

## **#18-Spring Data JPA & H2 Setup**

### **Introduction to Spring Data JPA with H2 Database**

Our ultimate goal is to store data in a database rather than hardcode values and then retrieve them. To achieve this, we will integrate Spring Data JPA into our current project, starting with the H2 database, as it is already integrated with Spring Boot.

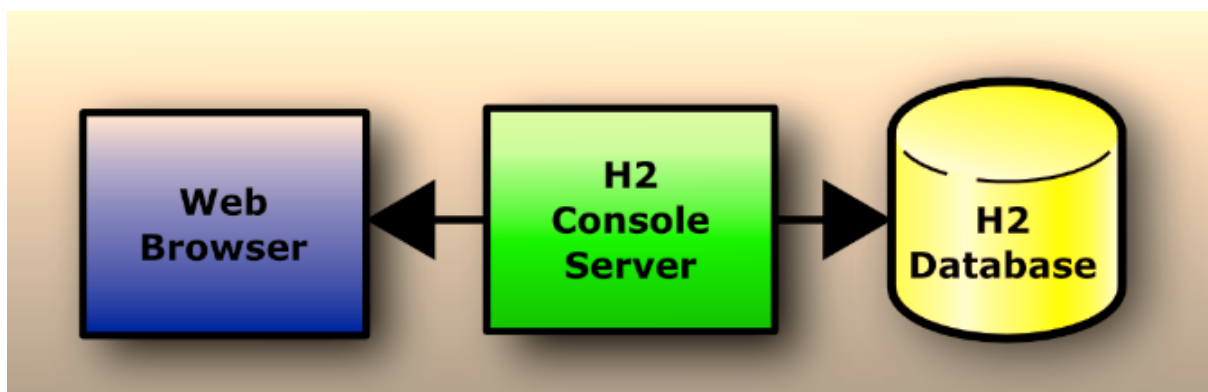
### **More about H2-Database:**

Designed for Spring Boot and built in Java, the H2 Database is a fast, lightweight, open-source relational database management system. Its simplicity and easy integration have made it a commonly used in-memory database for development and testing needs.

Running totally within the JVM's memory, the H2 Database boasts key characteristics that make in-memory databases particularly fast and perfect for testing.

Operating a stand-alone server or as an embedded application allows flexibility. Support for standard SQL and congruence with many database management systems.

Low minimum disc space requirements help to explain its lightweight character and simplicity of use.



### **Adding Dependencies**

To connect Spring Data JPA with the H2 database, we need to add the necessary dependencies to our project's pom.xml file. You can do this by visiting the [Spring Initializr](https://spring.io/projects/spring-initializr) website:

1. **Visit Spring Initializr:** Select the necessary dependencies that match your current project version.
2. **Copy Dependencies:** Copy the selected dependencies into your project's pom.xml file.

Alternatively, you can use the [Maven Repository](https://mvnrepository.com) to search for the required dependencies and add those dependencies.

The image shows two screenshots of the Maven Repository website. The top screenshot displays the page for 'Spring Boot Starter Data JPA 3.2.7'. The page includes a sidebar with 'Indexed Artifacts (37.5M)' and 'Popular Categories'. The main content area shows the artifact details, including the license (Apache 2.0), tags (persistence, data, spring, jpa, framework, starter), organization (VMware, Inc.), homepage (https://spring.io/projects/spring-boot), date (Jun 20, 2024), files (pom (2 KB), jar (4 KB)), repositories (Central), ranking (#202 in Maven Repository), and used by (2,516 artifacts). A note indicates a new version (3.3.1) is available. The bottom screenshot shows the page for 'H2 Database Engine 2.2.224'. It includes the same sidebar and main content area with details for the H2 database, including license (EPL 1.0, MPL 2.0), categories (Embedded SQL Databases), tags (embedded, database, sql, data, h2database), homepage (https://h2database.com), date (Sep 18, 2023), files (pom (1 KB), jar (2.5 MB)), repositories (Central), ranking (#64 in Maven Repository, #1 in Embedded SQL Databases), and used by (8,557 artifacts). Both screenshots show the Maven dependency code snippet at the bottom.

**Spring Boot Starter Data JPA 3.2.7**

Starter for using Spring Data JPA with Hibernate

License: Apache 2.0

Tags: persistence, data, spring, jpa, framework, starter

Organization: VMware, Inc.

HomePage: https://spring.io/projects/spring-boot

Date: Jun 20, 2024

Files: pom (2 KB), jar (4 KB) View All

Repositories: Central

Ranking: #202 in Maven Repository (See Top Artifacts)

Used By: 2,516 artifacts

Note: There is a new version for this artifact

New Version: 3.3.1

Maven Gradle Gradle (Short) Gradle (Kotlin) SBT Ivy Grape Leiningen Buildr

```
<!-- https://mvnrepository.com/artifact/org.springframework.boot/spring-boot-starter-data-jpa -->
<dependency>
  <groupId>org.springframework.boot</groupId>
  <artifactId>spring-boot-starter-data-jpa</artifactId>
  <version>3.2.7</version>
</dependency>
```

**H2 Database Engine 2.2.224**

A fast SQL database that can run embedded or a server mode with support for transactions, encryption, full search, etc. Storage can be disk-based or in-memory.

License: EPL 1.0, MPL 2.0

Categories: Embedded SQL Databases

Tags: embedded, database, sql, data, h2database

HomePage: https://h2database.com

Date: Sep 18, 2023

Files: pom (1 KB), jar (2.5 MB) View All

Repositories: Central

Ranking: #64 in Maven Repository (See Top Artifacts), #1 in Embedded SQL Databases

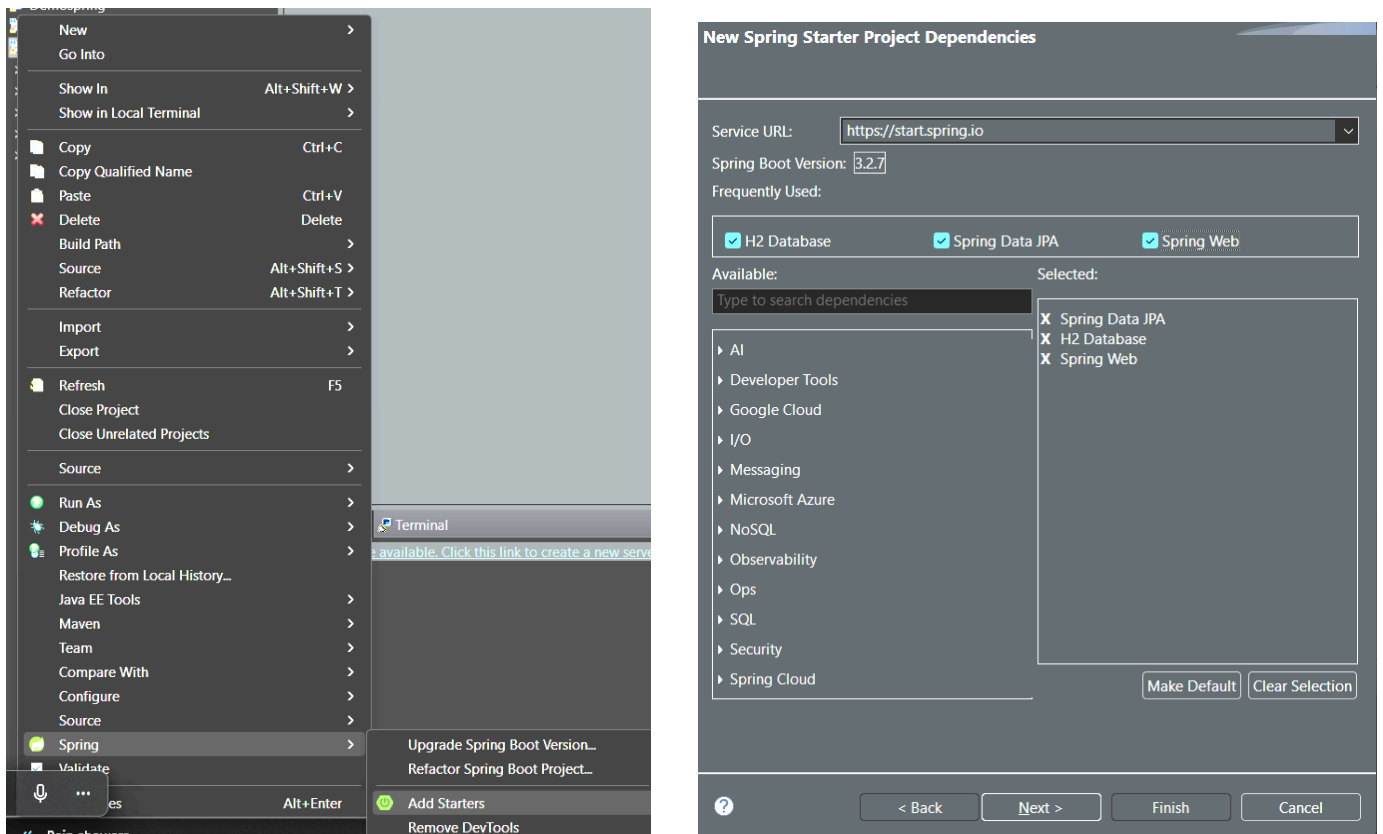
Used By: 8,557 artifacts

Maven Gradle Gradle (Short) Gradle (Kotlin) SBT Ivy Grape Leiningen Buildr

```
<!-- https://mvnrepository.com/artifact/com.h2database/h2 -->
<dependency>
  <groupId>com.h2database</groupId>
  <artifactId>h2</artifactId>
  <version>2.2.224</version>
  <scope>test</scope>
</dependency>
```

## Steps to Update a Project Using Eclipse IDE

1. **Access Project Menu:** Right-click on the project to open the drop-down menu.



2. **Add Starters:** Navigate to the Spring menu and select "Add Starters" to view options such as updating, refactoring, and adding starters.
3. **Include Dependencies:** Add the necessary dependencies to the project.
4. **Complete Setup:** Copy the dependencies that don't conflict with your existing pom.xml file.
5. **Refresh Project:** Update the project after refreshing it.

## Configuring the H2 Database

After setting up the project, run it to ensure everything is working correctly. You might encounter a "URL configuration" error because the application.properties file, located under the resources folder, requires the database URL to be specified.

```
Failed to configure a DataSource: 'url' attribute is not specified and no embedded datasource could be configured.  
Reason: Failed to determine a suitable driver class
```

### Add the following data to the properties file:

# H2 Database Configuration

spring.datasource.url=jdbc:h2:mem:telusko

spring.datasource.driverClassName=org.h2.Driver

```
SimplewebApp/pom.xml  SimplewebAppApplication.java  ProductController.java  application.properties ×  
1 spring.application.name=SimplewebApp  
2 spring.datasource.url=jdbc:h2:mem:telusko  
3 spring.datasource.driver-class-name=org.h2.Driver
```

### Moving Forward

With the setup complete, we will implement JPA and H2 in the next chapter. Till then, happy coding and continued learning.

