CS 572 Modern Web Applications

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V3.0.0

JavaScript Full Stack Development

- MongoDB
  - NoSQL database (document store)
  - Stores JSON documents
- Express
  - JavaScript web framework
  - On top of Node
- Angular
  - JavaScript UI framework
  - Single Page Applications
- Node
  - JavaScript server-side platform
  - Single threaded, fast and scalable

Roadmap and Outcomes

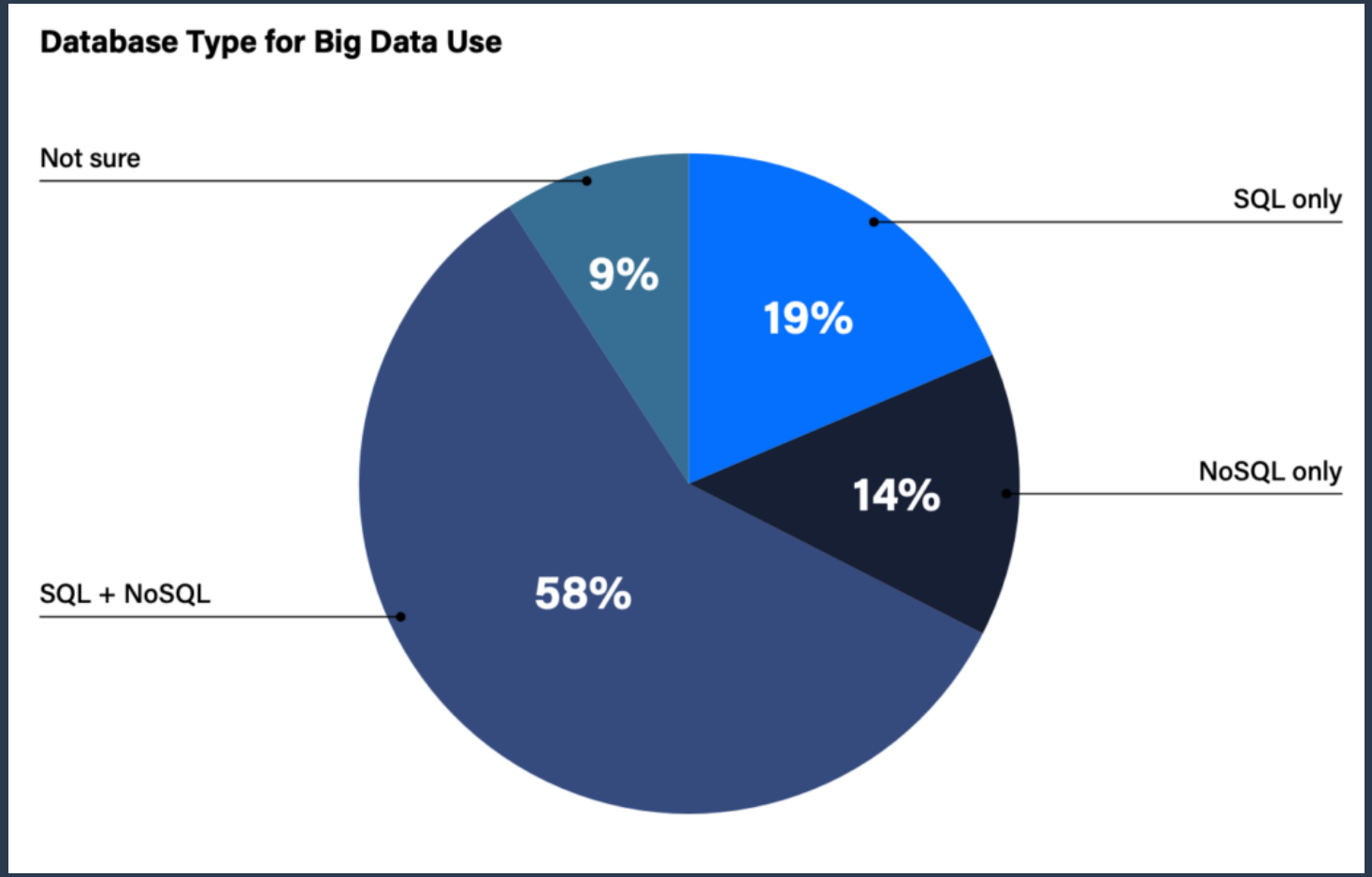
- Node.js: write asynchronous (non-blocking) code. Understand node platform to start a project.
- Express: setup express and get requests and send back responses. REST API.
- MongoDB: what NoSQL DB looks like. Full API interacting with DB.
- Angular: Investigate Angular and the architecture of an Angular application. Build a single-page application.
- MEAN application: Learn by example. We will create a MEAN Games application.

SQL vs NoSQL

Market Shares

NoSql vs. NewSQL vs Distributed SQL: DZone's 2020 Trend Report

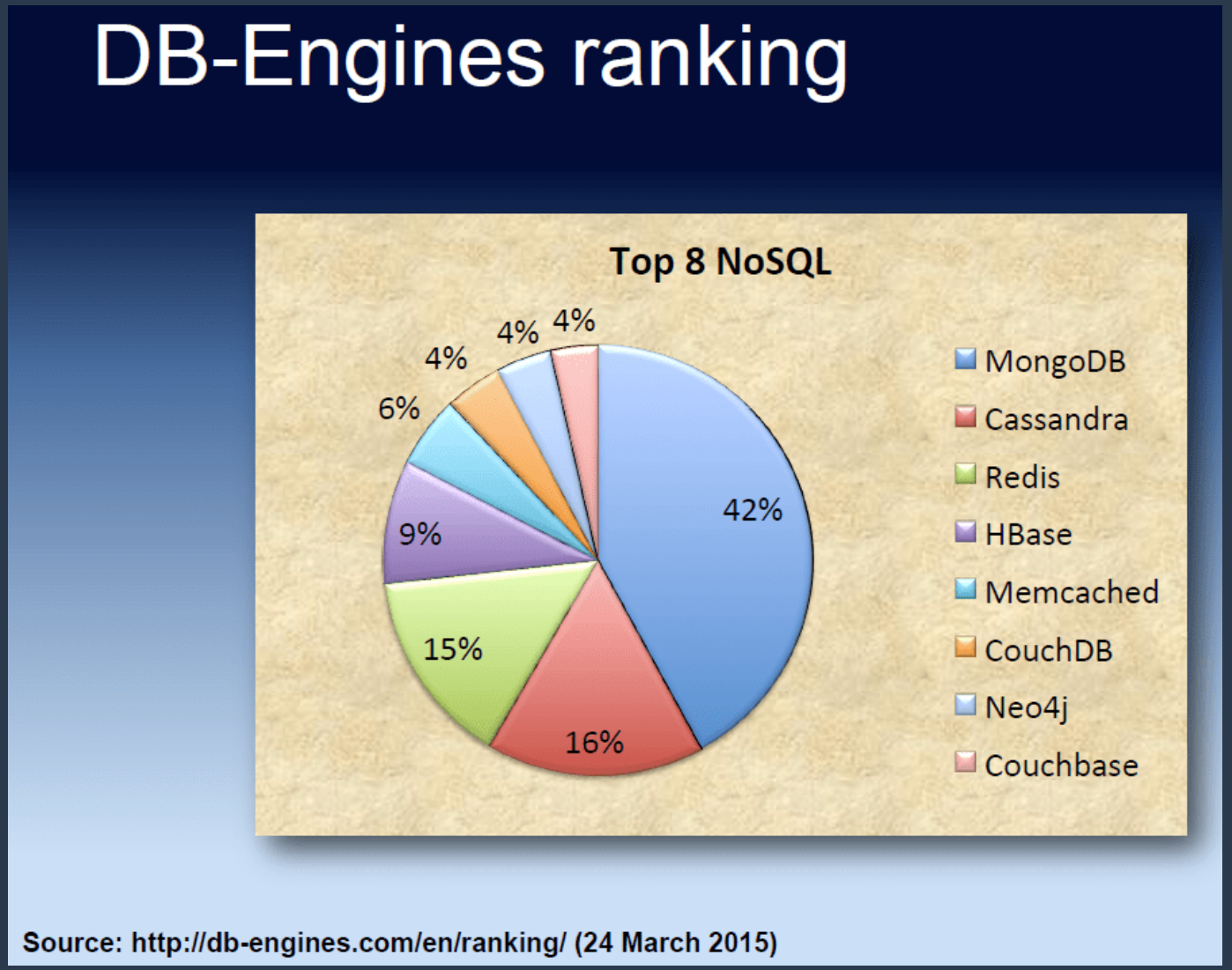
Written by Charlotte Dillon on Sep 9, 2020



https://www.cockroachlabs.com/blog/dzone-sql-trend/

NoSQL Databases

The NoSQL market size was valued at $2,410.5 million in 2018, and is projected to reach $22,087 million by 2026, growing at a CAGR of 31.4% from 2019 to 2026.

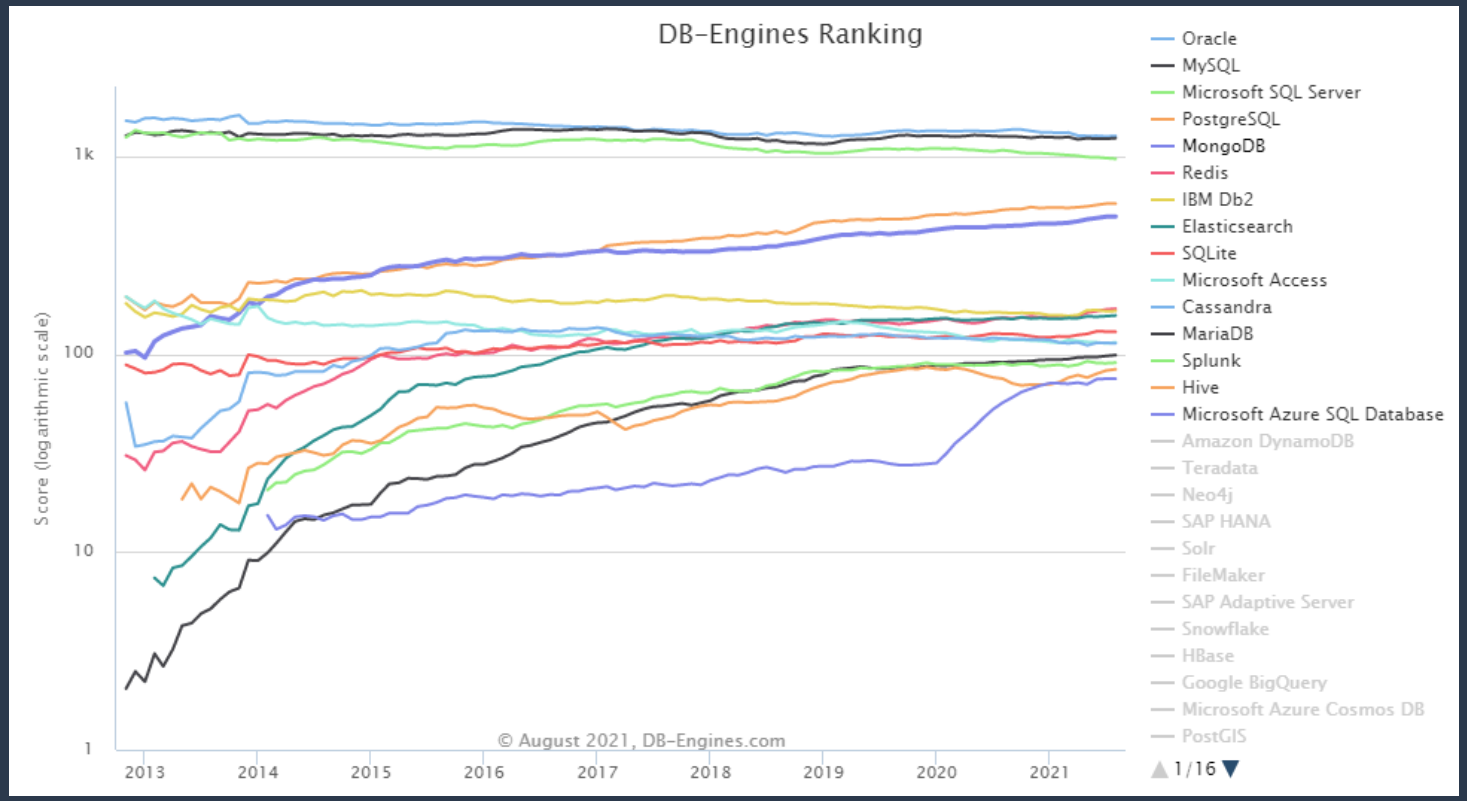


NoSQL Databases

DB-Engines Ranking – Trend Popularity.

August 2021

[historical trend of the popularity ranking of database management systems (db-engines.com)]



Introducing NoSQL-DB, MongoDB
Order is Present Everywhere

Wholeness

Data is the center of your application. The way data is presented impacts how it should be stored. Designing data storage to match its presentation creates more efficient applications. The Universe is structured in hierarchical layers from concrete expressions to their abstract basis, life is rich, and nature is efficient because of the underlying universal principles.

Introducing NoSQL-DB MongoDB
Order is Present Everywhere

1. What is MongoDB?
2. How to use MongoDB?
3. Best practices, and why?

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NoSQL DB

NoSQL Database Types

- Key-value store, ArangoDB
  - Store unique key and value, high scalability for caching (session management)
- Document store, MongoDB
  - Store semi-structured data in document format, no schema insert (mobile applications)
- Wide- column store, Amazon DynamoDB
  - Store in columns not rows, fast (catalogs, recommendation engines)
- Graph databases, Amazon Neptune
  - Store data as nodes and edges, show connections (reservation systems)
- More

Document Store vs Relational DB

RELATIONAL DB

STUDENT_ID	NAME	GPA
1	Jack	3.0
2	Jill	3.3
3	John	2.8

ID	COURSE_NAME	STUDENT_ID
1	Software Engineering	1
2	Web Programming	2
3	Algorithms	2

DOCUMENT STORE

```
[
 { "StudentID" : 1,
   "Name" : "Jack",
   "GPA" : 3.0,
   "Courses" : [
    { "ID" : 1,
      "CourseName" : "Software Engineering" } ] },
 { "StudentID" : 2,
   "Name" : "Jill",
   "GPA" : 3.3 ,
   "Courses" : [
    { "ID" : 2,
      "CourseName" : "Web Programming" },
    { "ID" : 3,
      "CourseName" : "Algorithms" } ] },
 { "StudentID" : 3,
   "Name" : "John",
   "GPA" : 2.8 }
]
```