COURSEWARE

MongoDB Introduction

Contents

Overview

This module dicusses what MongoDB is.

Database Type

MongoDB is a **document store**.
Document stores are *non-relational* databases - this means that each entry in the database (each 'document') represents a whole object rather than having objects spread across different tables.

Data Format

Documents in Mongo are stored in BSON (Binary JavaScript Object Notation) which, like JavaScript Object Notation, is a system that involves storing data in key-value pairs.
For example, a person could be represented in BSON as:

```
{
    "_id" : ObjectId("5e135963c3782165689e6142"),
    "firstName": "Tadas",
    "secondName": "Vaidotas",
    "occupation": "Trainer",
    "age": 33,
    "specialisation": "DevOps"
}
```

Structure

Collections

Documents are grouped into collections based on their subject.
For example, a 'people' collection might be used to store documents like the one above:

```
{
    "_id" : ObjectId("5e135963c3782165689e6142"),
    "firstName" : "Tadas",
    "lastName" : "Vaidotas",
    "age" : "33",
    "occupation" : "Trainer",
    "specialisation": "DevOps"
}
{
    "_id" : ObjectId("5e13599f9138596568d873ca"),
    "firstName" : "Jordan",
    "lastName" : "Harrison",
    "age" : "25",
    "occupation" : "Trainer"
}
```

While documents in a collection should have *something* in common, Mongo places no restriction on their structure.
Documents in a collection are flexible in composition - they might have identical fields, or basically nothing in common.

This leaves the composition of the data entered into that document entirely up to the person entering the data.
Notice how, in the example above, Tadas has a specialisation whereas Jordan does not.

Databases

Collections are grouped into **databases**.
Databases allow multiple applications to use the same Mongo instance whilst still keeping their respective collections nicely separated.

Why is it used?

- Fits nicely into a JavaScript-based tech stack as the JSON-like format makes it very accessible to developers.
- Less restrictive as documents don't have to follow a pre-set schema.
- Immensely scalable through a process known as **sharding**.

When should you use it?

- When your data has no fixed structure.
- There exist no strong relationships between different collections.

Tutorial

Installation

Windows

1. Download the windows binary from https://www.mongodb.com/download-center/community
2. Open Windows Explorer/File Explorer.
3. Change the directory path to where you downloaded the MongoDB .msi file. By default, this is %HOMEPATH%\Downloads.
4. Double-click the .msi file.
5. The Windows Installer guides you through the installation process.

Linux

Ubuntu

1. Update package repositories.
   ```
   sudo apt update
   ```
2. Install via apt
   ```
   sudo apt install mongodb -y
   ```

3. Check that the MongoDB server is active

```
systemctl status mongodb
```

Exercises

Open a command shell and access your MongoDB instance by entering the **mongo** command.