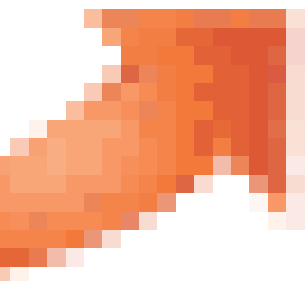
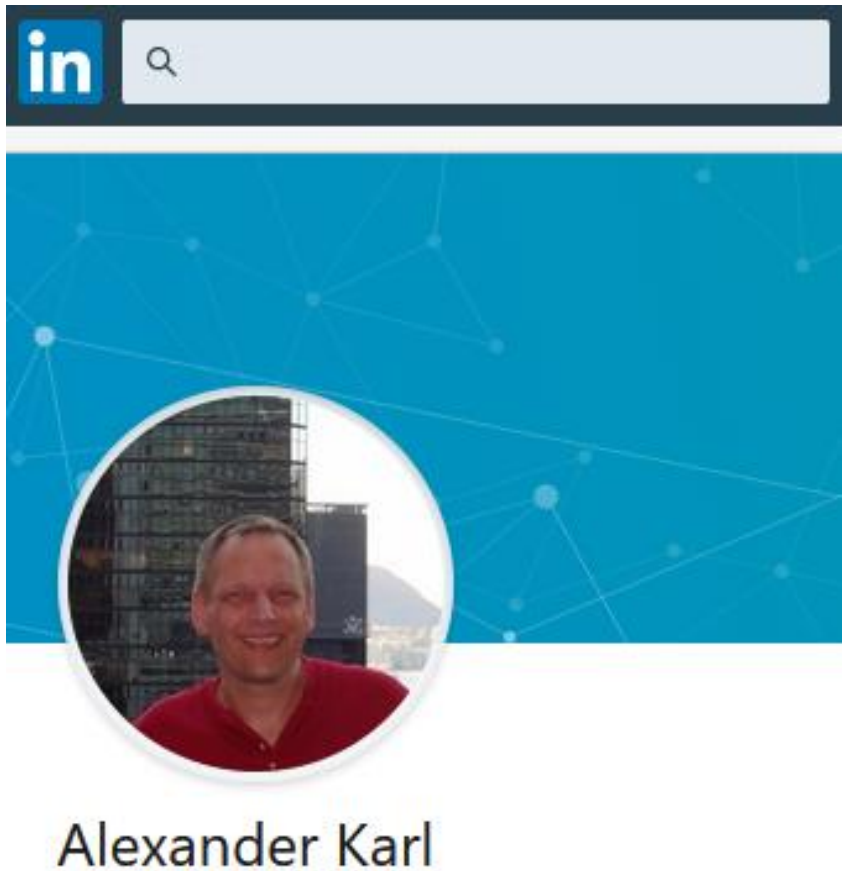
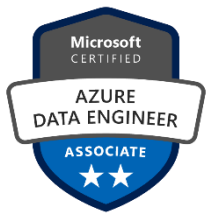
Cosmos DB

get started with NoSQL on Azure



about me





https://www.linkedin.com/in/alexander-karl-44561012a/

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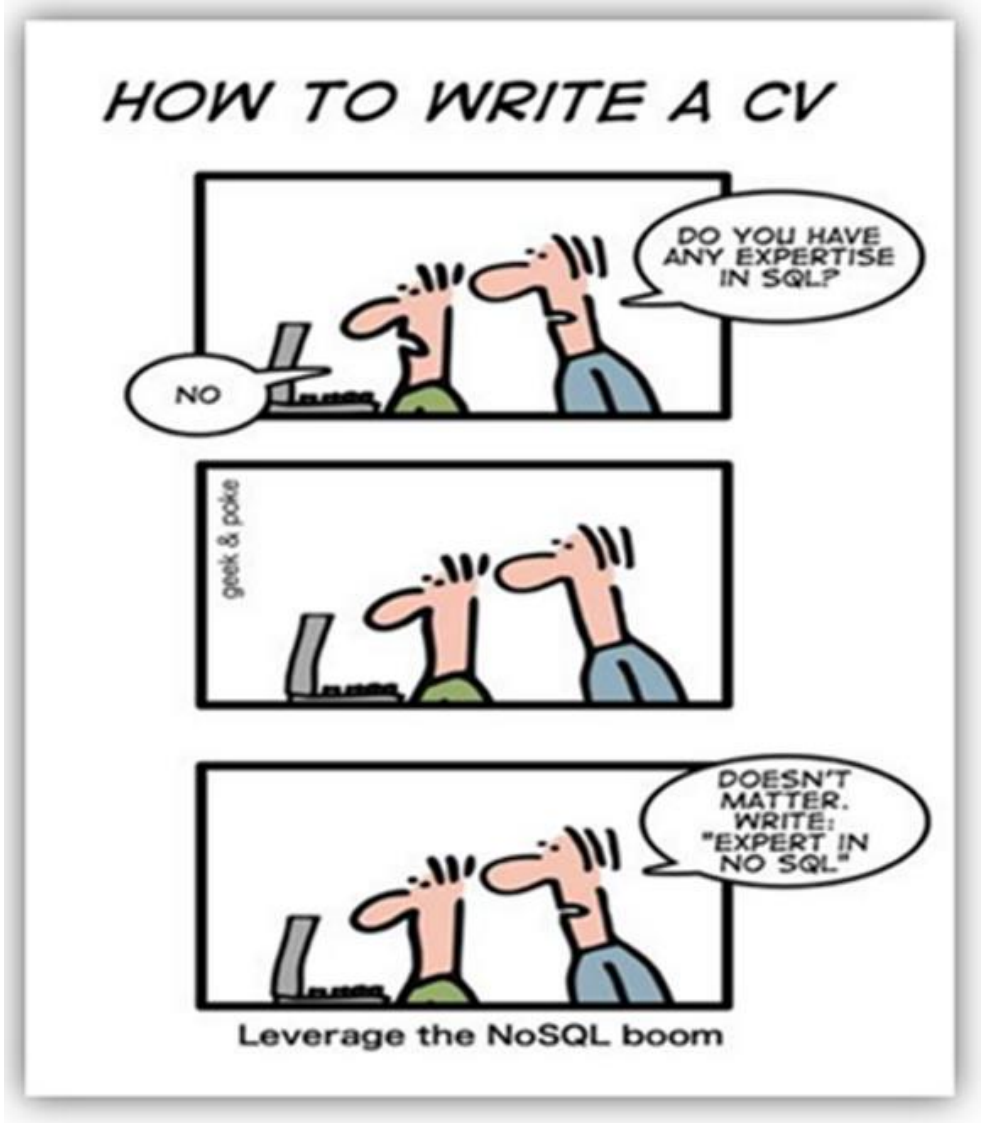
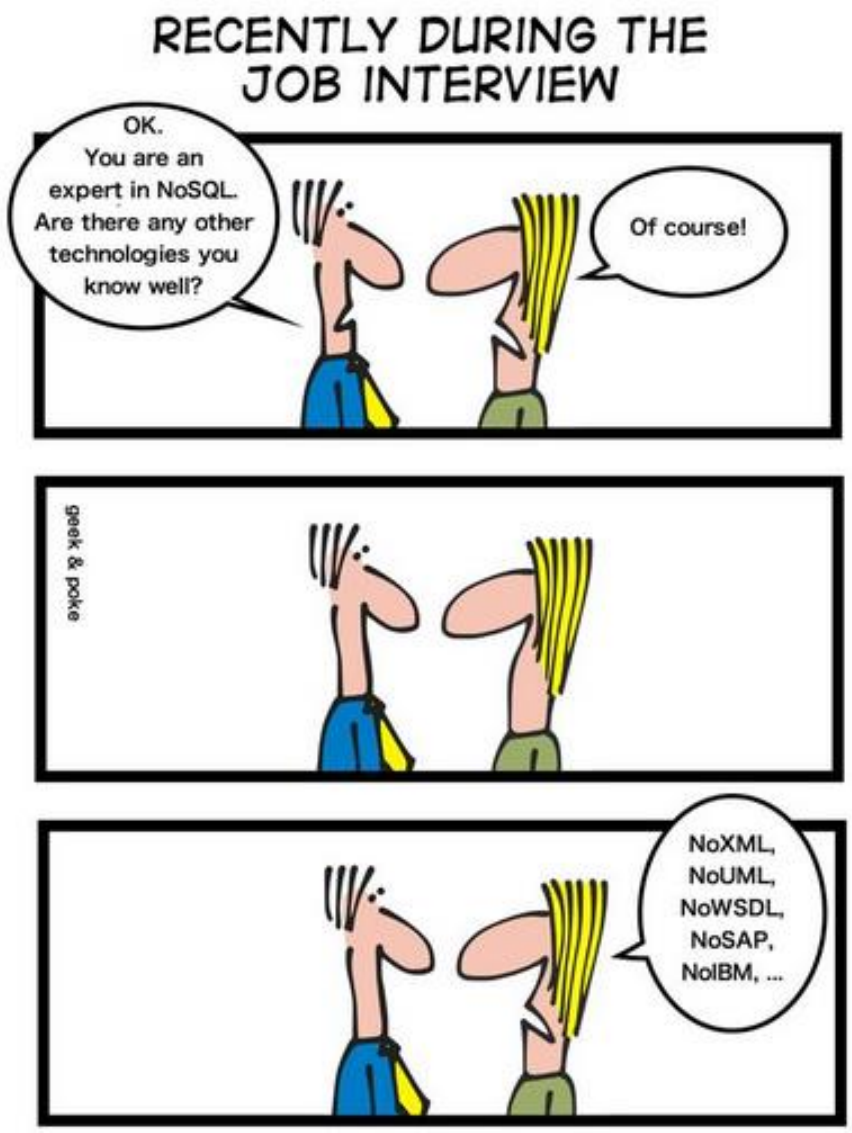
erste Berührungen ...



… und


RECENTLY DURING THE JOB INTERVIEW
OK. You are an expert in NoSQL. Are there any other technologies you know well?
Of course!
geek & poke
NoXML, NoUML, NoWSDL, NoSAP, NoIBM, ...

ernsthafte Berührungen …

Data Pipeline: The simplified data pipeline for this initiative is as shown in *Figure* 5.10:

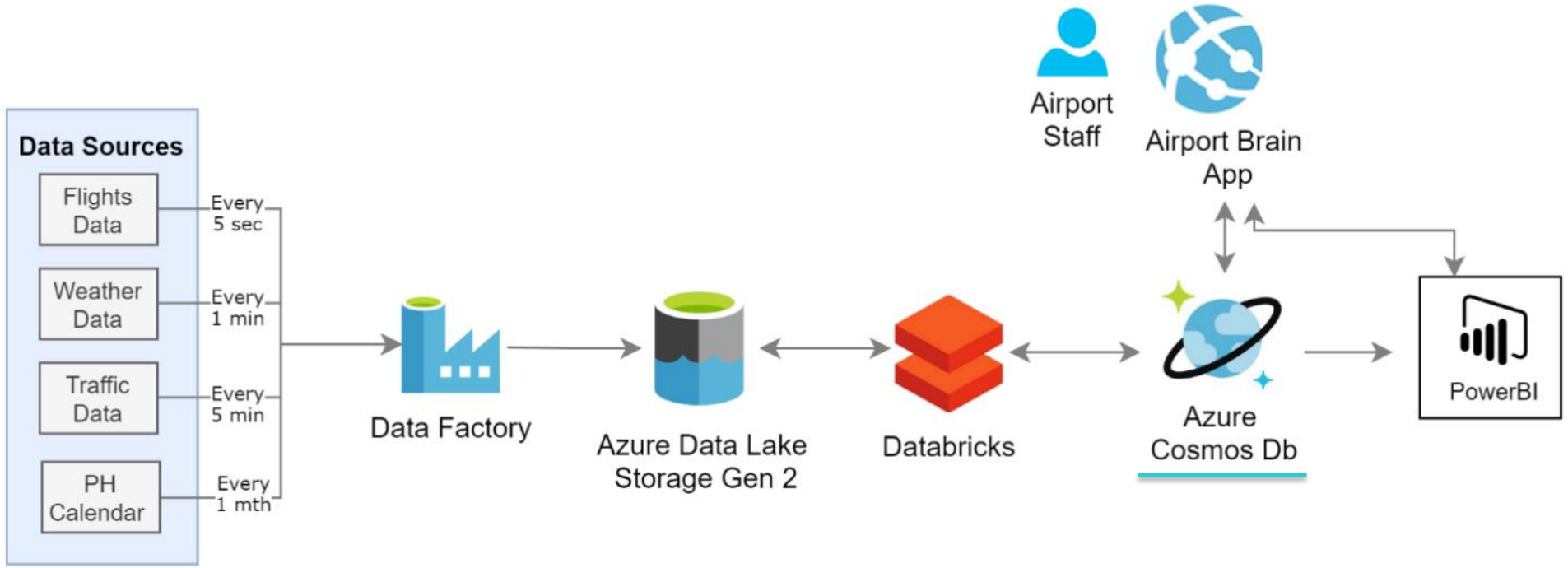


Figure 5.10: Data pipeline for initiative 2

Buch: Cloud_Analytics_with_Microsoft_Azure

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… und

https://www.youtube.com/watch?v=WCY3KU8XrmY

Agenda:

NoSQL vs. RDBMS

Provision Cosmos DB

Demo Import & Query

NoSQL vs. Relational DBMS

Vereinfachte Anwendungsentwicklung

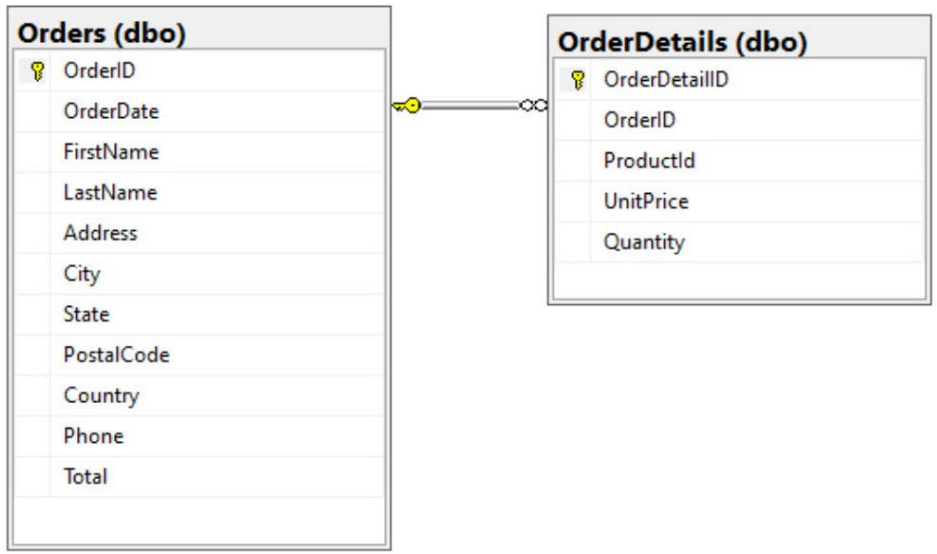
- schemalose Daten
- Open-Source-APIs
- mehrere SDKs

https://docs.microsoft.com/de-de/azure/cosmos-db/relational-nosql

https://docs.microsoft.com/de-de/azure/cosmos-db/introduction

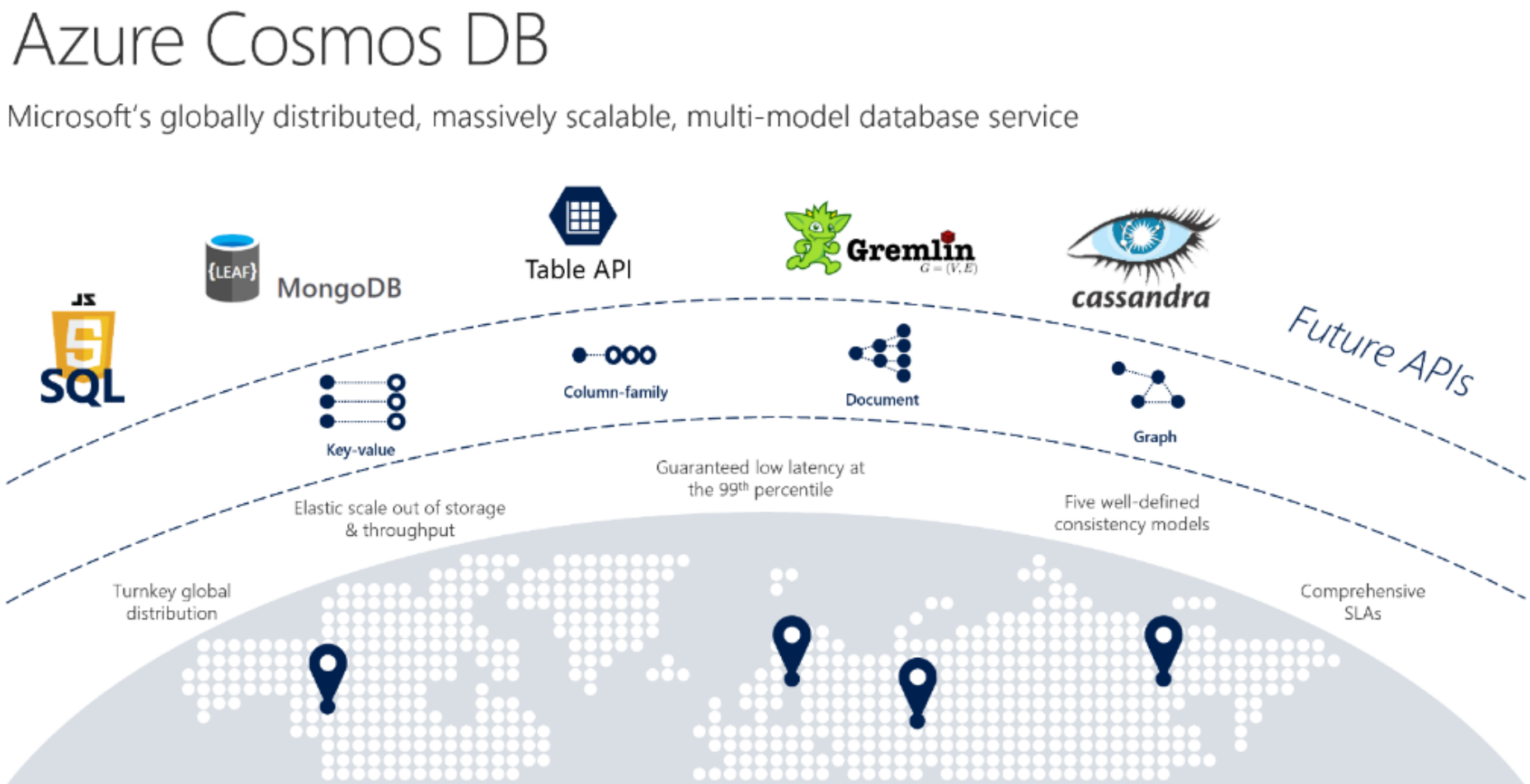
NoSQL vs. Relational DBMS


```
{
    "OrderId": 1,
    "OrderDate": 1574161910220,
    "FirstName": "John",
    "LastName": "Smith",
    "Address": "10 Street",
    "City": "City",
    "State": "VA",
    "OrderDetails": [
        {
            "UnitPrice": 7.99,
            "OrderDetailId": 2,
            "Quantity": 1,
            "ProductId": 259694,
            "OrderId": 1
        },
        {
            "UnitPrice": 7.99,
            "OrderDetailId": 3,
            "Quantity": 1,
            "ProductId": 295693,
            "OrderId": 1
        }
    ],
    "id": "795c50dc-1a83-11ea-bf07-00163ee85f66",
    "_rid": "VdgtAK23OMANAAAAAAAAAA==",
    "_self": "dbs/VdgtAA==/colls/VdgtAK23OMA=/docs/VdgtAK23OMANAAAAAAAAAA==/",
    "_etag": "\"370017e1-0000-1100-0000-5df770f20000\"",
    "_attachments": "attachments/",
    "_ts": 1576497394
}
```

https://docs.microsoft.com/de-de/azure/cosmos-db/relational-nosql

5 different APIs



https://azure.microsoft.com/de-de/blog/azure-cosmos-db-database-for-intelligent-cloud-intelligent-edge-era/

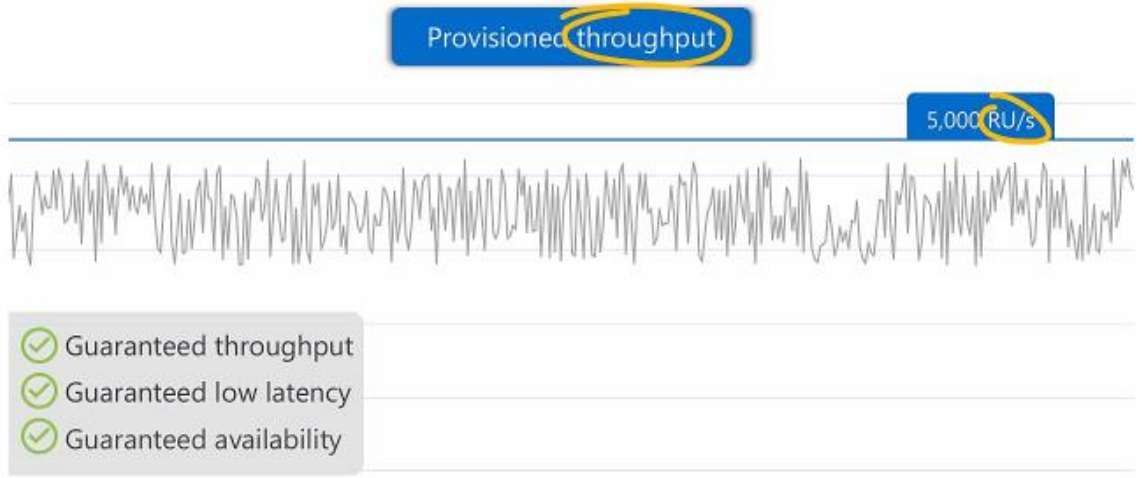
Capacity mode

Provisioned

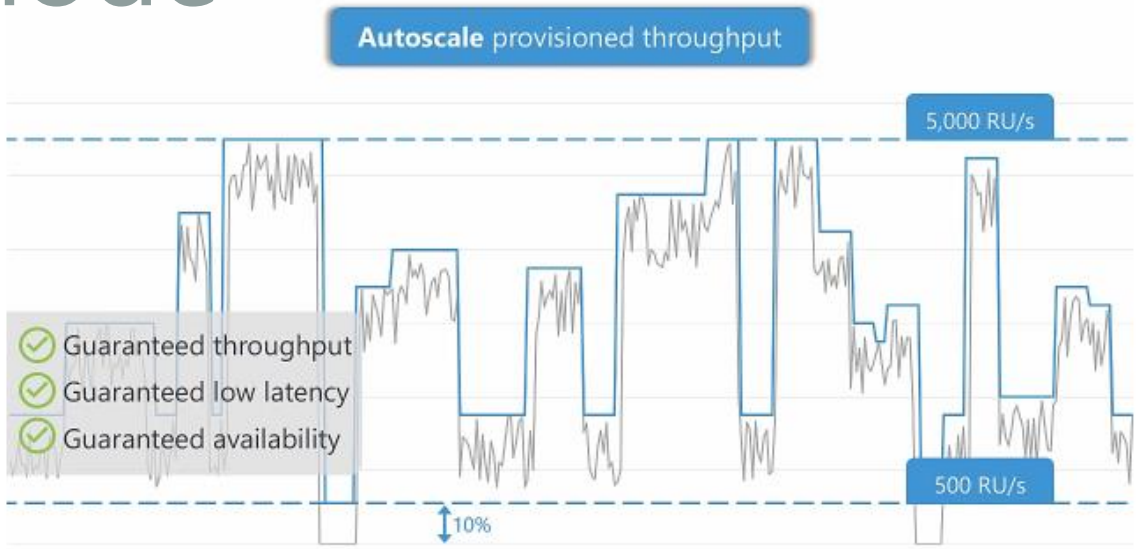
- Standard
- Autoscale

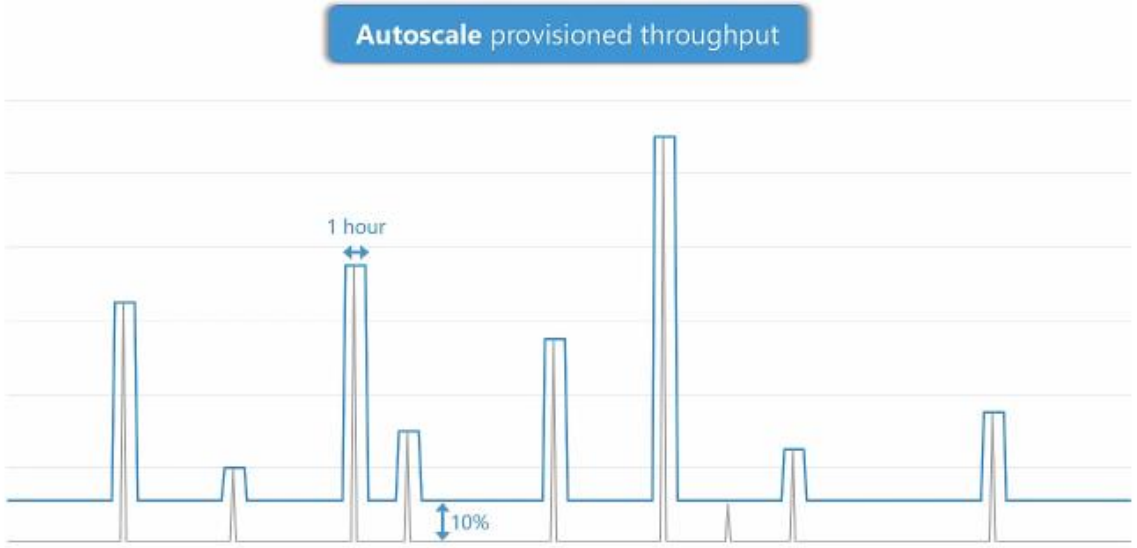
Serverless

Capacity mode

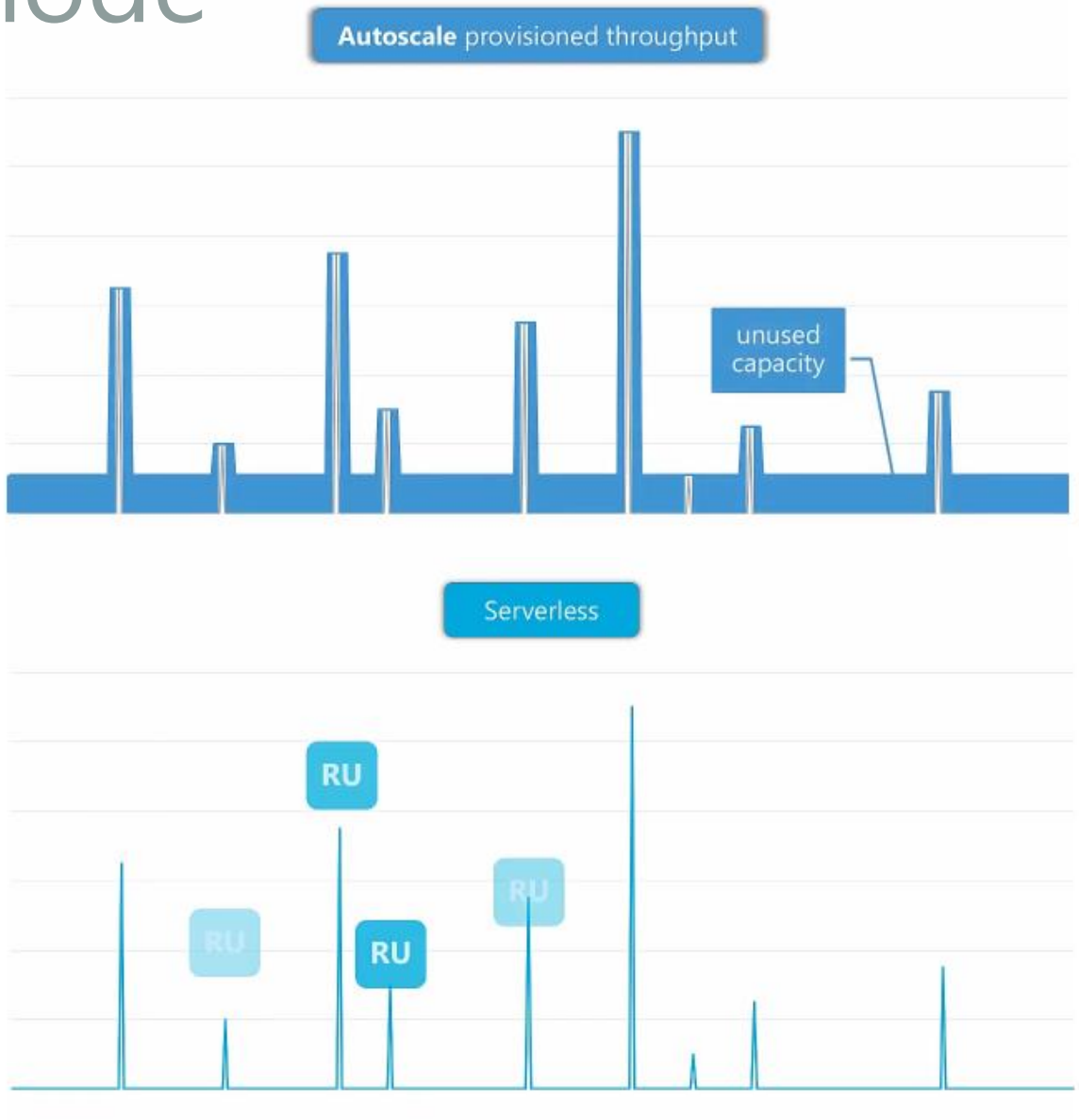


Capacity mode





Capacity mode



Capacity mode

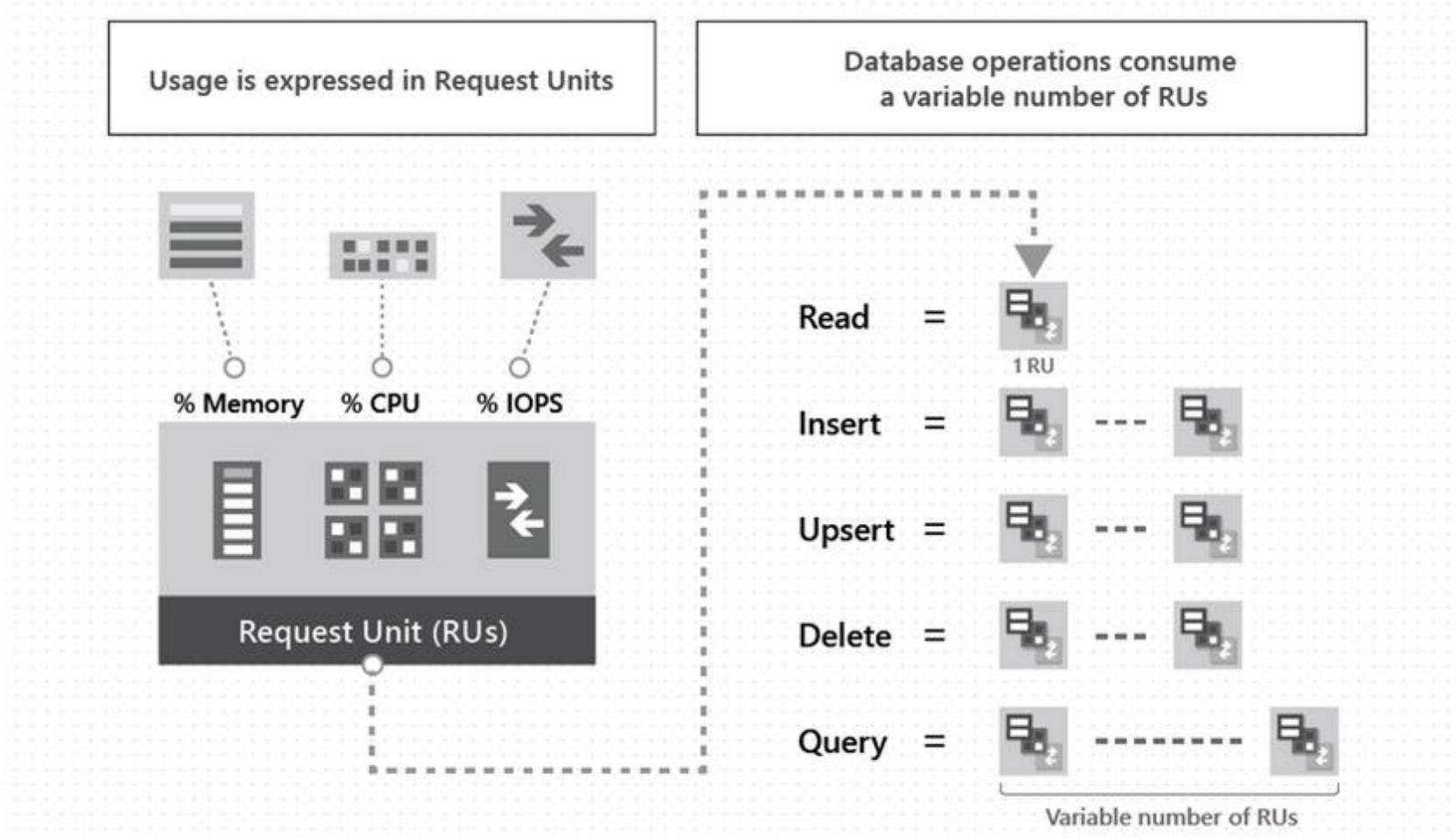
Provisioned

- Standard
- Autoscale

Serverless

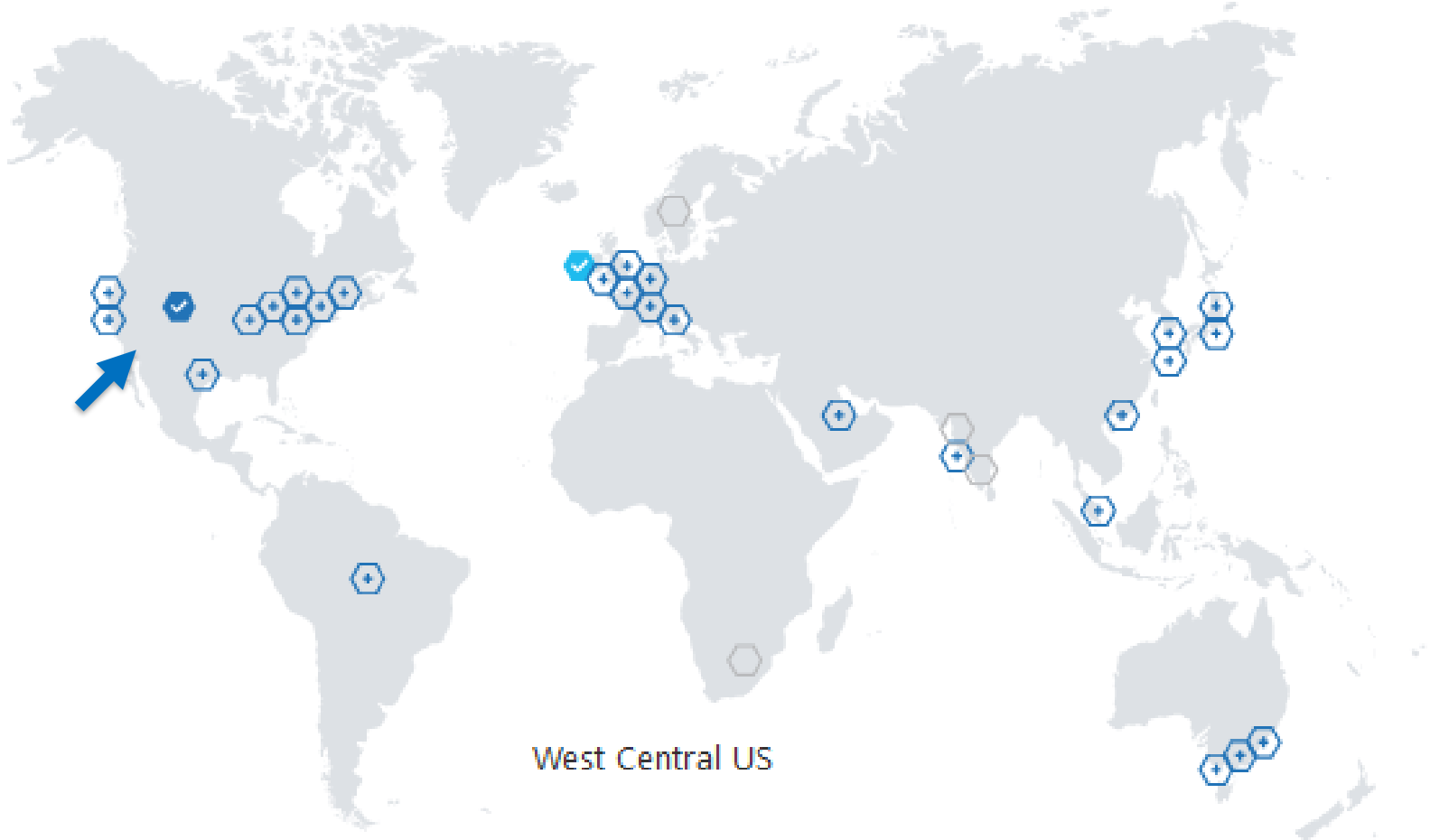
https://docs.microsoft.com/de-de/azure/cosmos-db/throughput-server

Request-Units RU

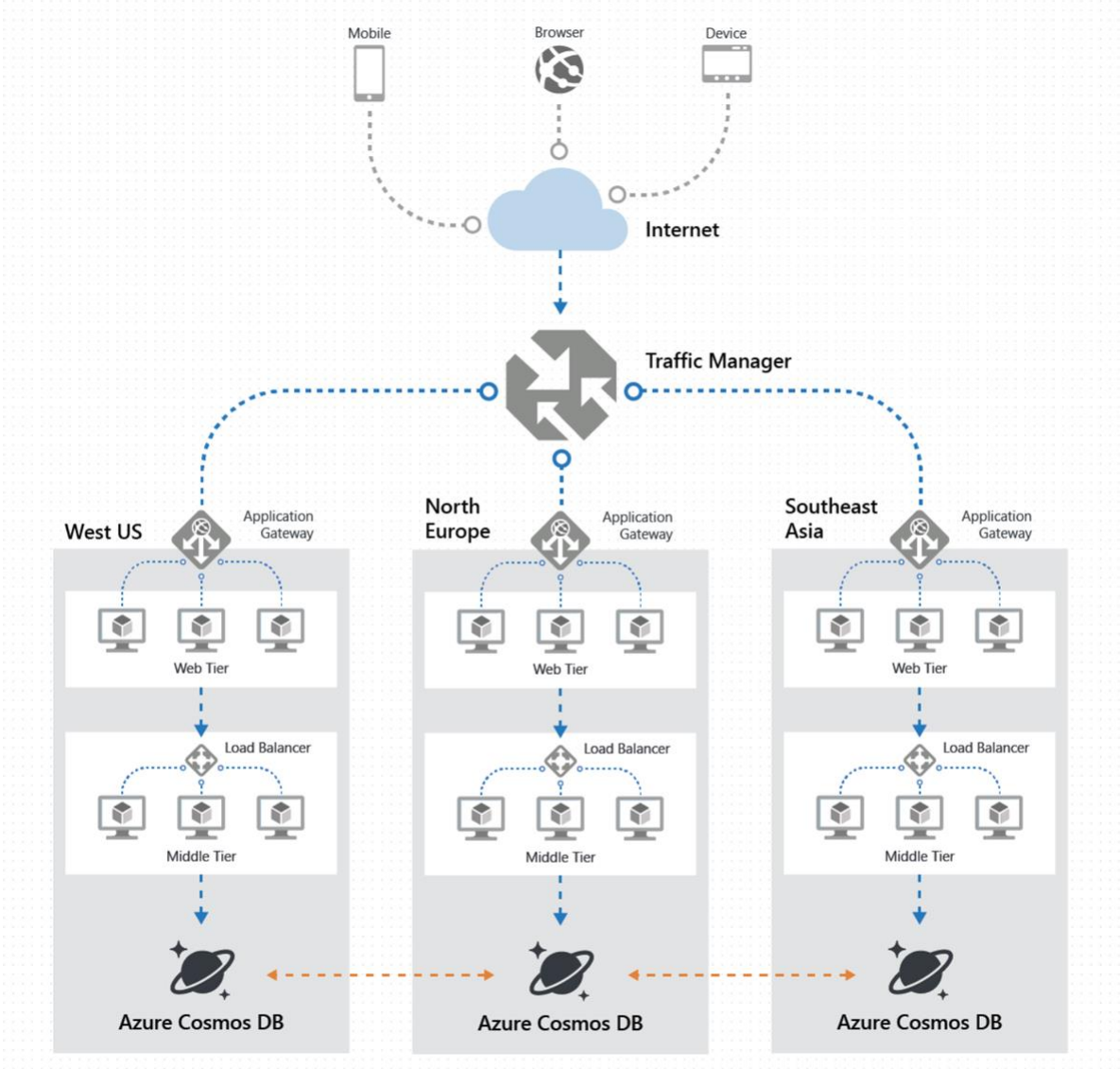


https://docs.microsoft.com/de-de/azure/cosmos-db/request-units

Replicate data globally

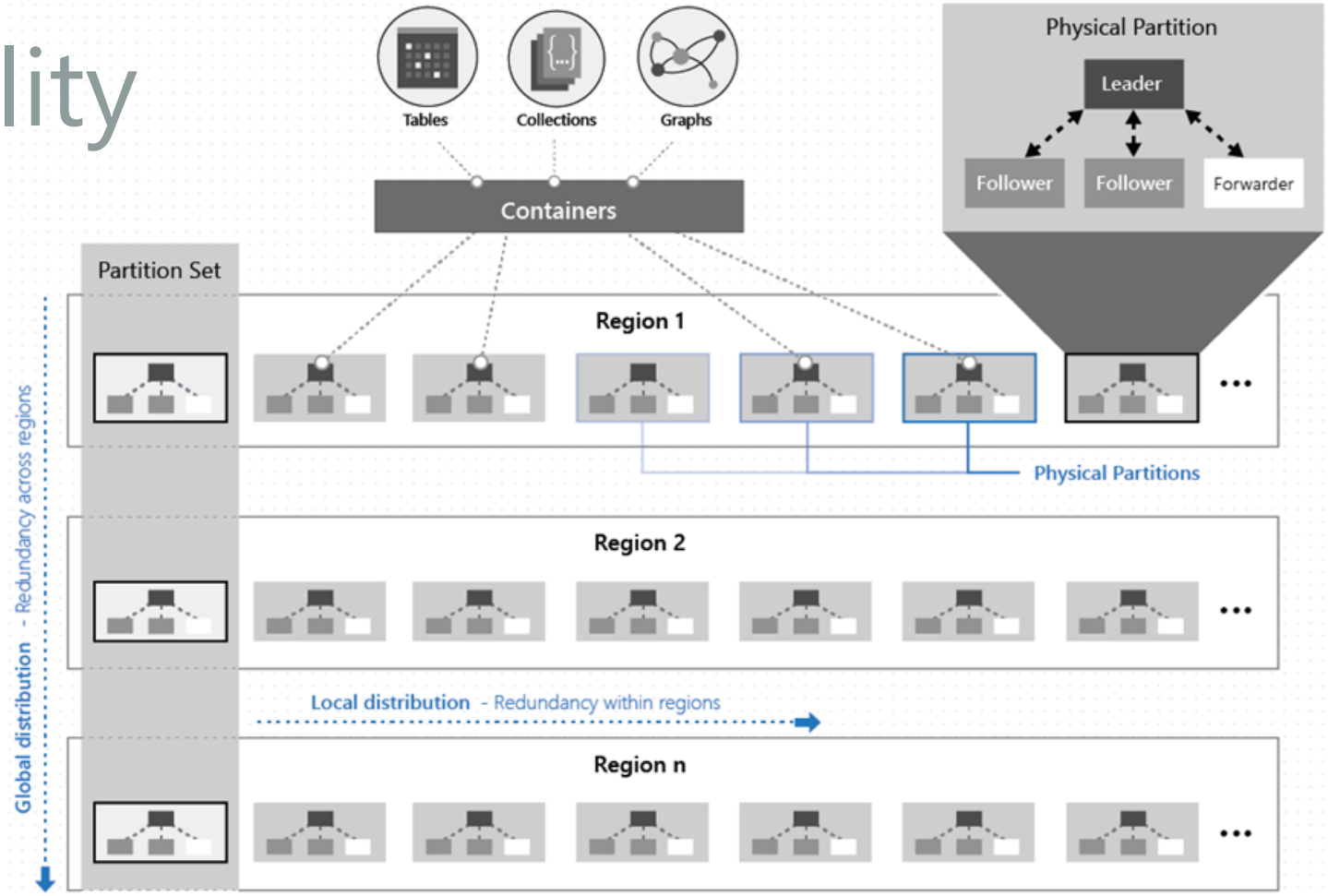


Distribute data globally



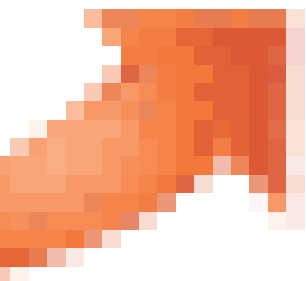
https://docs.microsoft.com/de-de/azure/cosmos-db/distribute-data-globally

High availability

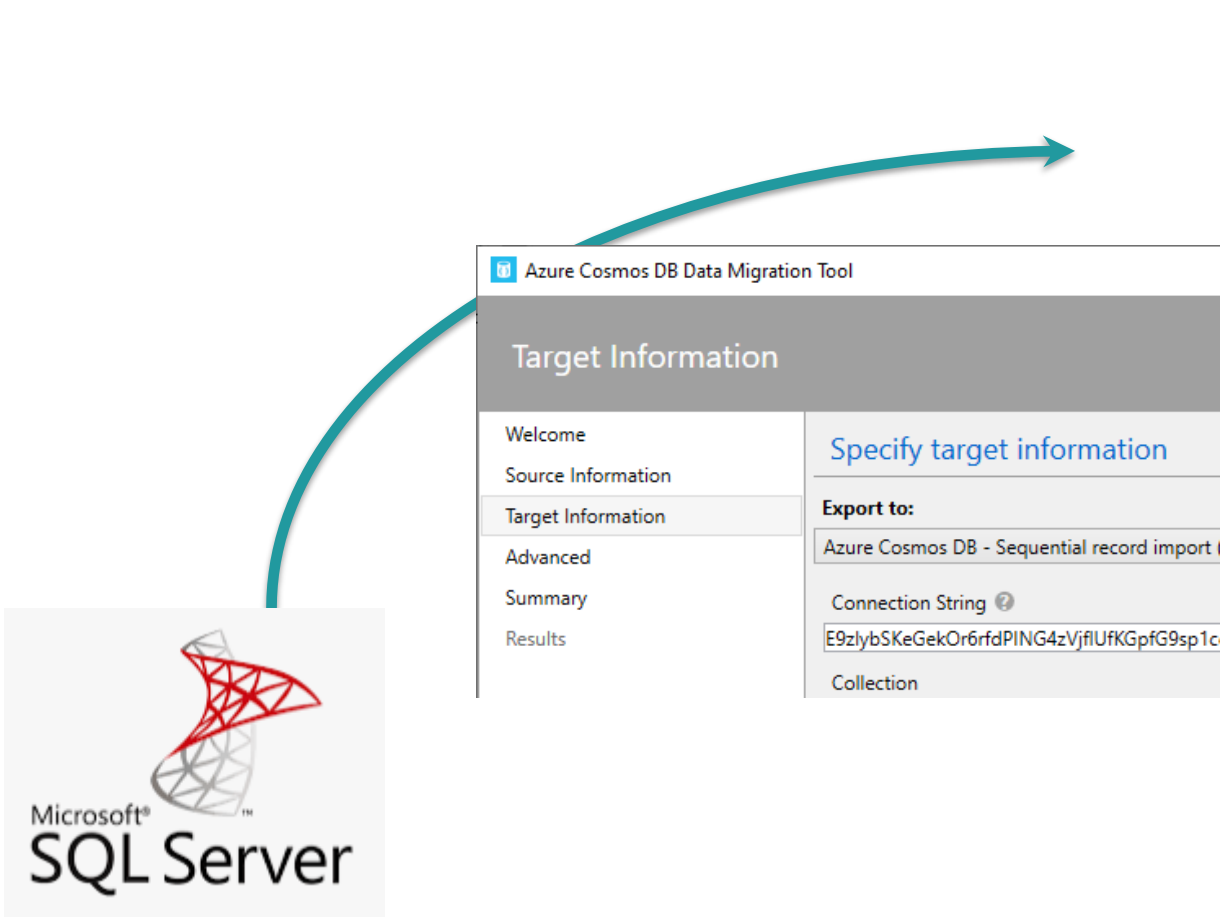


https://docs.microsoft.com/de-de/azure/cosmos-db/high-availability

Demo



Demo

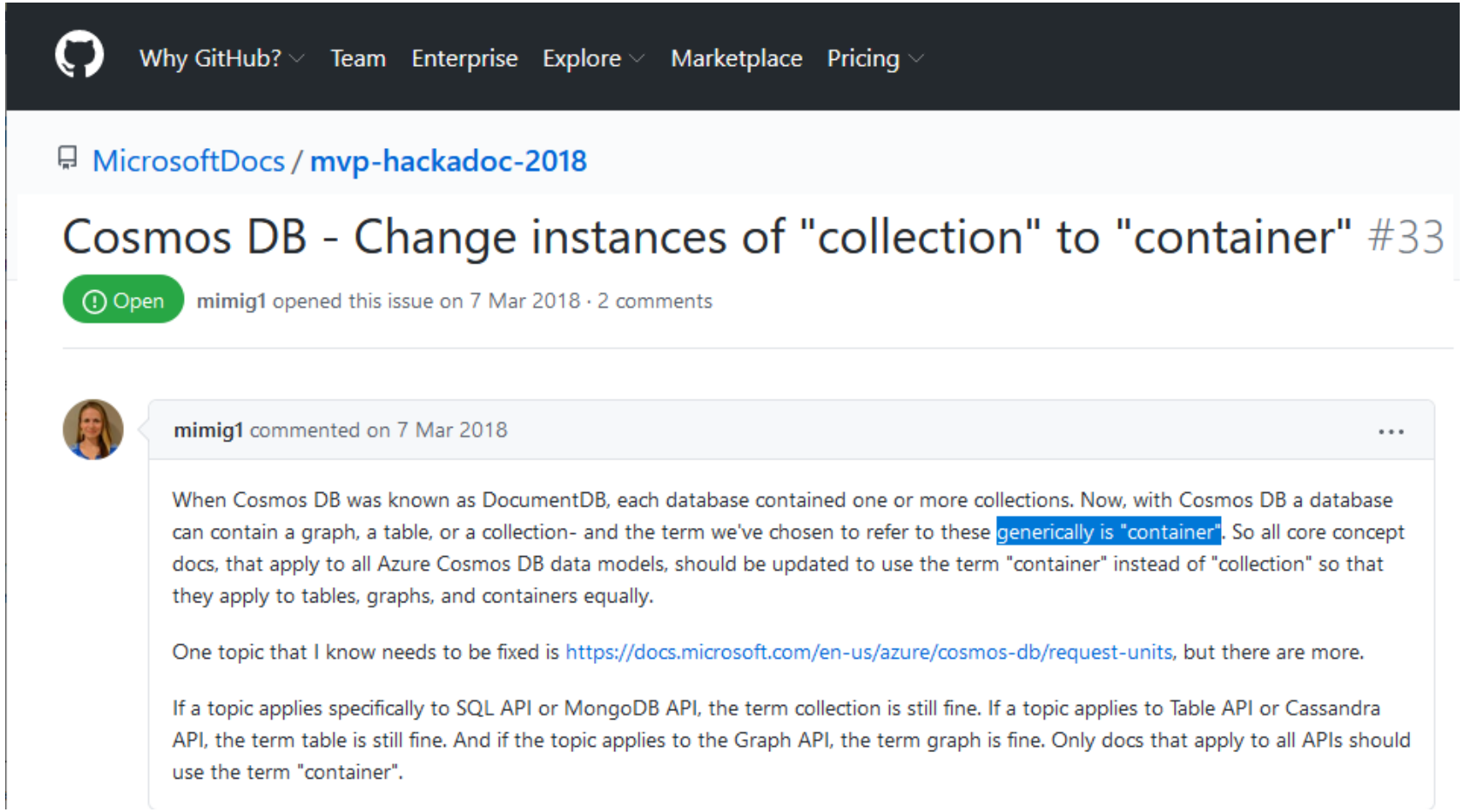

Azure Cosmos DB Data Migration Tool
Target Information
Welcome
Source Information
Target Information
Advanced
Summary
Results
Specify target information
Export to:
Azure Cosmos DB - Sequential record import
Connection String
Collection
Microsoft
SQL Server
Power BI Desktop

Comparing NoSQL vs. RDBMS

Document Database	**Relational Database**
Collections	Tables
Properties	Columns
Documents	Rows
Denormalized	Normalized
Schema-less	Declarative Schema
No referential integrity	Referentail integrity

https://docs.microsoft.com/de-de/azure/cosmos-db/account-databases-containers-items

„Collections“ and „Containers“



https://github.com/MicrosoftDocs/mvp-hackadoc-2018/issues/33

System properties

```
{
    "id": "1",
    "_rid": "9cN4ALEU-KcCAAAAAAAAAA==",
    "_self": "dbs/9cN4AA==/colls/9cN4ALEU-Kc=/docs/9cN4ALEU-KcCAAAAAAAAAA==/",
    "_etag": "\"0200b17e-0000-0c00-0000-600f46240000\"",
    "_attachments": "attachments/",
    "_ts": 1611613732
}
```

_rid = „Container ID“

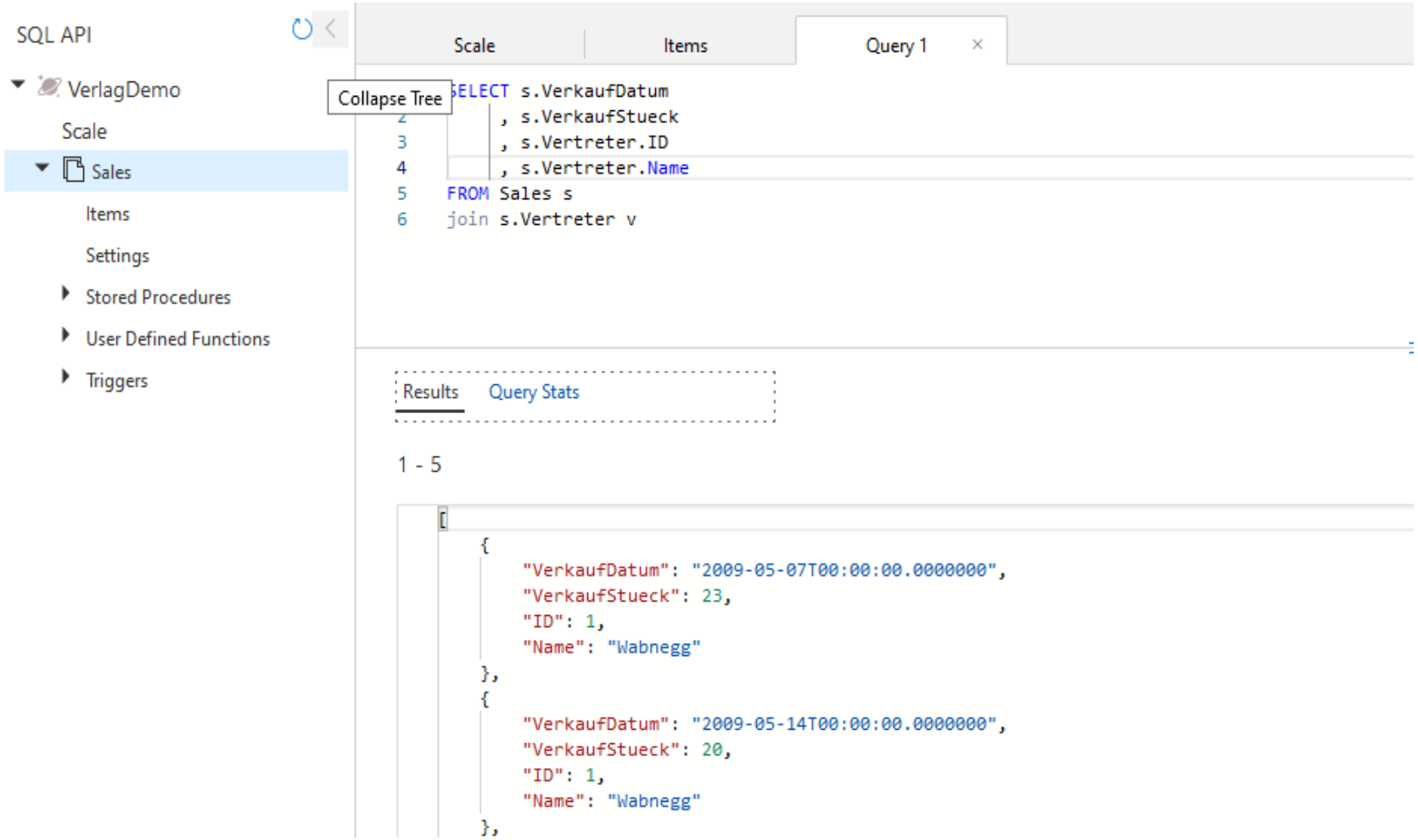
_self = „individual address“

_etag = „unique identifier“

_ts = „timestamp“ since 1.1.1970

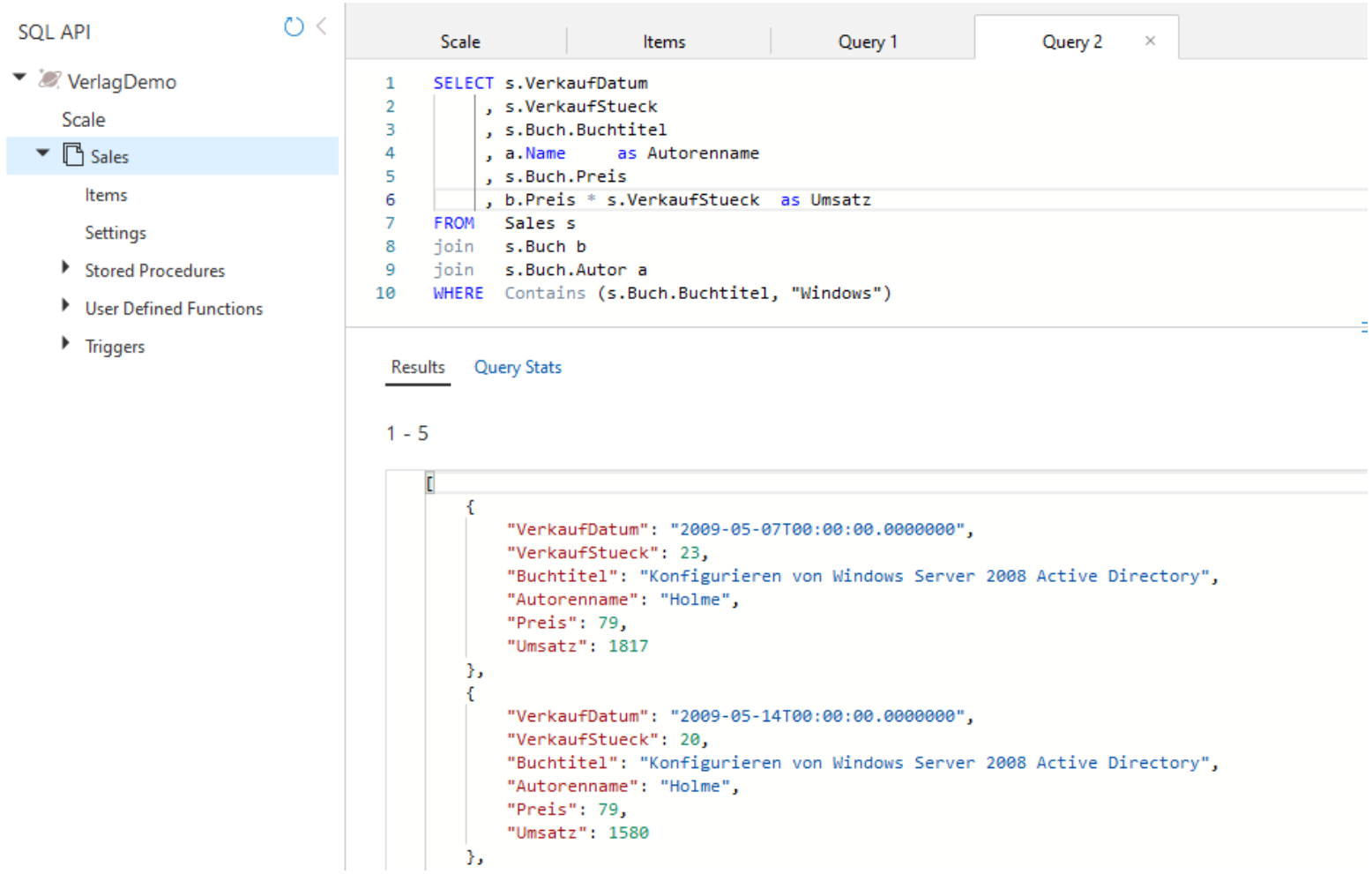
https://docs.microsoft.com/de-de/azure/cosmos-db/account-databases-containers-items

SQL Statements



https://docs.microsoft.com/de-de/azure/cosmos-db/sql-query-join

SQL Statements



Modeling data

Wann Sie einbetten sollten

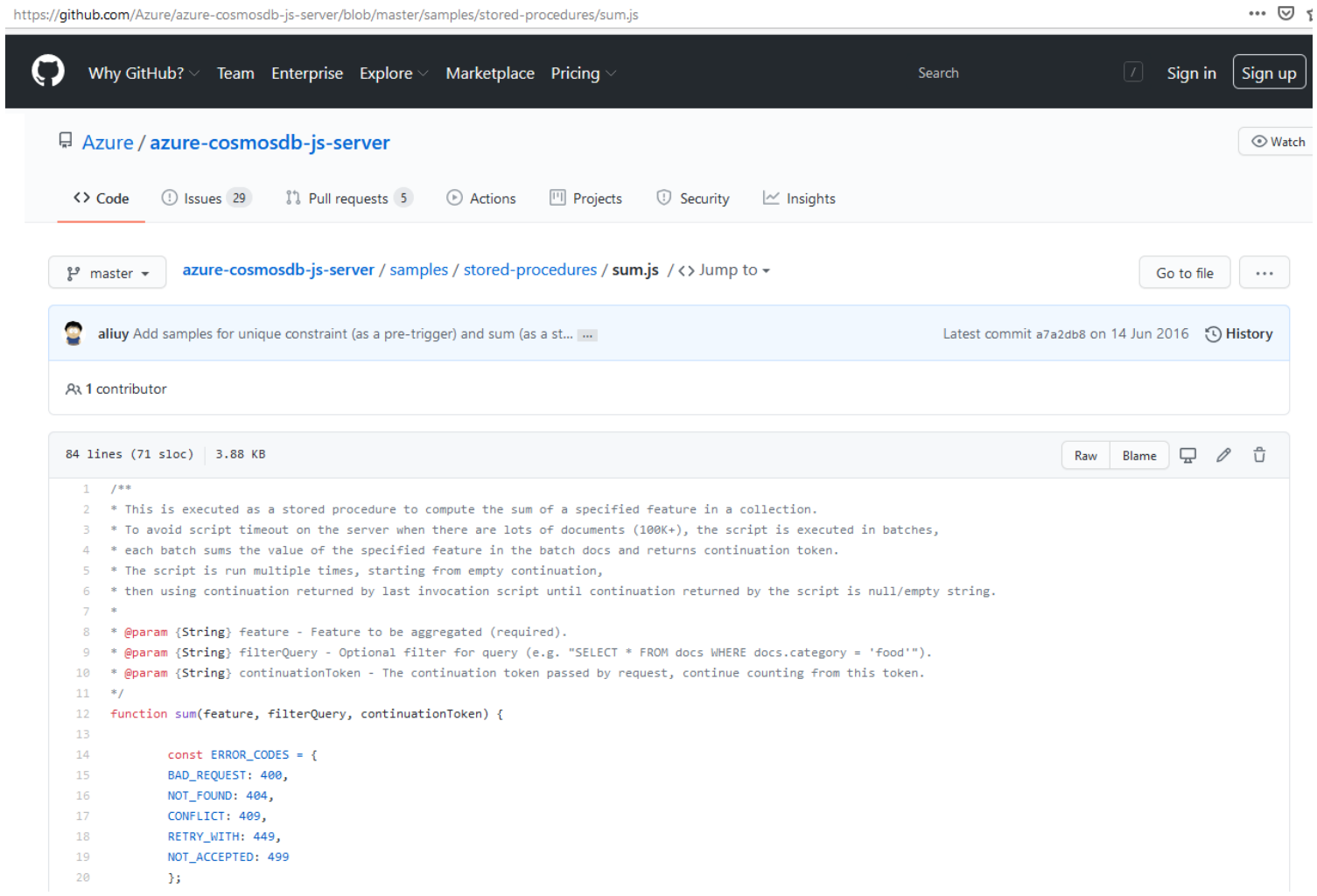
Verwenden Sie in der Regel eingebettete Datenmodelle in den folgenden Fällen:

- Zwischen Entitäten gibt es **contained** -Beziehungen.
- Zwischen Entitäten gibt es **eins-zu-viele** -Beziehungen.
- Es gibt eingebettete Daten, die sich **selten ändern**.
- Es gibt eingebettete Daten, die nicht **grenzenlos** wachsen.
- Es gibt eingebettete Daten, die **häufig gemeinsam abgefragt werden**.

> ⓘ **Hinweis**
>
> In der Regel bieten denormalisierte Datenmodelle eine bessere **Leseleistung** .

https://docs.microsoft.com/de-de/azure/cosmos-db/modeling-data

stored-procedures



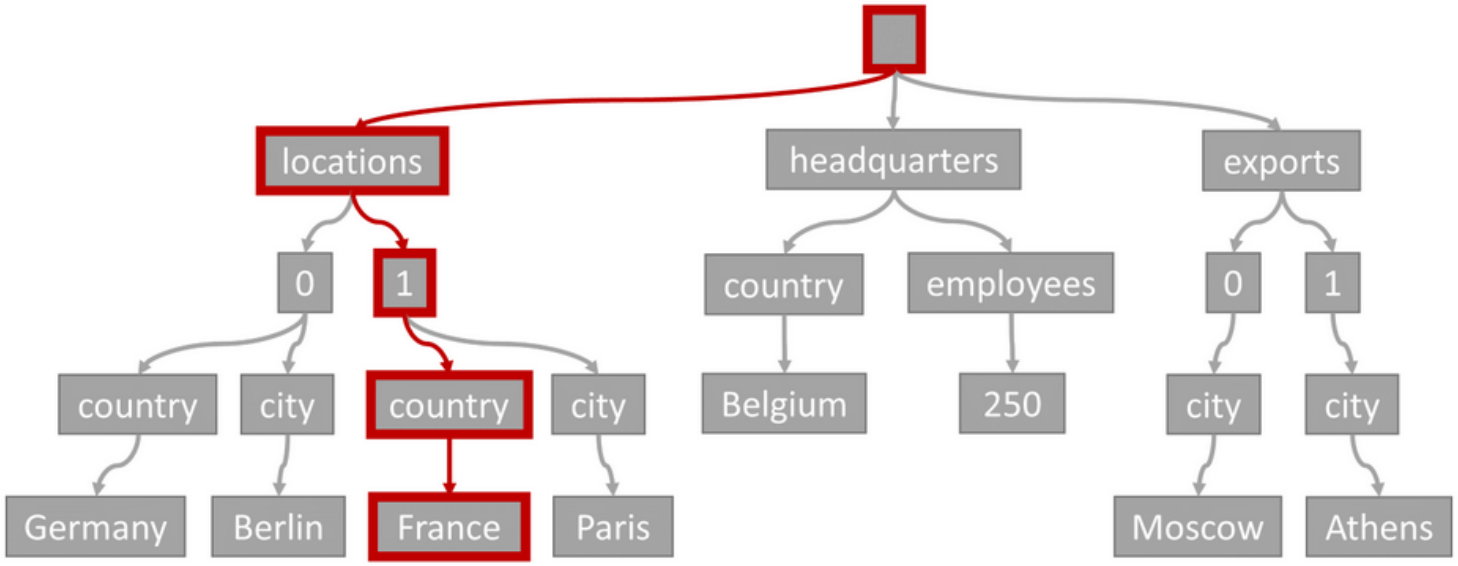
https://github.com/Azure/azure-cosmosdb-js-server/blob/master/samples/stored-procedures/sum.js

Index-overview

Abfragen mit Indizes

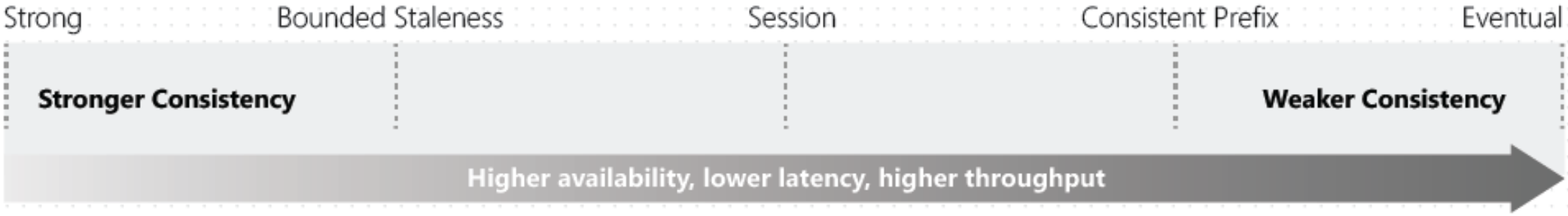
Die während der Indizierung der Daten extrahierten Pfade vereinfachen das Suchen im Index bei der Verarbeitung einer Abfrage. Durch einen Abgleich der `WHERE`-Klausel einer Abfrage mit der Liste der indizierten Pfade ist es möglich, sehr schnell die Elemente zu ermitteln, die dem Abfrageprädikat entsprechen.

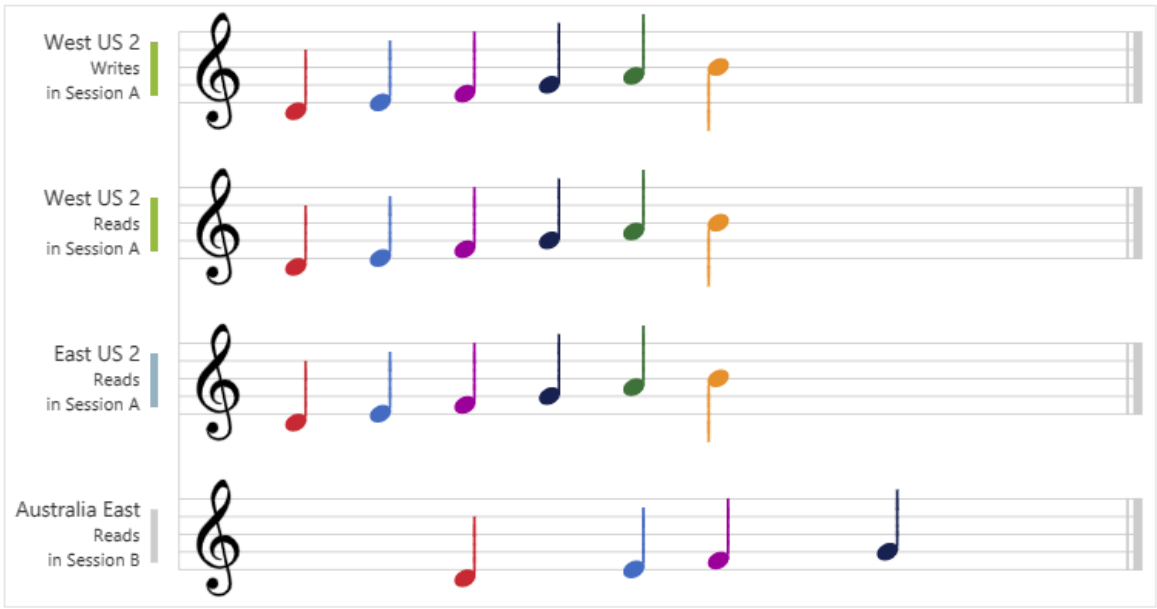
Betrachten Sie beispielsweise die folgende Abfrage: `SELECT location FROM location IN company.locations WHERE location.country = 'France'`. Das Abfrageprädikat (nach Elementen filtern, die an beliebiger Stelle „France" als Land oder Region enthalten) würde dem Pfad entsprechen, der rot hervorgehoben ist:



https://docs.microsoft.com/de-de/azure/cosmos-db/index-overview

Consistency levels





https://docs.microsoft.com/de-de/azure/cosmos-db/consistency-levels

Comparing NoSQL vs. RDBMS

Document Database

BASE

Basic Availability

- The database appears to work most of the time.

Soft-state

- Stores don't have to be write-consistent, nor do different replicas have to be mutually consistent all the time.

Eventual consistency

- Stores exhibit consistency at some later point (e.g., lazily at read time).

Relational Database

ACID

Atomic

- All operations in a transaction succeed or every operation is rolled back.

Consistent

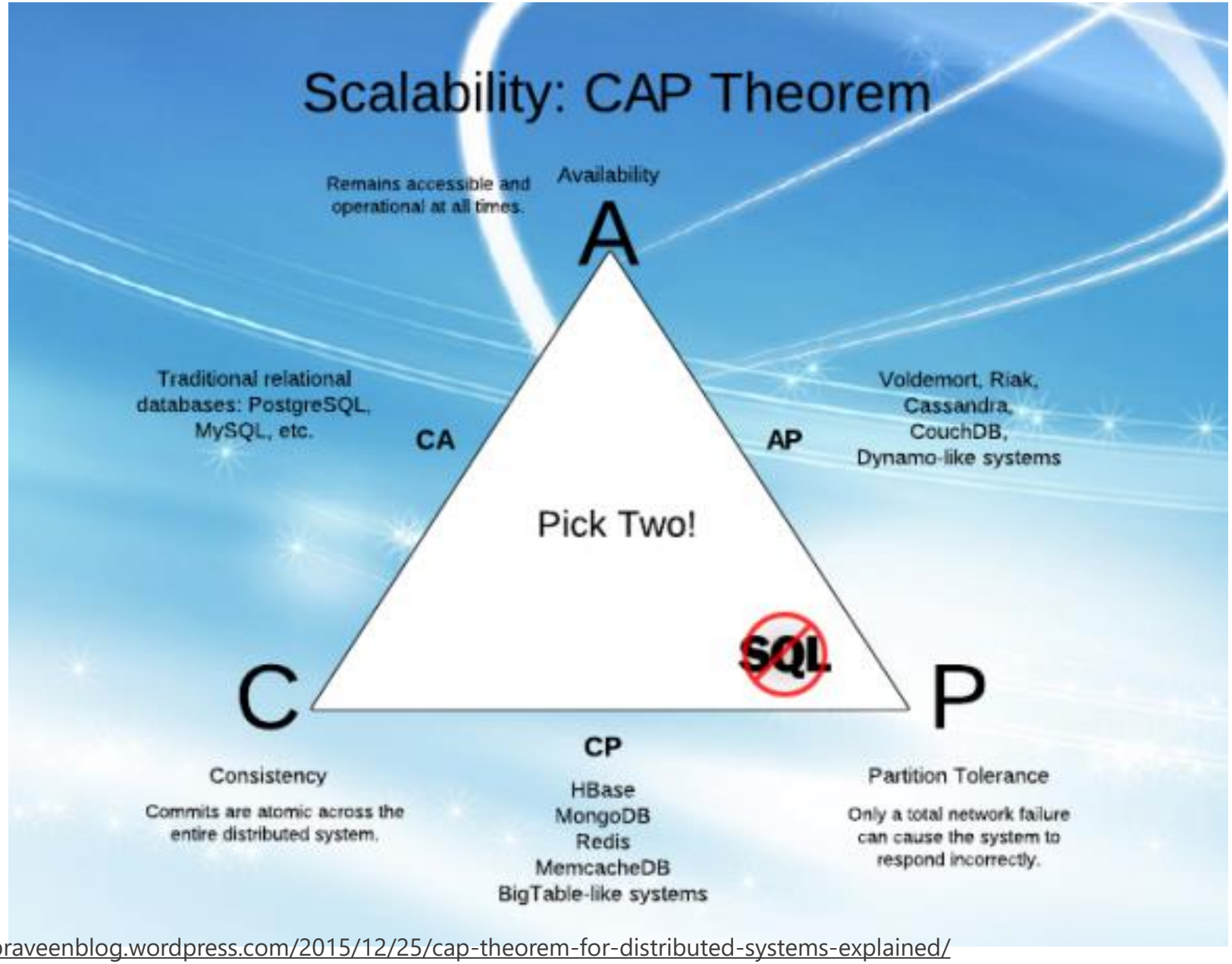
- On the completion of a transaction, the database is structurally sound.

Isolated

- Transactions do not contend with one another. Contentious access to data is moderated by the database so that transactions appear to run sequentially.

Durable

- The results of applying a transaction are permanent, even in the presence of failures.



https://saipraveenblog.wordpress.com/2015/12/25/cap-theorem-for-distributed-systems-explained/

Tools

Data migration tool

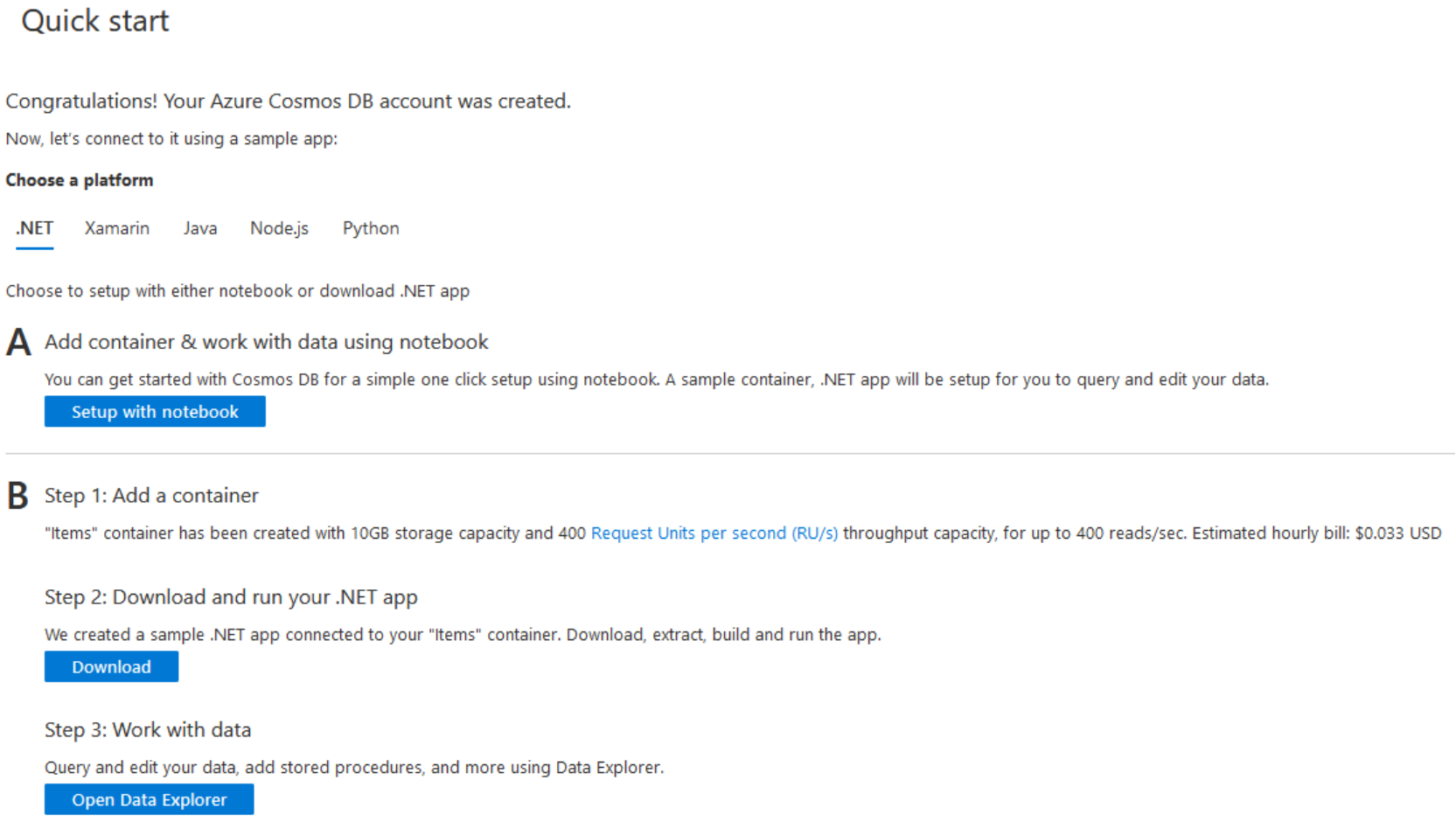
https://docs.microsoft.com/en-us/azure/cosmos-db/import-data

Azure Storage Explorer (SQL + Table)

Robo 3T (mongo)

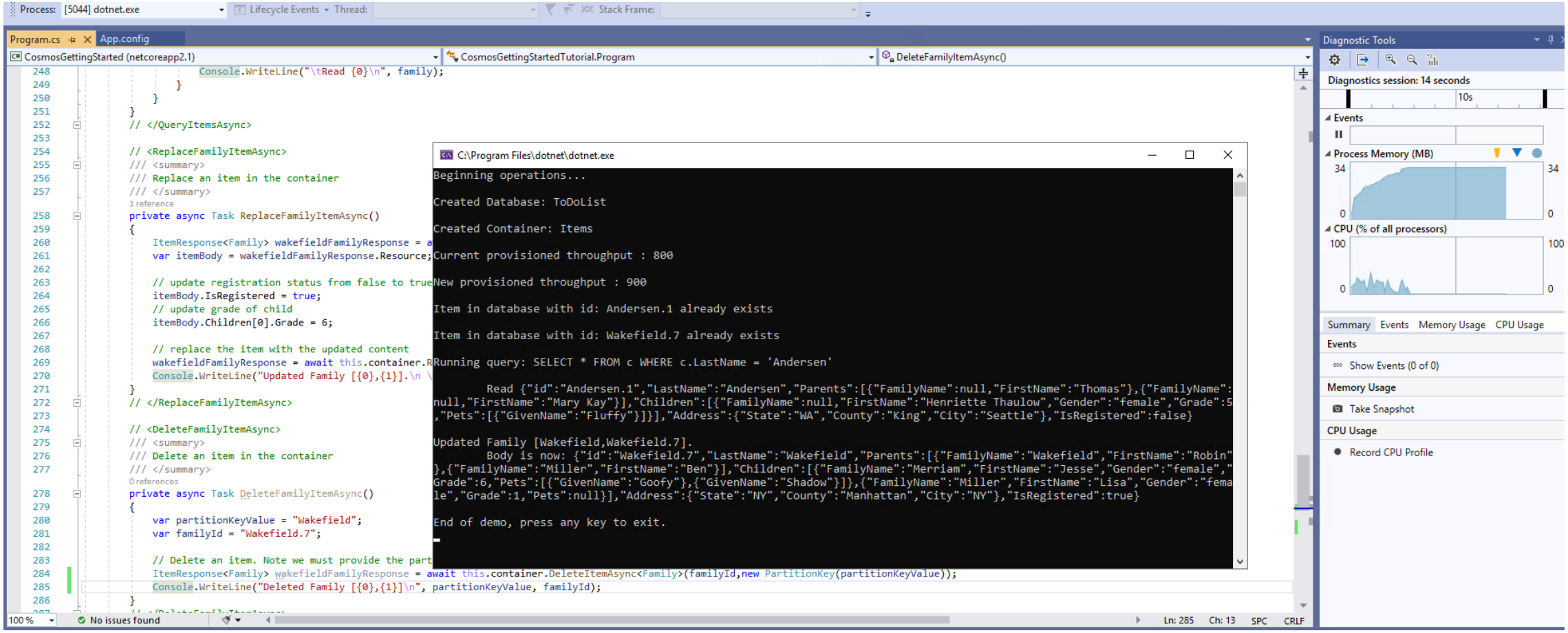
MongoDB Compass

Quick start



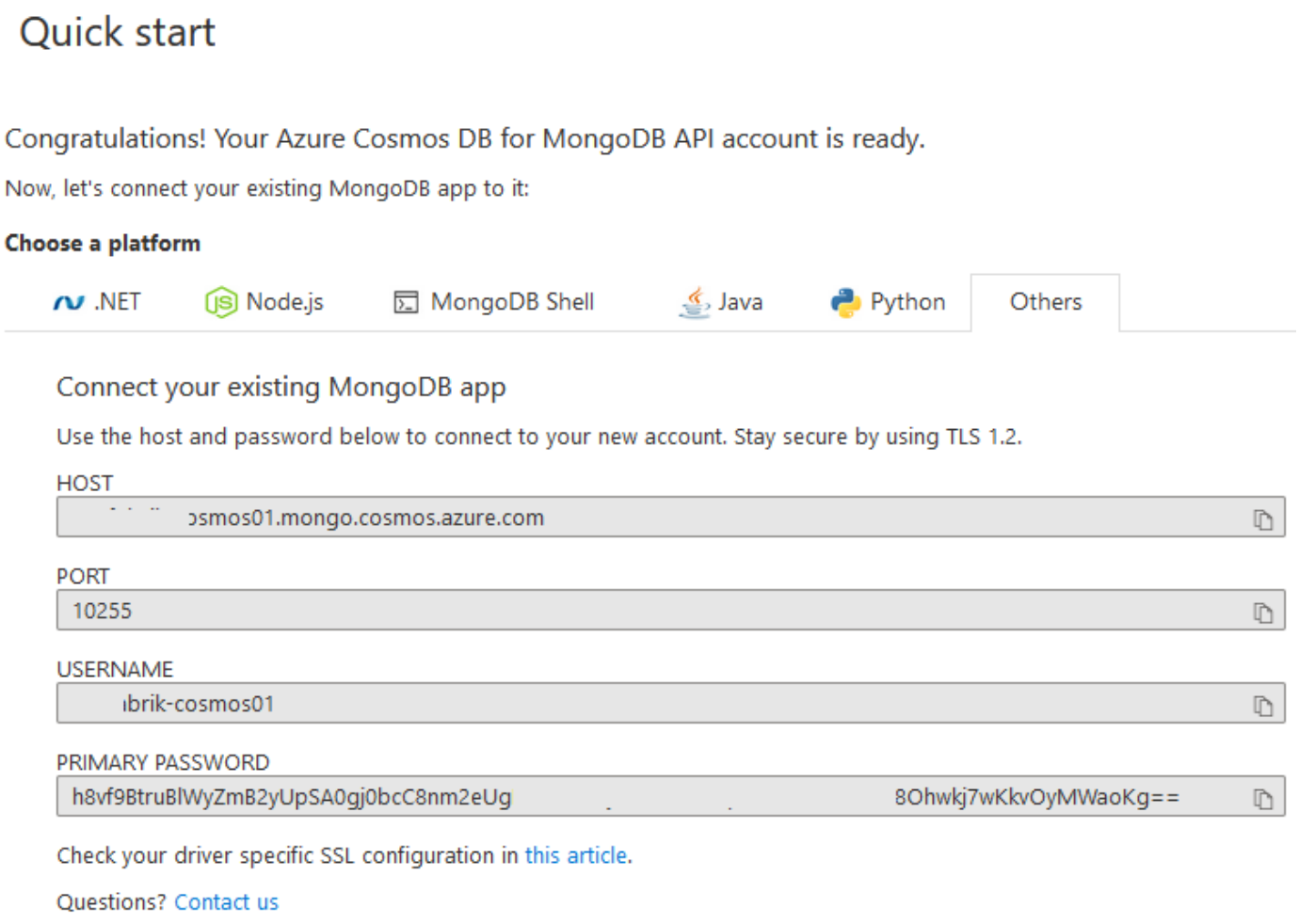
https://docs.microsoft.com/de-de/azure/cosmos-db/sql-api-sdk-dotnet

Quick start



.net - CDE

Quick start


Quick start
Congratulations! Your Azure Cosmos DB for MongoDB API account is ready.
Now, let's connect your existing MongoDB app to it:
Choose a platform
.NET
Node.js
MongoDB Shell
Java
Python
Others
Connect your existing MongoDB app
Use the host and password below to connect to your new account. Stay secure by using TLS 1.2.
HOST
osmos01.mongo.cosmos.azure.com
PORT
10255
USERNAME
ibrik-cosmos01
PRIMARY PASSWORD
h8vf9BtruBlWyZmB2yUpSA0gj0bcC8nm2eUg 8Ohwkj7wKkvOyMWaoKg==
Check your driver specific SSL configuration in this article.
Questions? Contact us

some more links

https://github. /movcom/mikepfeifferieapp-documentdb

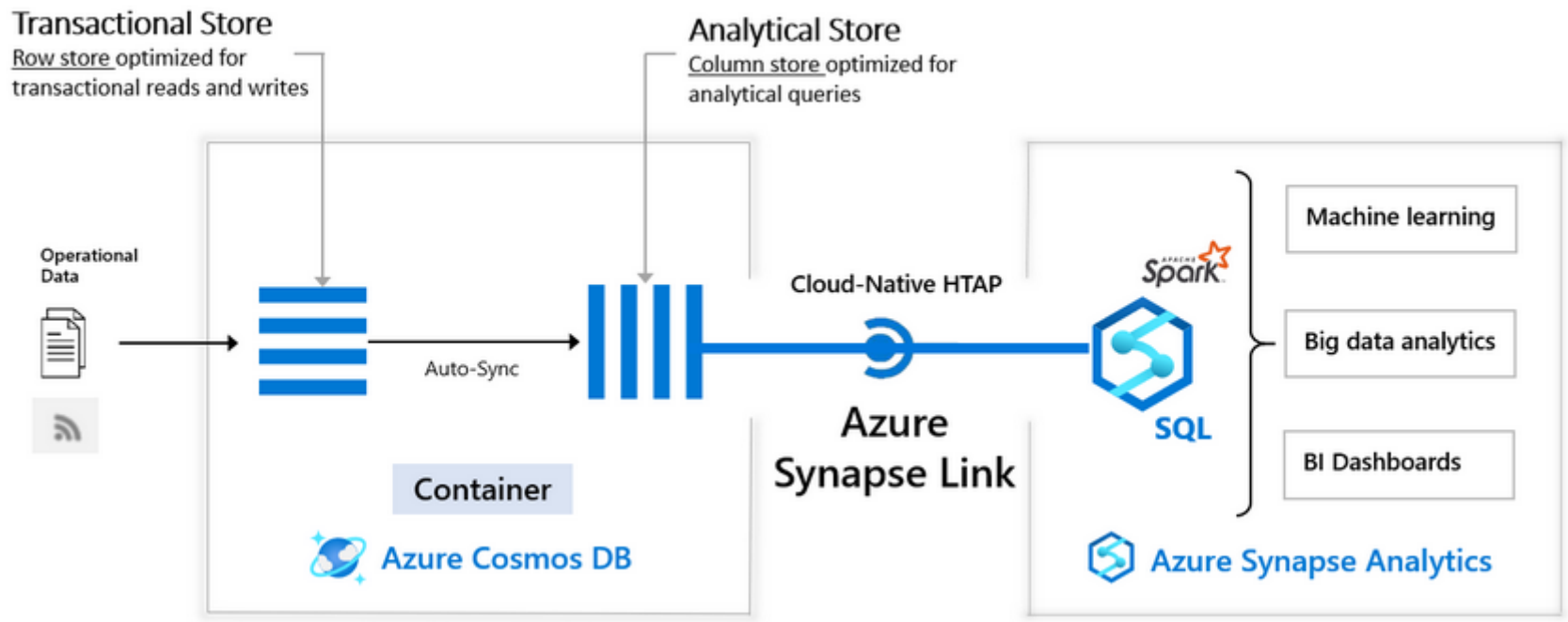
https://docs.microsoft.com/de-de/azure/architecture/guide/technology-choices/data-store-overview

https://github.com/Azure/azure-cosmos-dotnet-v2/tree/master/samples

https://azure.microsoft.com/de-de/blog/announcing-general-availability-of-azure-cosmos-db-reserved-capacity/

Azure Synapse Link

https://docs.microsoft.com/de-de/azure/cosmos-db/synapse-link
https://docs.microsoft.com/de-de/azure/cosmos-db/analytical-store-introduction
https://docs.microsoft.com/de-de/azure/cosmos-db/synapse-link-frequently-asked-questions



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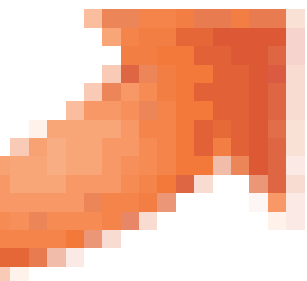
Bronze Sponsor

.. bis zum nächsten event



.. jetzt einen schönen

Feierabend