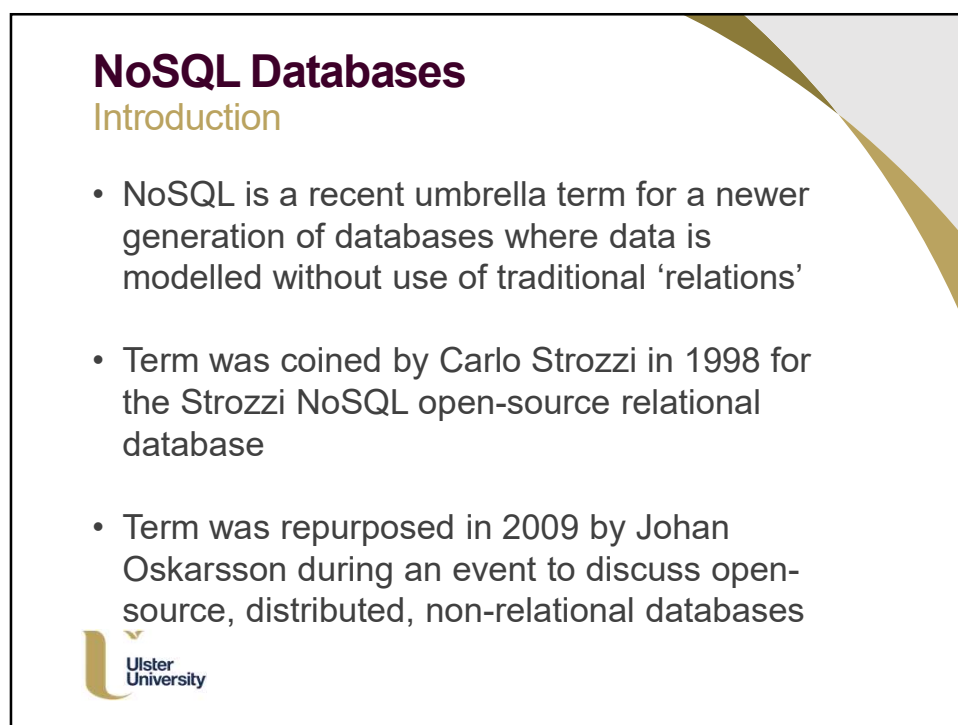


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NoSQL Databases

Introduction

- Existed since the late 1960's but rose to prominence for certain use cases at the turn of the century
- Typically support SQL-Like query languages, a more accurate term would be NoREL
- NoSQL databases have recently been labelled as Not only SQL



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NoSQL Databases

Introduction

- NoSQL DBs typically have advantages and disadvantages over relational DBs
- Relational databases have a number of problems reducing their applicability to solutions
- Poor performance
 - Additional overheads from Rules and Axioms to give relational functionality
 - Difficult to scale across nodes



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NoSQL Databases

Introduction

- Other limitations include:
 - Inability to handle a large volume of data
 - Inability to handle highly variable data/data types
 - Limited optimisation for high performance read access - notably when variable length fields are incorporated
 - Relatively poor scalability



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NoSQL Databases

Introduction

- NoSQL databases have a number of strengths that partially address these
 - Large scalability across multiple nodes is supported
 - Performance is improved by:
 - Reduction of rules and axioms
 - Removing relational modelling
 - Employing an “eventually consistent” strategy*
 - Reduction in querying capability



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NoSQL Databases

Introduction

- NoSQL databases may have a number of weaknesses compared to Relational DBs
 - ACID consistency is not guaranteed across all NoSQL databases*
 - Updates to data may not be replicated across all nodes immediately, leading to update/read race conditions
 - Advanced querying may not be supported, for example Joins in queries are not typically possible



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NoSQL Databases

Introduction

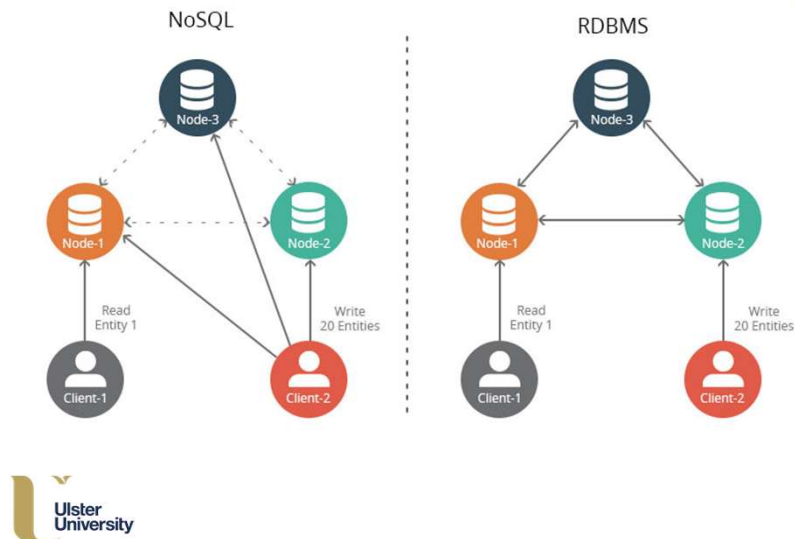
Aspect	NoSQL	RDBMS
Availability	Good	Good
Consistency	Poor	Good
Data handling	Supports big data scale workloads	Medium to large workloads*
Performance	High	Low
Reliability	Low to Moderate	Good
Scalability	High	Moderate**



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NoSQL Databases

Introduction



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NoSQL Databases

Introduction

- Early examples of NoSQL databases include
 - Amazon Dynamo
 - Google BigTable
- Current popular NoSQL databases:
 - Couchbase
 - Hadoop
 - HBase



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NoSQL Databases

Introduction

- Current popular NoSQL databases
 - Influx DB
 - MongoDB
 - Neo4J
 - Redis
 - Virtuoso



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NoSQL Databases

Introduction

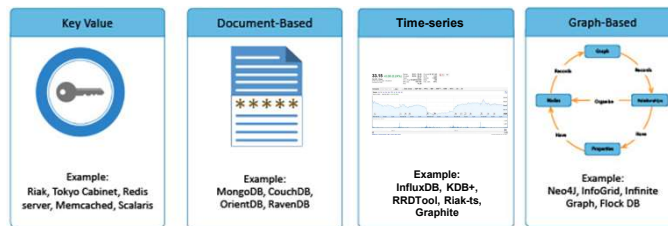
- These databases span many different classes, such as:
 - Column – HBase
 - Data structure - Redis
 - Document – MongoDB
 - Graph – Neo4J/Virtuoso
 - Key-Value – CouchBase
 - Semantic – Virtuoso/Protégé
 - Time series DB - InfluxDB



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NoSQL Databases

Introduction



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NoSQL Databases

Introduction

- Over the upcoming weeks we will cover a subset of these databases in theory and practically
- Next: Documented oriented databases – Mongo DB



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