NoSQL

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OVERVIEW

- What is NoSQL
- Big Tables
- Key-value Stores
- Graph Stores
- Document Databases

What is NoSQL

- Stands for Not Only SQL
- Types are document, graph stores, key-value stores, and BigTable
- Schema not required (schema on read)
- No need to be relational
- Can store same data multiple times

What is NoSQL

- **Highly distributable**
- **Open source versions**
- **May use BASE (eventual consistency) or ACID transactions**
- **PL/B has always been a NoSQL solution**

Big Tables

- Also known as wide-column stores
- Based on 2006 Google Bigtable paper
- Organize data tables as columns instead of as rows
- Optimized for queries over large datasets

Big Tables

- Each row doesn’t require a single value per column
- Fields do not even need to exist, so no NULL values
- All related data can be obtained through record id
- Cassandra, HBase, SimpleDB, and Azure Cosmos DB

Key-Value Stores

- **Simple data model that pairs a unique key with an associated value**
- **Application must perform all value handling**
- **Very fast read performance**
- **Could store user sessions, user personalization, data caching**
- **Berkeley DB, Redis, Riak, and Azure Cosmos DB**

Graph Stores

- **Stores data as nodes and edges**
- **Nodes are like records in a relational database**
- **Edges represent connections between nodes**
- **FaceBook, LinkedIn are social graphs**

Graph Stores

- **Supports triples as subject, predicate, and object**
- **Bill programs_with PL/B**
- **PL/B is_a Computer_language**
- **AllegroGraph, IBM Graph, Neo4j and Azure Cosmos DB**

Document Databases

- Stores semi-structured data and descriptions in document format
- Pairs each key with a document
- Common document formats are JSON and XML
- Supports ad hoc queries, indexing, and real time aggregation

Document Databases

- **Could store orders, recipes, images, PDFs, …**
- **CouchDB, MongoDB and Azure Cosmos DB**
- https://www.mongodb.com/cloud/stitch

Questions?