEMO TIME



└ THINGS WE DIDN'T COVER ─

TIME TO LIVE - <https://docs.microsoft.com/en-us/azure/cosmos-db/sql/how-to-time-to-live#:~:text=%20Use%20the%20following%20steps%20to%20enable%20time,want%20to%20set%20time%20to%20live%2C...%20More%20>

CHANGE FEED - <https://docs.microsoft.com/en-us/azure/cosmos-db/change-feed#:~:text=%20Features%20of%20change%20feed%20%201%20Change,to%20an%20item%20appears%20exactly%20o...%20See%20More>.

ETAGS- <https://docs.microsoft.com/en-gb/azure/cosmos-db/account-databases-containers-items>



USEFUL RESOURCES



COSMOS EMULATOR - <https://cosmos.azure.com/capacitycalculator/>

COSMOS COST PROFILER - <https://cosmos.azure.com/capacitycalculator/>

Choose your Scale Model - <https://docs.microsoft.com/en-gb/azure/cosmos-db/how-to-choose-offer>

THANKS!

Do you have any questions?

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www.myyearindata.com

Feedback Link <https://sqlb.it/?7041>



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Azure Cosmos DB

Microsoft



Azure Cosmos DB

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Microsoft

★ 3.6 (668 Azure ratings)

Plan

Azure Cosmos DB

Create

Overview

Plans

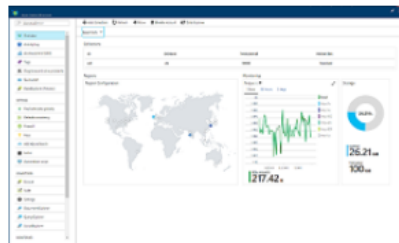
Usage Information + Support

Reviews

Azure Cosmos DB is a fully managed, globally-distributed, horizontally scalable in storage and throughput, multi-model database service backed up by comprehensive SLAs. Azure Cosmos DB was built from the ground up with global distribution and horizontal scale at its core – it offers turn-key global distribution across any number of Azure regions by transparently scaling and replicating your data wherever your users are. You can elastically scale throughput and storage worldwide and pay only for the throughput and storage you need. Cosmos DB guarantees single-digit millisecond latencies at the 99th percentile anywhere in the world, offers multiple well-defined consistency models to fine-tune for performance and guaranteed high availability with multi-homing capabilities – all backed by industry leading service level agreements (SLAs).

Cosmos DB is truly schema-agnostic – it automatically indexes all the data without requiring you to deal with schema and index management. Cosmos DB is multi-model – it natively supports document, key-value, graph and columnar data models. With Cosmos DB, you can access your data using the APIs of your choice. Cosmos DB is a fully managed, enterprise ready and trustworthy service. All your data is fully and transparently encrypted and secure by default. Cosmos DB is ISO, FedRAMP, EU, HIPAA, and PCI compliant as well.

Media



Select API option ...

Which API best suits your workload?

Azure Cosmos DB is a fully managed NoSQL database service for building scalable, high performance applications. [Learn more](#)

To start, select the API to create a new account. The API selection cannot be changed after account creation.

Core (SQL) - Recommended

Azure Cosmos DB's core, or native API for working with documents. Supports fast, flexible development with familiar SQL query language and client libraries for .NET, JavaScript, Python, and Java.

[Create](#)[Learn more](#)

Azure Cosmos DB API for MongoDB

Fully managed database service for apps written for MongoDB. Recommended if you have existing MongoDB workloads that you plan to migrate to Azure Cosmos DB.

[Create](#)[Learn more](#)

Cassandra

Fully managed Cassandra database service for apps written for Apache Cassandra. Recommended if you have existing Cassandra workloads that you plan to migrate to Azure Cosmos DB.

[Create](#)[Learn more](#)

Azure Table

Fully managed database service for apps written for Azure Table storage. Recommended if you have existing Azure Table storage workloads that you plan to migrate to Azure Cosmos DB, but do not want to re-write your application to use the SQL API.

[Create](#)[Learn more](#)

Gremlin (Graph)

Fully managed graph database service using the Gremlin query language, based on Apache TinkerPop project. Recommended for new workloads that need to store relationships between data.

[Create](#)[Learn more](#)

Create Azure Cosmos DB Account - Core (SQL) ...



Basics Global Distribution Networking Backup Policy Encryption Tags Review + create

Azure Cosmos DB is a fully managed NoSQL database service for building scalable, high performance applications. [Try it for free](#), for 30 days with unlimited renewals. Go to production starting at \$24/month per database, multiple containers included. [Learn more](#)

Project Details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription *

Resource Group * [Create new](#)

Instance Details

Account Name *

Location *

Capacity mode ⓘ ☒ Provisioned throughput ☐ Serverless
[Learn more about capacity mode](#)

With Azure Cosmos DB free tier, you will get the first 1000 RU/s and 25 GB of storage for free in an account. You can enable free tier on up to one account per subscription. Estimated \$64/month discount per account.

The subscription you have selected already has an account with free tier enabled.

Apply Free Tier Discount ☐ Apply ☒ Do Not Apply

Limit total account throughput ☐ Limit the total amount of throughput that can be provisioned on this account

i This limit will prevent unexpected charges related to provisioned throughput. You can update or remove this limit after your account is created.

Create Azure Cosmos DB Account - Core (SQL) ...

Basics Global Distribution Networking Backup Policy Encryption Tags Review + create

Global Distribution

Configure global distribution and regional settings for your account. You can also change these settings after the account is created.

Geo-Redundancy ⓘ **1** ☐ Enable ☒ Disable

Multi-region Writes ⓘ **2** ☐ Enable ☒ Disable


Create Azure Cosmos DB Account - Core (SQL) ...

✓ Validation Success

Basics Global Distribution Networking Backup Policy Encryption Tags Review + create

Creation Time

Estimated Account Creation Time (in minutes) 2

 The estimated creation time is calculated based on the location you have selected

Basics

Subscription	Visual Studio Enterprise – MPN
Resource Group	COSMOS101
Location	West US
Account Name	(new) shdhsdhsdh
API	Core (SQL)
Capacity mode	Provisioned throughput
Geo-Redundancy	Disable
Multi-region Writes	Disable

Backup Policy

Backup policy	Periodic
Backup storage redundancy	Geo-redundant backup storage

Networking

Connectivity method	All networks
---------------------	--------------

Create

Previous

Next

[Download a template for automation](#)



prod | Data Explorer

Azure Cosmos DB account



Search (Ctrl+ /)



New Container ▾



Enable Azure Synapse Link



New Notebook ▾



Connect



Overview



Activity log



Access control (IAM)



Tags



Diagnose and solve problems



Cost Management



Quick start



Notifications



Data Explorer

Settings

SQL API



DATA

ToDoList

Items



NOTEBOOKS

Notebooks is currently not available. We are working on it.

New Database

* Database id ⓘ

SQLBITSDEMO

☒ Provision throughput ⓘ

* Database throughput (autoscale) ⓘ

☒ Autoscale

☐ Manual

Estimate your required RU/s with [capacity calculator](#).

Database Max RU/s ⓘ

4000

Your database throughput will automatically scale from **400 RU/s**
(10% of max RU/s) - **4000 RU/s** based on usage.

Estimated monthly cost (USD) ⓘ: **\$35.04 - \$350.40** (1 region, 400 - 4000 RU/s, \$0.00012/RU)

OK

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