



DATA FOR ALL AZURE COSMOS DB

FEB 09 AT 10 AM PACIFIC

Your Host Simon




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About Me

- Microsoft MVP in Developer Technologies 2009-2023
 - Owner of Cleveland Tech Consulting
 - Bachelor's Degree in Computer Science Engineering Technology
 - Conference organizer
 - Speaker at community events
 - Blogger at Sadukie.com, Data-Adventurer.com
 - Wife to a fellow geek, mom to 2 kiddos
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Azure Cosmos DB



For All?

- Document data
- Columnar data
- Graph data
- Key-value data
- Relational data at any scale



Cosmos DB's API for MongoDB



Gremlin
 $G = (V, E)$



Table API

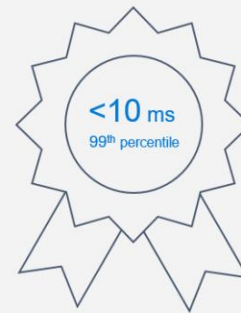


What is Azure Cosmos DB?

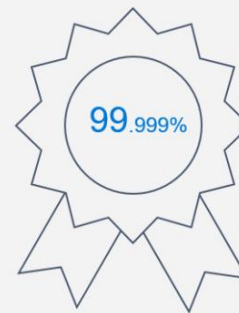
- Microsoft's flagship NoSQL offering in Azure
- Turnkey global distribution
- Single-digit millisecond reads and writes
- Elastic scale storage and throughput
- Automatic & synchronous multi-region replication
- Manual and automatic failover
- 5 well-defined consistency models
- Analytics ready
- Enterprise-grade security and encryption enabled by default
- Supports relational databases as of October 2022!
- **Can be tried for free!**

Comprehensive SLAs

Latency



HA



Throughput



Consistency



Who uses Azure Cosmos DB?

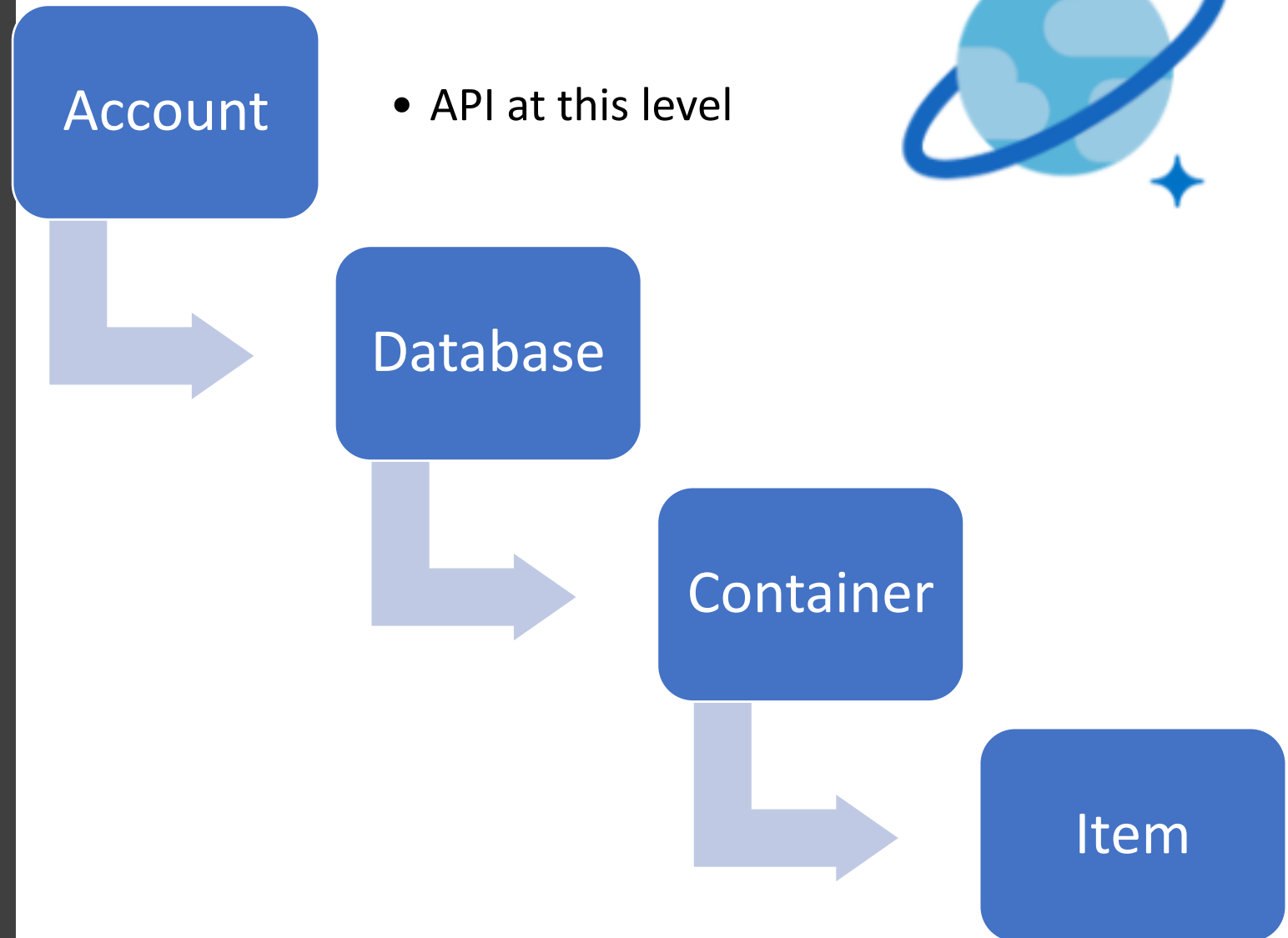


Document Data



Azure Cosmos DB for NoSQL

- Schema-less
- Automatic indexes, regardless of data model
- Works across every data model
- Ingest and serve data in milliseconds
- Data stored in JSON
- Queried using a SQL syntax
- Change Feed feature can be used for event sourcing, materialized views, and more
- Free Tier



Azure Cosmos DB for MongoDB



Cosmos DB's API for
MongoDB

- Wire-protocol compatible – 4.2 in production, 5.0 in preview
 - Can also 3.2, 3.6, and 4.0 – feature flags
- Can use libraries used for MongoDB – pymongo, mongo-java-driver, MongoDB.Driver, Simba, etc.
- 99.999% availability
- Three ways
 - Provisioned
 - Autoscale – zero warmup!
 - Serverless
- Free Tier
- Some MongoDB features are not supported



[4.2 server version
supported features and
syntax in Azure Cosmos
DB for MongoDB |
Microsoft Learn](#)

Columnar Data



Azure Cosmos DB for Apache Cassandra

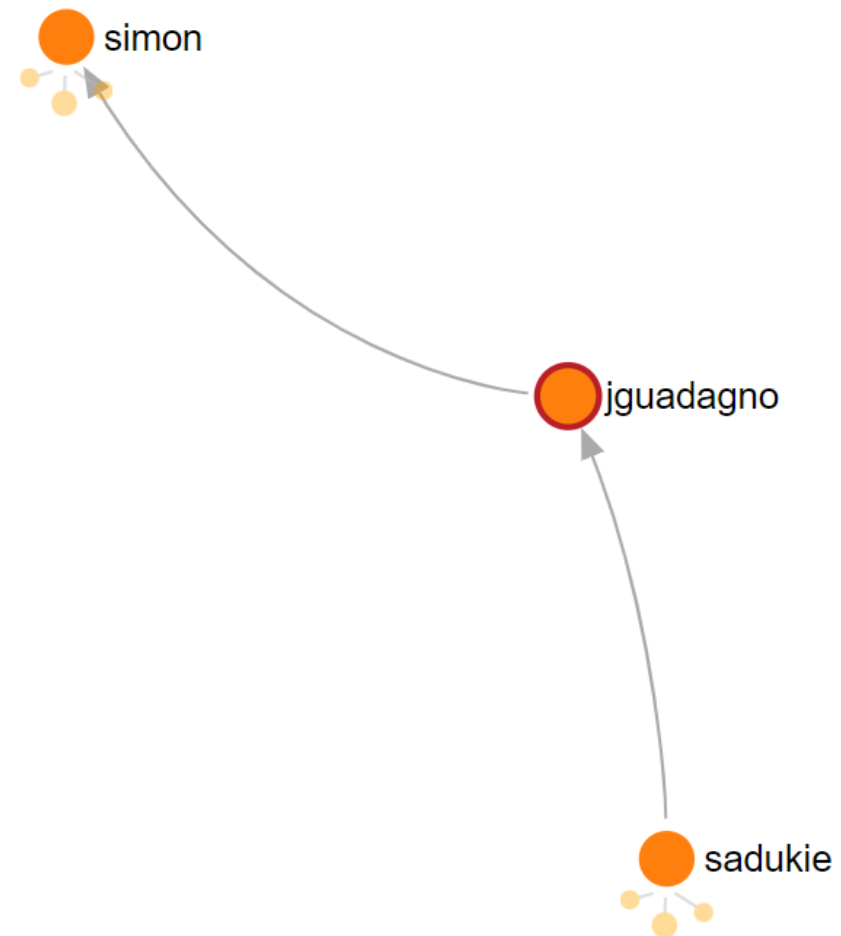


- Fully managed, serverless Apache Cassandra as a service
 - No need for **nodetool** commands
- Uses Cassandra Query Language (CQL) for querying
- Runs Binary Protocol v4
- The benefits of Azure Cosmos DB while using Apache Cassandra tools
- Allows for bigger partitions (20GB) vs Apache Cassandra (recommends 100MB)
- Azure Cosmos DB does **durable commits**



[Apache Cassandra features supported by Azure Cosmos DB for Apache Cassandra | Microsoft Learn](#)

Graph Data



Azure Cosmos DB for Apache Gremlin

- From the Apache TinkerPop project
- Operates on the concepts of vertices and edges
- Exploring relationships between things at the data level
- Queries are done using the Gremlin syntax (strings and parameterized queries – data in JSON; bytecode syntax not supported)
- Use Gremlin tools for .NET, Java, Python, Node.js, PHP, Go Lang, and from the Gremlin console



[Azure Cosmos DB for Gremlin support and compatibility with TinkerPop features | Microsoft Learn](#)

Key-Value Data



Azure Cosmos DB for Table



- Same table model as Azure Table
- Managed service that provides the benefits of Azure Cosmos DB with the support for Azure Table storage
 - Better SLAs
 - Pricing supports consumption and provisioned capacity
 - Configurable consistency levels vs Strong primary/Eventual secondary
 - More indexing
 - No upper limit on throughput
 - Support for more operations/sec per table
- Uses the same CRUD operations through the Azure Table Storage SDKs



[Azure Table Storage support in Azure Cosmos DB](#)
[| Microsoft Learn](#)

Azure Cosmos DB for PostgreSQL

Relational Data at any scale!

Azure Cosmos DB for PostgreSQL



- Formerly known as Azure Database for PostgreSQL (Hyperscale)
- Relational data **at any scale**
- Managed service powered by the Citus extension for Postgres
- Data can be horizontally sharded for scale
- Can start with a single node or a multiple node setup
- Each node is a standalone Postgres server



[Azure Cosmos DB for PostgreSQL learning path - Training | Microsoft Learn](#)

Connection String support

PostgreSQL connection URL

psql

JDBC

Node.js, Python, Ruby, PHP, C++ (libpq)


ADO.NET

Resources

Try Azure Cosmos DB for Free!

Recommended APIs


Others



Azure Cosmos DB for NoSQL (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



Azure Cosmos DB 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



Azure Cosmos DB for Apache 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



Azure Cosmos DB for PostgreSQL

Fully-managed relational database service for PostgreSQL with distributed query execution, powered by the Citus open source extension. Build new apps on single or multi-node clusters—with support for JSONB, geospatial, rich indexing, and high-performance scale-out.

Create

Not sure which API will best meet your needs? [Learn more about Azure Cosmos DB data model](#)



[Use Azure Cosmos DB for Free](#)

Requires a Microsoft Account
or GitHub Account

Consent for Trial

Permission requested by:


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trycosmosdbforpg.onmicrosoft.com


By accepting, you allow this organization to:

- ✓ **Receive your profile data**
Your profile data means your name, email address, and photo
- ✓ **Collect and log your activity**
Your activity data means your access, usage, and content associated with their apps and resources
- ✓ **Use your profile data and activity data**
This data may be used with your access and use of their apps and resources, as well as to create, control, and administer an account according to their policies

You should only accept if you trust TryCosmosDBforPG.
TryCosmosDBforPG has not provided a link to their privacy statement for you to review. You can update these permissions at <https://myaccount.microsoft.com/organizations>
[Learn More](#)

Sandboxed trial

 This trial expires in 29 days : 23 hours : 58 minutes. To get everything Cosmos DB has to offer, upgrade your free trial. →

 **Important:** To get started with your Free Trial you must change your password [here](#).

^ Essentials

[JSON View](#)

Resource group : [PG_RG_northcentralus_6654078d-abb9-420b-9459-8ee...](#)

Location : North Central US

Subscription : [Try CosmosDBforPG DP 01](#)

Subscription ID :

PostgreSQL version : 15

Citus version : 11.1

Configuration : [Single node configuration](#)

Coordinator name : c.sg6654078dabb9420b94598eecc47b3d59.postgres.d...

Admin username : citus

Connectivity method : [Public access \(allowed IP addresses\)](#)

Coordinator node : [Burstable, 1 vCores / 2 GiB RAM, 32 GiB storage](#)

Worker nodes : ---

Replication role : [No replicas](#)

High availability : [No](#)

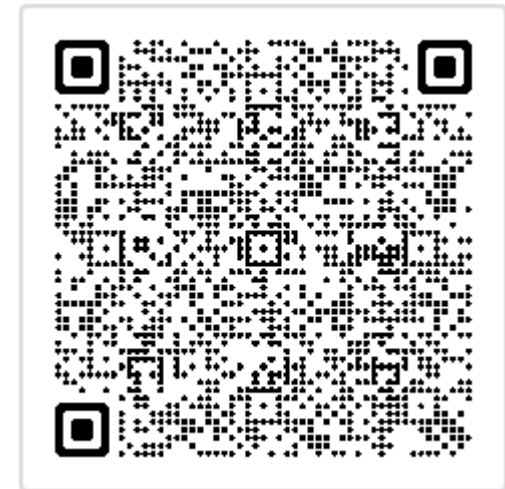
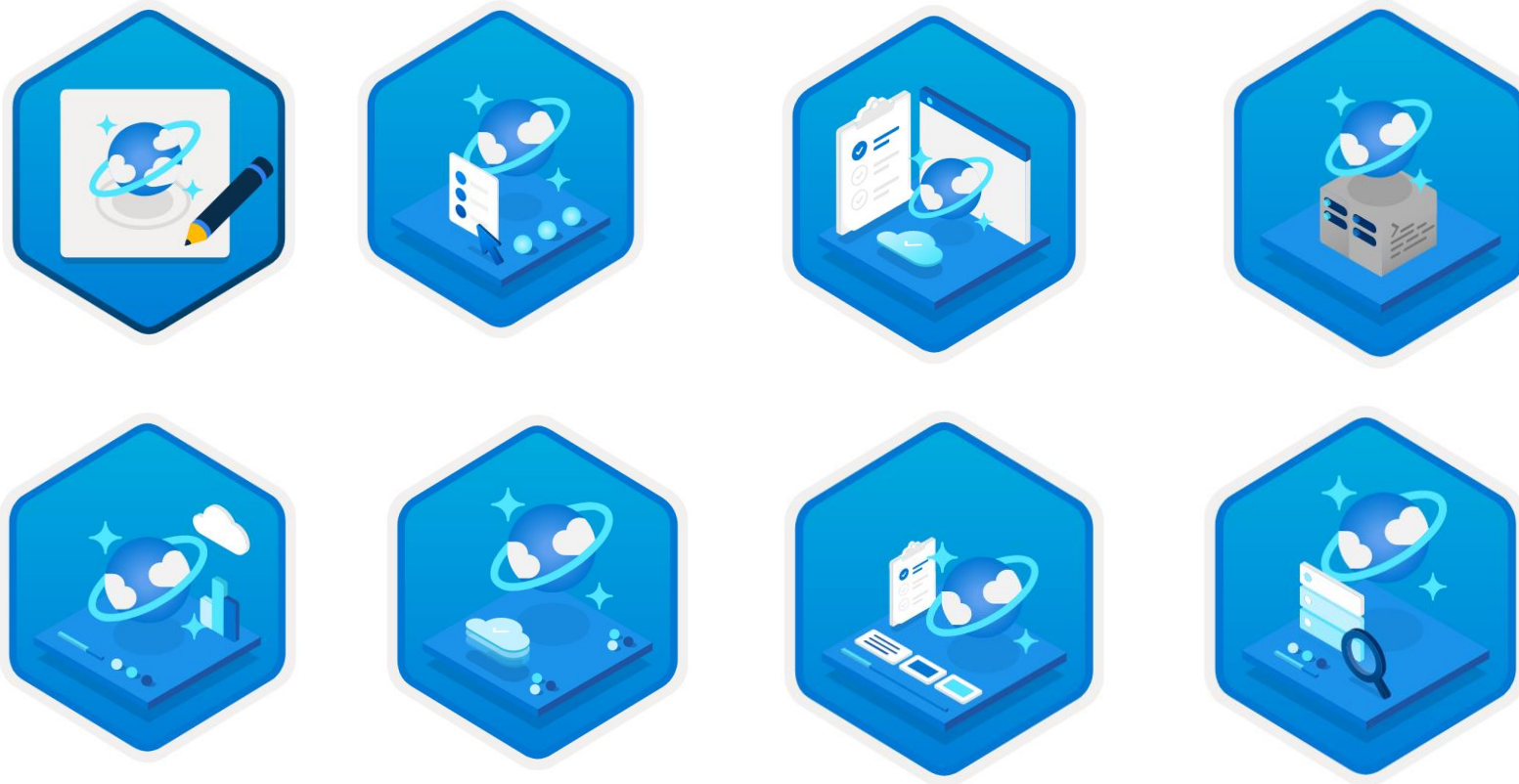


Azure Cosmos DB Global User Group



[Azure Cosmos DB Global User Group \(Redmond, WA\) | Meetup](#)

Microsoft Learn – Azure Cosmos DB Learning Paths and Modules



[Browse all learning paths and modules - Training | Microsoft Learn](#)

Azure Cosmos DB Essentials



[Azure Cosmos DB Essentials - YouTube](#)

Azure Cosmos DB Developer Site

- <https://developer.azurecosmosdb.com>
- Find developer resources for all APIs and all things Azure Cosmos DB!



GitHub repo for this session's demos

- C# demos for:
 - Azure Cosmos DB for NoSQL
 - Azure Cosmos DB for Apache Gremlin
 - Azure Cosmos DB for MongoDB
 - Azure Cosmos DB for Table
 - Azure Cosmos DB for PostgreSQL
- These slides!



[sadukie/azure-for-sure-s2-ep2:
Demo files for Azure for Sure,
Season 2, Episode 2 - "Data for All
- Azure Cosmos DB" \(github.com\)](https://github.com/sadukie/azure-for-sure-s2-ep2)

The background of the slide is a dark blue gradient filled with numerous out-of-focus, glowing blue circles of varying sizes, creating a bokeh effect. A solid dark blue banner is positioned horizontally across the lower portion of the slide.

Contact Info

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LinkedIn: /in/sadukie