SPRING FRAMEWORK GURU

RDMBS

- Relational Database Management Systems - Type of a DBMS specifically for Relational Databases

- **REVIEW** - DBMS's have 4 important characteristics:

  - **Data Definition** - define the data being tracked

  - **Data Manipulation** - add, update or remove data

  - **Data Retrieval** - extract and report on the data in the database

  - **Administration** - defining users on the system, security, monitoring, system administration

Data Definition

- **DDL** - Data Definition Language (ie CREATE TABLE…) is used to define the relational model

- Under the covers, the RDBMS will store data about your tables in catalog tables

- The software is used to enforce data being stored conforms to the rules you've defined for the data.

  - You can't store a text (string) in a number field

  - You must provide a value

  - etc.

Data Manipulation

- **DML** - Data Manipulation Language

- Allows you to add (INSERT), change (UPDATE), or remove (DELETE) data.

- The RDBMS enforces data manipulation adheres to the rules of the **Data Definition**.

- The RDBMS allows set up 'rules' for multi-user systems.

- These rules manage what happens in competing conditions. (what happens when two users want to update the same data, at the same time)

- Enforces Data Integrity - What happens when things go wrong?

Data Retrieval

- Data Retrieval is the act of pulling data out of the database

- The RDBMS determines the optimal way to retrieve data out of the database.

- Multi-table joins can become very complex.

  - Consider tables with billions and billions of rows.

  - Reports can go from seconds, to hours when the retrieval strategy is wrong.

- The RDBMS also considers what happens when updates occur while your report is running.

Administration

- Users - RDBMS define user accounts

- User accounts have security roles which control what individual users can see, update, delete, etc

- RDBMS have tools to see performance metrics which can be used to identify costly operations

- System Administration Includes:

  - Defining users

  - Where the database stores its data on the computer system
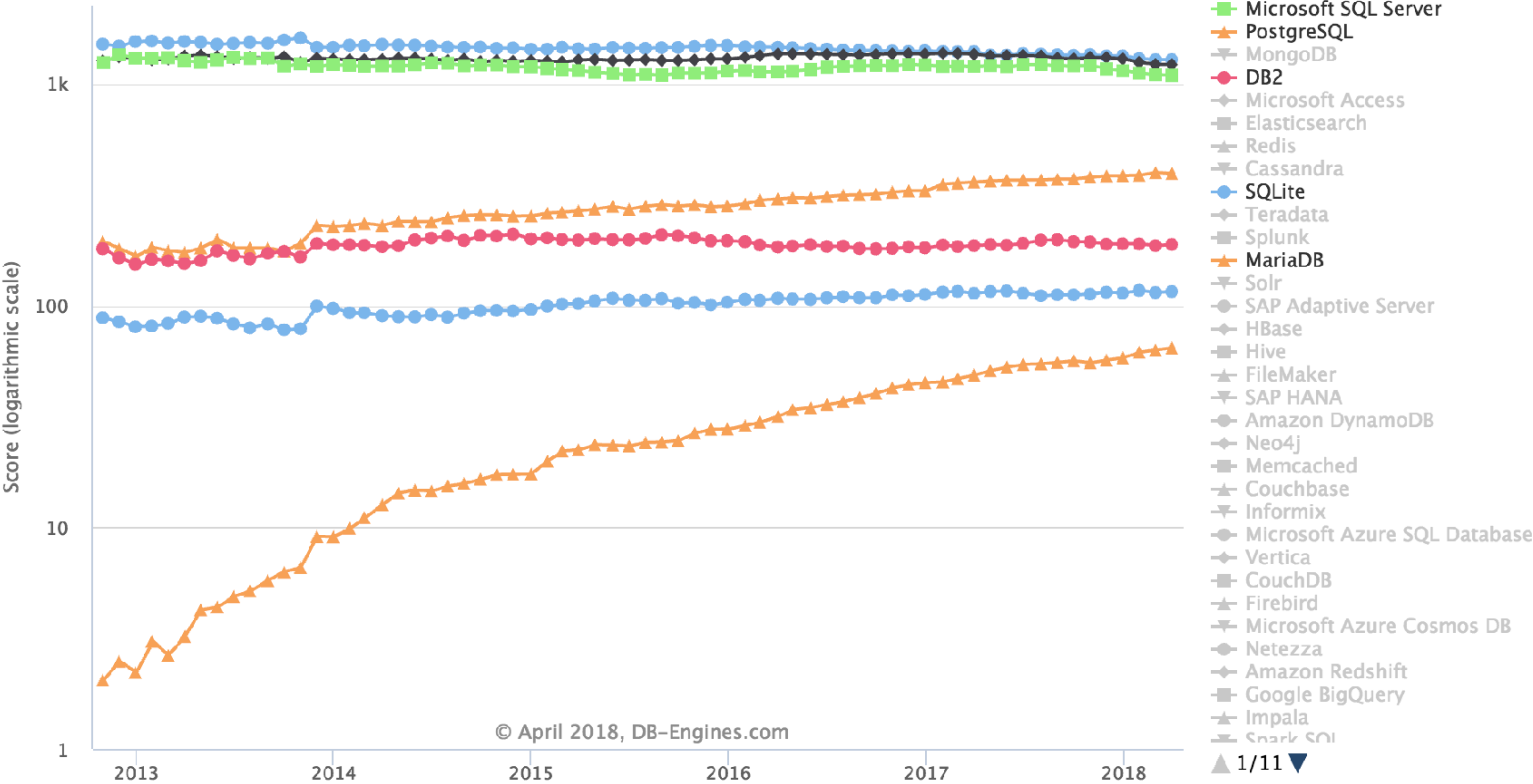
  - Backups and Auditing

Market Share Leaders

- What does the Industry look like for RDBM systems?

- Who is the biggest, who is trending?

DB-Engines Ranking

Legend:
- Oracle
- MySQL
- Microsoft SQL Server
- PostgreSQL
- MongoDB
- DB2
- Microsoft Access
- Elasticsearch
- Redis
- Cassandra
- SQLite
- Teradata
- Splunk
- MariaDB
- Solr
- SAP Adaptive Server
- HBase
- Hive
- FileMaker
- SAP HANA
- Amazon DynamoDB
- Neo4j
- Memcached
- Couchbase
- Informix
- Microsoft Azure SQL Database
- Vertica
- CouchDB
- Firebird
- Microsoft Azure Cosmos DB
- Netezza
- Amazon Redshift
- Google BigQuery
- Impala
- Spark SQL

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NoSQL and RDBMS

- NoSQL Databases are very popular in the headlines

- Is this the end of Relational Databases?

DB-Engines Ranking

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