

Working with Azure Cosmos DB - Gremlin (Graph) API



Reza Salehi

CLOUD CONSULTANT

@zaalion [linkedin.com/in/rezasalehi2008](https://www.linkedin.com/in/rezasalehi2008)



Overview



An introduction on the graph data model

- Graph data model components
- Use cases

What is a graph database?

Azure Cosmos DB Gremlin (graph) API

Demo: working with Cosmos DB Gremlin API



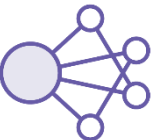
The Graph Data Model



Real world data is naturally connected



Traditional data modeling focuses on entities not relationships



For many applications, there's need to model both entities and relationships



Graph Database



A graph database persists relationships in the storage layer



This leads to highly efficient graph retrieval operations



Are included within the NoSQL or non-relational category, since there is no dependency on a schema or constrained data model



Property Graph

A property graph is a structure that's composed of vertices and edges. Both vertex and edge can have properties.



Vertices ['vər-tə-,sēz]
is the plural noun for
vertex ['vər-,teks]



Property Graph Model

Person
Julie, 44



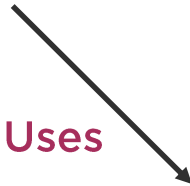
Person
John Smith



Knows



Uses



Cellphone
Android[®]

Uses



Uses



Laptop
Surface Pro[®]



Property Graph Model

Vertices

Discrete entities, such as a person, a place, or an event

Edges

Relationships between vertices. E.g. a person knows another person

Properties

Information about the vertices and edges. E.g. name or age



Property Graph Model

Person
Julie, 44



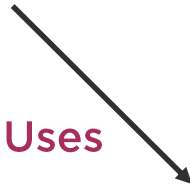
Person
John Smith



Knows



Uses



Cellphone
Android[®]

Uses



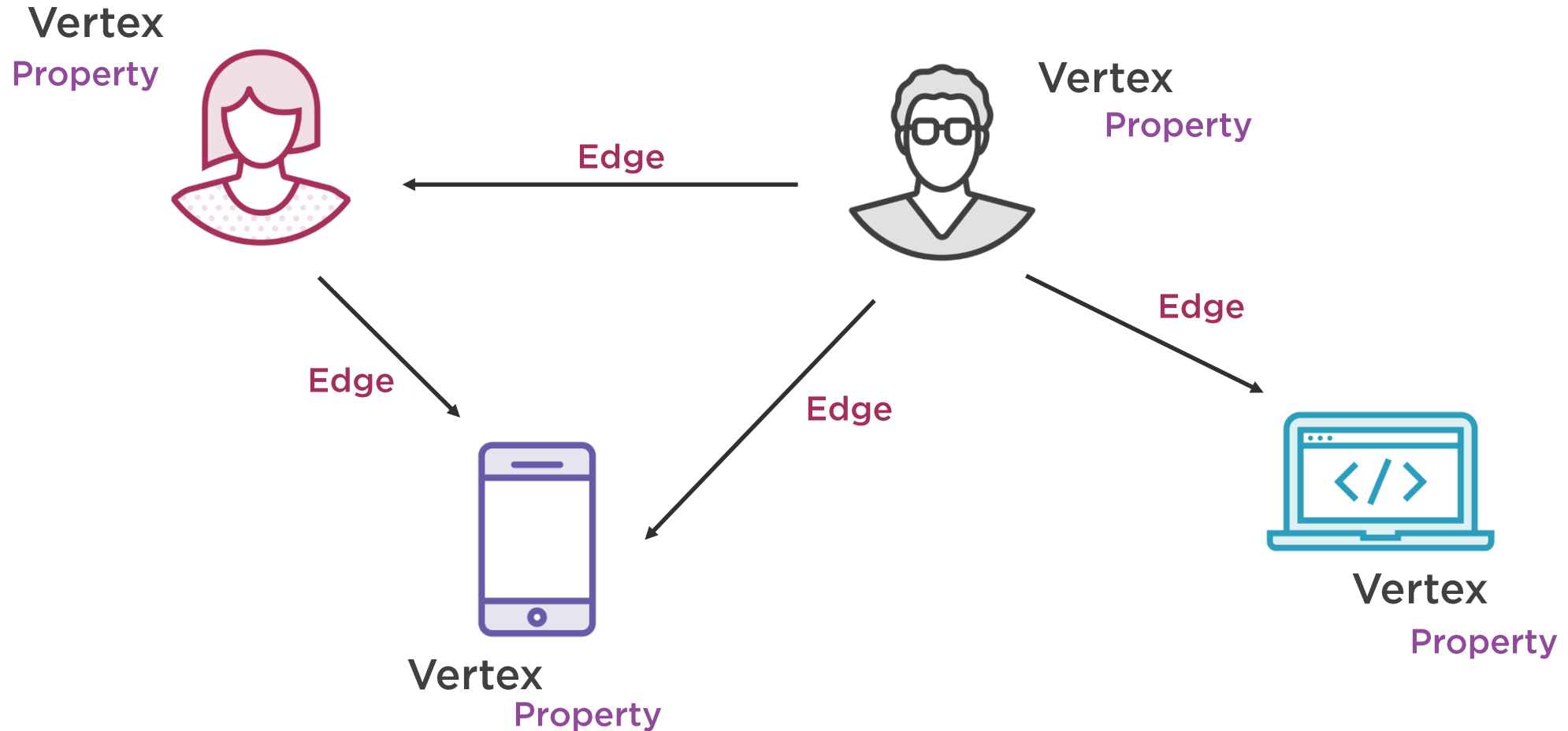
Uses



Laptop
Surface Pro[®]



Property Graph Model



Graph Data Model Scenarios

Social networks

Recommendation engines

Geospatial

Internet of Things



Traversing Graphs

Apache Gremlin is a
graph traversal
language

Compare it to what
SQL is to a
relational database

Use Gremlin to add,
update, delete, and
query graph items



Cosmos DB supports the
graph data model via Azure
Cosmos DB Gremlin
(graph) API.



Features of Azure Cosmos DB Graph Database

Elastically scalable
throughput and
storage

Fully managed
graph database

Familiar Gremlin
syntax

Multi-region
replication

Automatic
indexing

Tunable
consistency levels



Containers in Each API

Azure Cosmos API

Specialized Entity

SQL API

Collection

Table API

Table

MongoDB API

Collection

Cassandra API

Table

Gremlin API

Graph



Provisioning Azure Cosmos DB Gremlin API

Create Azure Cosmos DB Account

Try Cosmos DB for free, up to 20K RU/s, for 30 days with unlimited renewals. →

Basics Network Tags Review + create

Azure Cosmos DB is a globally distributed, multi-model, fully managed database service. 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

Pay-As-You-Go

* Resource Group

Select existing...

Create new

Instance Details

* Account Name

Enter account name

* API ⓘ

Gremlin (graph)

Jupyter Notebooks or Apache Spark ⓘ

Sign up for Jupyter Notebooks or Apache Spark preview

* Location

(US) East US

Geo-Redundancy ⓘ

Enable Disable

Multi-region Writes ⓘ

Enable Disable



Interact with Cosmos DB Gremlin API

**The SDK (available for .NET,
Java, Node.js, Python, PHP)**

**Gremlin (Gremlin Console or
Azure Portal)**



SQL can be used to query
Cosmos DB Gremlin API.



Demo



Provisioning a new Cosmos DB Gremlin API instance

Creating a graph using the .NET SDK



Demo



Running Gremlin queries in Data Explorer



Summary



An introduction on the graph data model

- Graph data model components
- Use cases

Understanding a graph database

Azure Cosmos DB Gremlin (graph) API

Demo: working with Cosmos DB Gremlin API

