.NET Conf

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Navigating Graphs in Azure Cosmos DB for Apache Gremlin using Gremlin.Net

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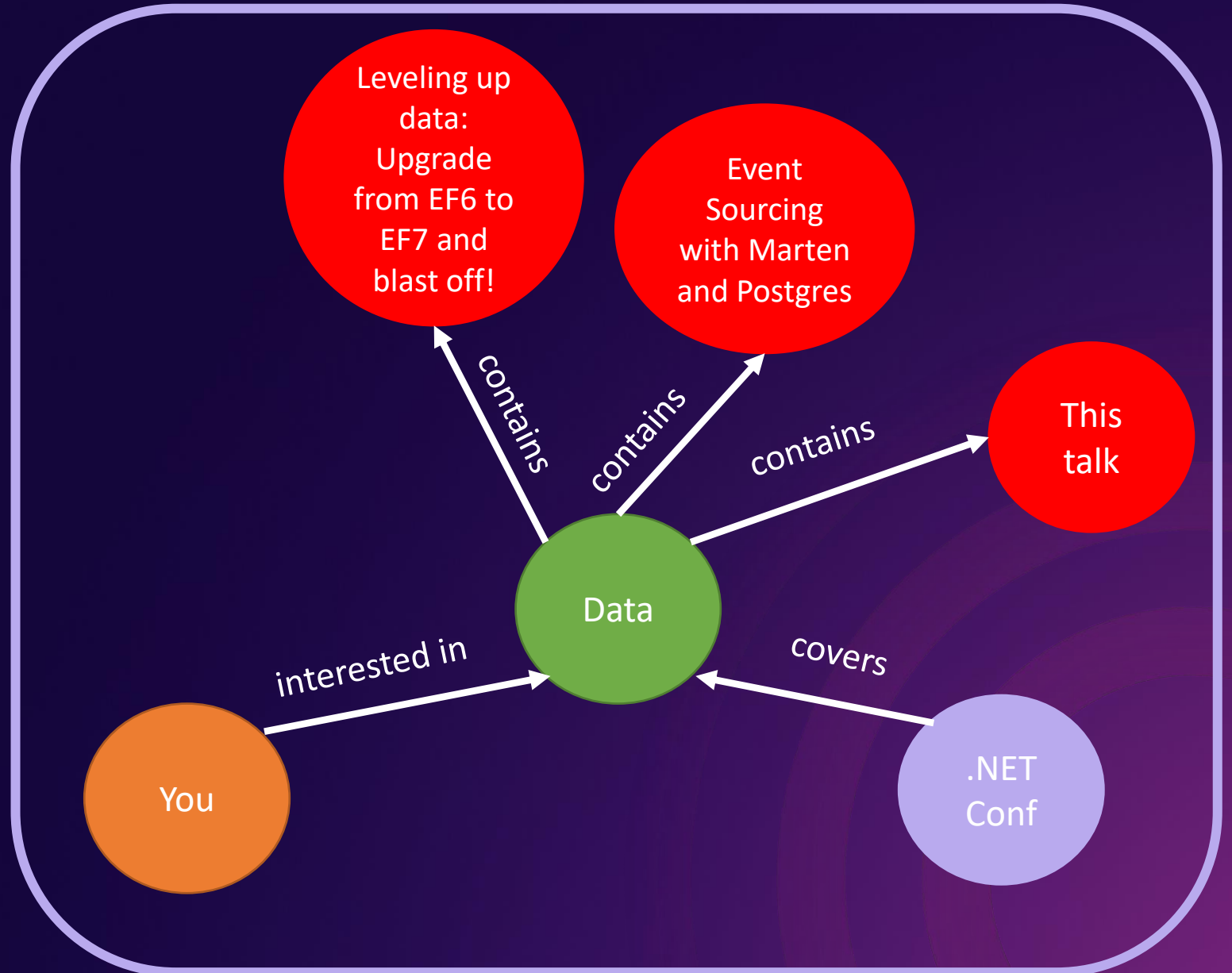
About Graph Databases

- Recommendation engines
- Social networks
- Symbolic reasoning
- Identity and access management
- Knowledge graphs

- Fraud detection – loans, insurance, credit cards
- Asset management
- Master data management
- Supply chain management
- Situational awareness

Azure Cosmos DB for Apache Gremlin

- Azure Cosmos DB is a multi-model database – with APIs for graph data, document data, wide-column stores, horizontal scaling relational data, and key-value pairs

- "for Apache Gremlin" - Graph database implementation in Azure Cosmos DB using Apache Gremlin syntax

- Can have partitioned graphs for horizontal scaling

- Query in browser with Azure Data Explorer

- Add to a graph with Azure Data Explorer

- Build graphs with API libraries
  - Today's demo is the Gremlin.Net package

Key Concepts

- **Vertex** – node – entity - thing

- **Edge** – arrows (directional) – relationships

- **Graph** – collection of vertices and edges

- **Label –** descriptor to identify type of vertex or type of edge

Azure Cosmos DB for Apache Gremlin – Support

- Only GraphSON v2 is supported.
  - Documentation recommends passing the traversal as a string.
  - We are using Gremlin.Net.Extensions for parameterized queries to lessen injection fears.
- Gremlin.Net 3.4.x is supported, but not higher than that.
  - Version used in today's demo is 3.4.13.
  - Gremlin.Net 3.5 and 3.6 have compatibility issues with Azure Cosmos DB.
  - More details on Gremlin support here: Azure Cosmos DB for Gremlin support and compatibility with TinkerPop features
- Only primitive types for properties

- Azure Cosmos DB for Apache Gremlin account
  - Azure Cosmos DB Free Tier
- Visual Studio 2022 Community Edition
- 3 projects
  - Console App
  - .NET MAUI App
  - Class Library
- Dependencies
  - Gremlin.Net – 3.4.13
  - Gremlin.Net.Extensions – 0.3.0

Demo

Using Gremlin.Net to work with Azure Cosmos DB

https://github.com/sadukie/dotnet-conf-2022-gremlin-net-demo/

Additional Resources

- Azure Cosmos DB Cheat Sheets
- Azure Cosmos DB Gremlin graph support and compatibility with TinkerPop features
- Ingest data in bulk in Azure Cosmos DB for Gremlin by using a bulk executor library
- Practical Gremlin: An Apache TinkerPop Tutorial by Kelvin R. Lawrence
- Gremlin Cheat Sheet by Daniel Kuppitz

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