



CICLO 3

Desarrollo de **SOFTWARE**

Semana 4



Diego Iván Oliveros Acosta @scalapp.co



CICLO 3

De las clases a **las bases de datos**



PostgreSQL

Semana 4

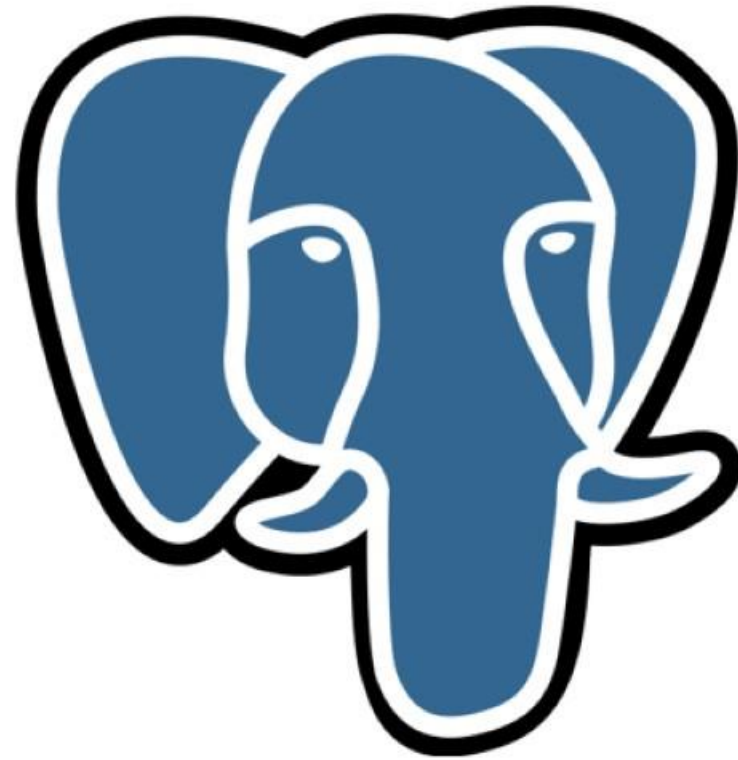
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Agenda

- PostgreSQL
 - ¿Qué es PostgreSQL?
 - ¿Para qué sirve?
 - Características e instalación
 - Ejercicio práctico (**Juego para aprender SQL**)
- Supabase
 - Introducción a Supabase
 - Ejercicio práctico
- Creación de una base de datos en PostgreSQL
 - Ejercicio práctico
- Entidades y repositorios en Spring Boot
 - Qué son las entidades en Java Spring Boot
 - Qué es un repositorio en Java Spring Boot
 - Trabajar con repositorios de datos de Spring

PostgreSQL

- ¿Qué es PostgreSQL?
- ¿Para qué sirve?
- Características e instalación
- Ejercicio práctico (**Juego para aprender SQL**)



Servidor PostgreSQL:

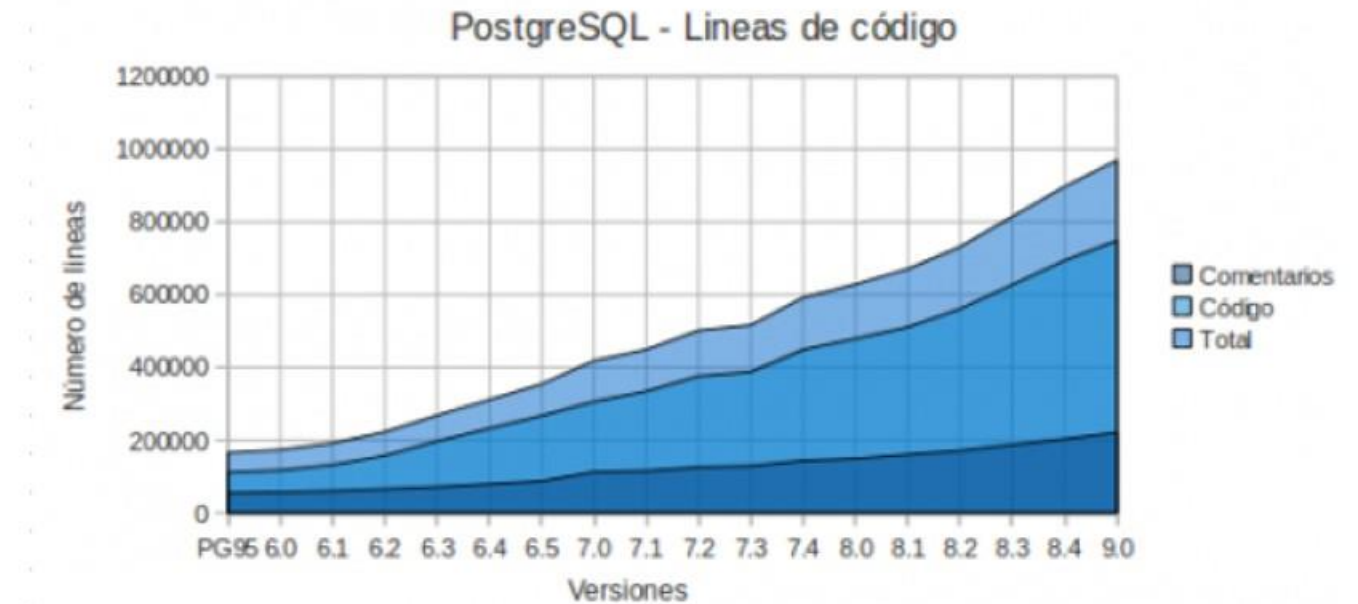
¿Qué es?

¿Para qué sirve?

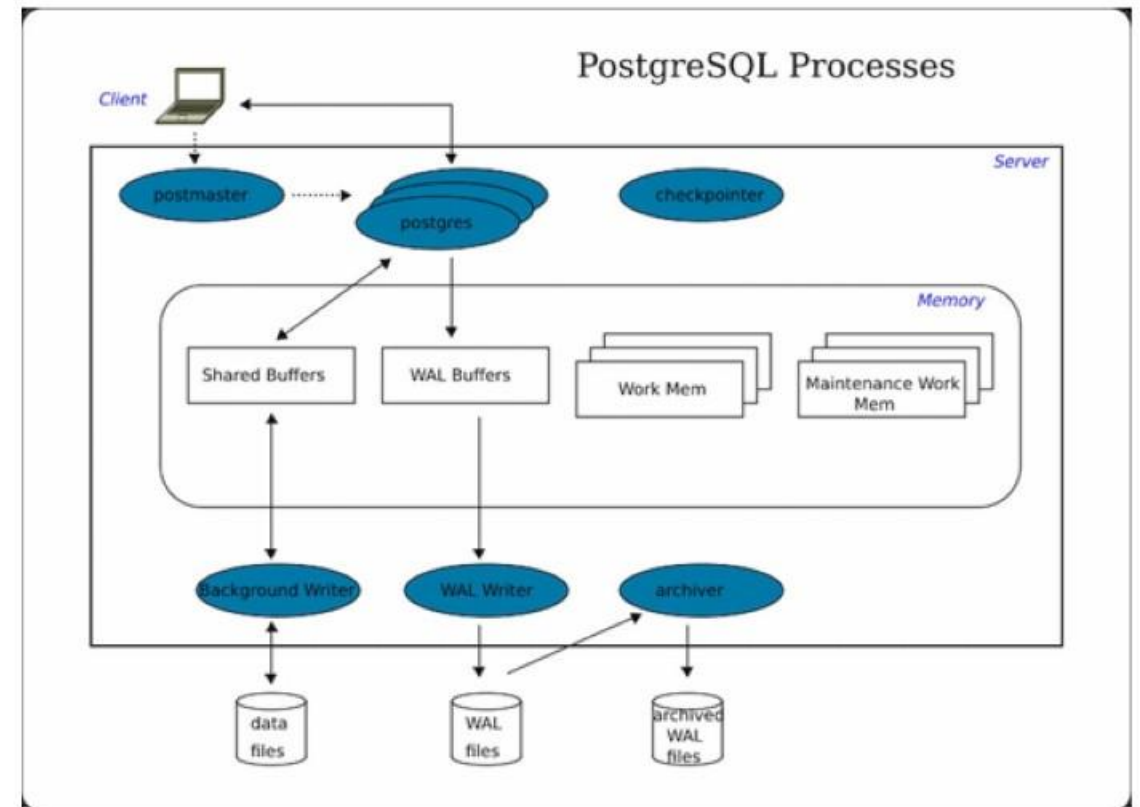
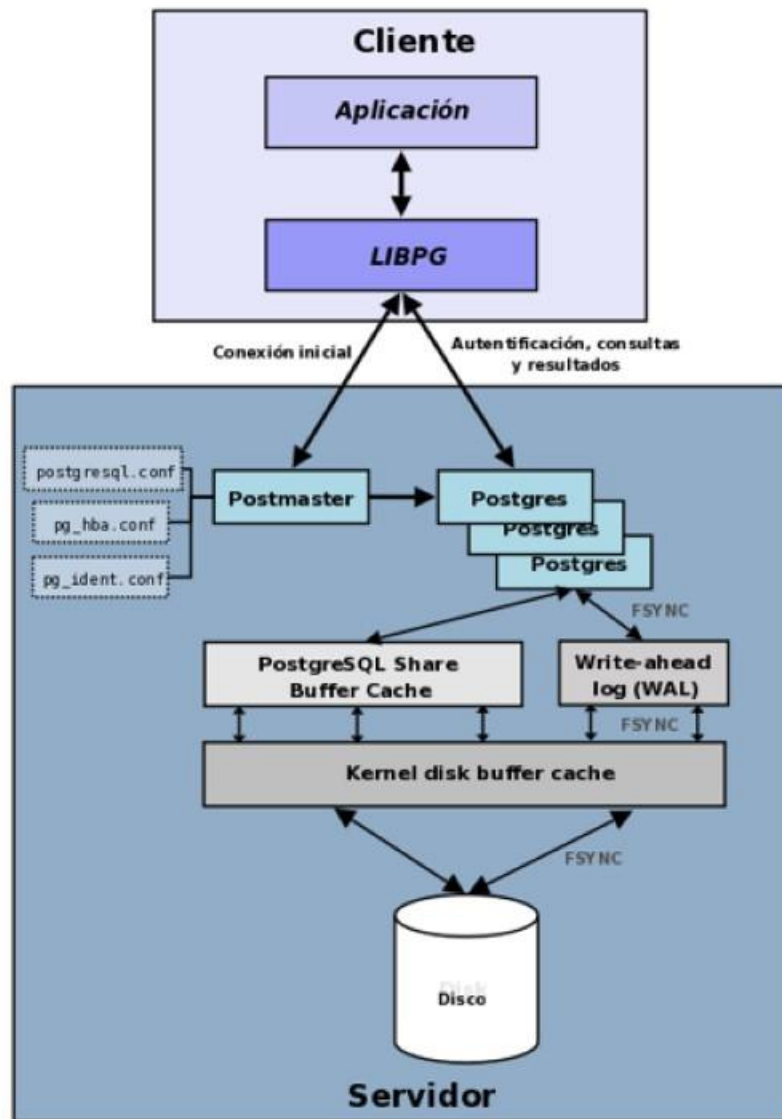


Características

- Es de código abierto
- Es gratuito
- Es multiplataforma
- Usabilidad
- Puede manejar un gran volumen de datos
- Soporte total de ACID



tem	Upper Limit	Comment
database size	unlimited	
number of databases	4,294,950,911	
relations per database	1,431,650,303	
relation size	32 TB	with the default BLCKSZ of 8192 bytes
rows per table	limited by the number of tuples that can fit onto 4,294,967,295 pages	
columns per table	1600	further limited by tuple size fitting on a single page; see note below
columns in a result set	1664	
field size	1 GB	
identifier length	63 bytes	can be increased by recompiling PostgreSQL
indexes per table	unlimited	constrained by maximum relations per database
columns per index	32	can be increased by recompiling PostgreSQL
partition keys	32	can be increased by recompiling PostgreSQL



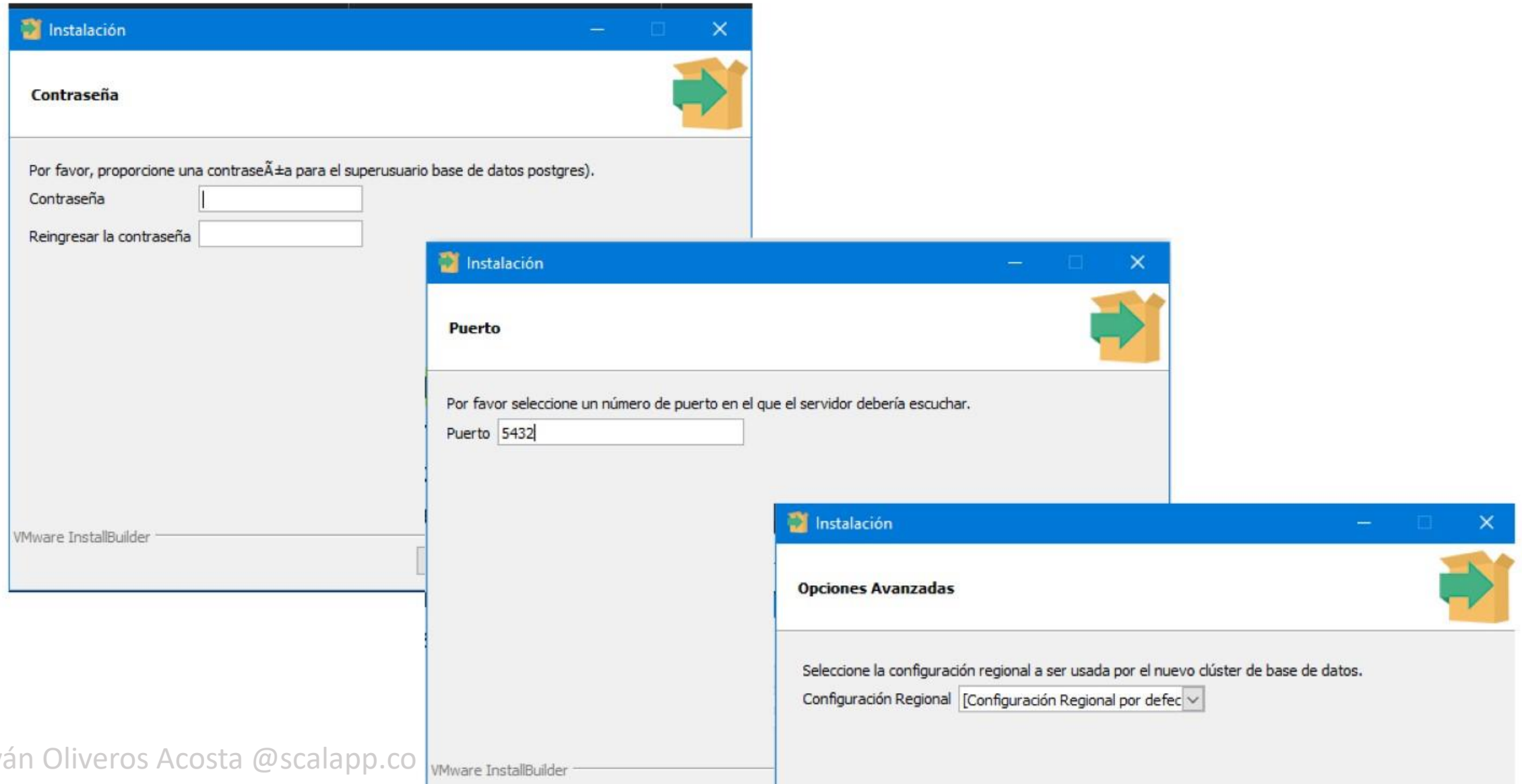
Download PostgreSQL

Open source PostgreSQL packages and installers from EDB

PostgreSQL Version	Linux x86-64	Linux x86-32	Mac OS X	Windows x86-64	Windows x86-32
14.5	postgresql.org ↗	postgresql.org ↗			Not supported
13.8	postgresql.org ↗	postgresql.org ↗			Not supported
12.12	postgresql.org ↗	postgresql.org ↗			Not supported
11.17	postgresql.org ↗	postgresql.org ↗			Not supported
10.22					

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Instalación



The image displays three overlapping windows from the VMware InstallBuilder application, each with a blue title bar and a green arrow icon in the top right corner. The windows are titled 'Instalación'.

Contraseña

Por favor, proporcione una contraseña para el superusuario base de datos postgres).

Contraseña

Reingresar la contraseña

VMware InstallBuilder

Puerto

Por favor seleccione un número de puerto en el que el servidor debería escuchar.

Puerto

VMware InstallBuilder

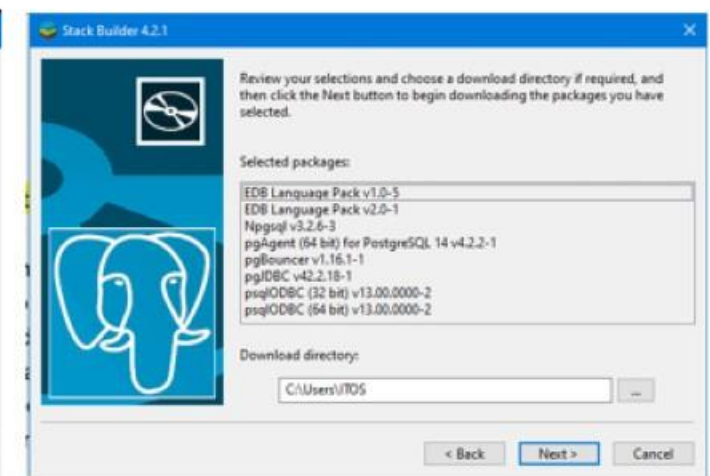
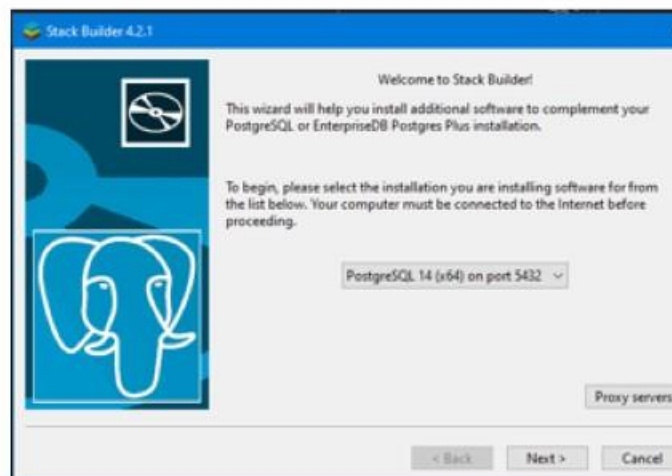
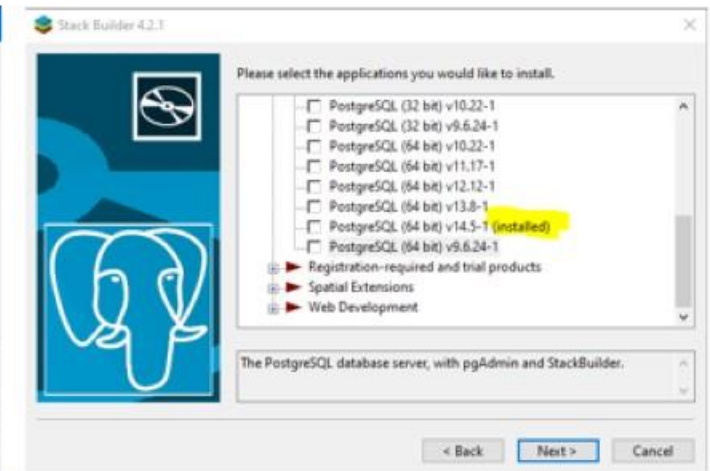
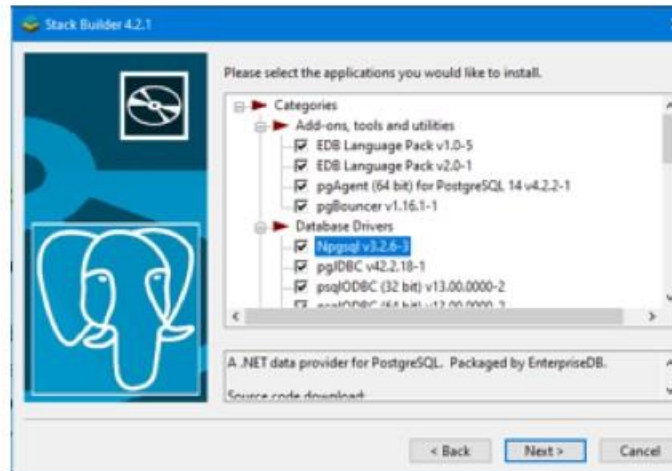
Opciones Avanzadas

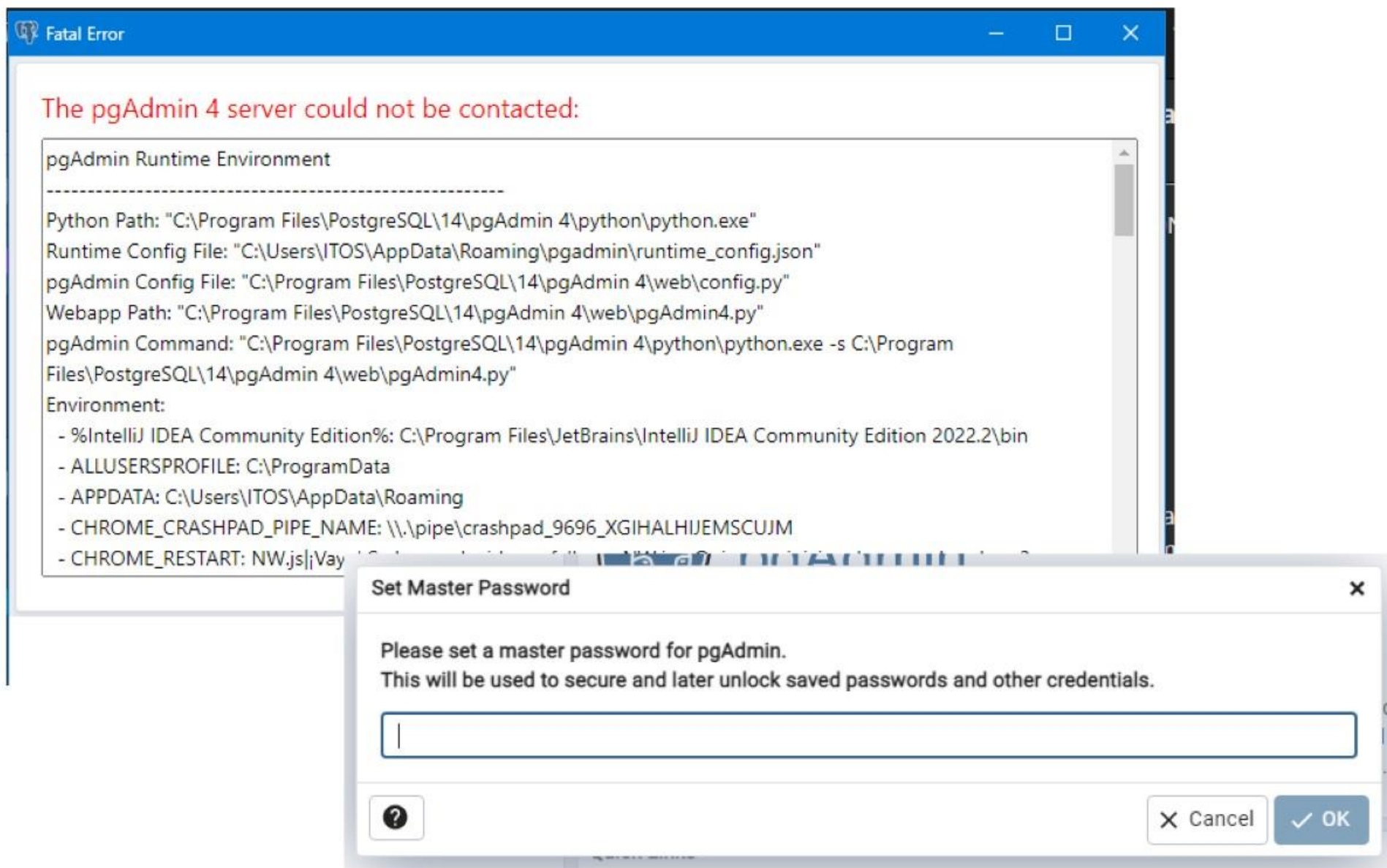
Seleccione la configuración regional a ser usada por el nuevo clúster de base de datos.

Configuración Regional

VMware InstallBuilder

- Add-ons, tools, utilities
- Database drivers
- PostgreSQL (64bit) v14.5-1







supabase

Supabase

Características

Autorización

Gestión de usuarios con seguridad de nivel de fila.

API generadas automáticamente

Genere instantáneamente API para su base de datos.

Base de datos

Una base de datos Postgres dedicada y escalable.

Funciones de borde

Funciones del lado del servidor, distribuidas globalmente.

Tiempo real

Cree con cambios de difusión, presencia y Postgres.

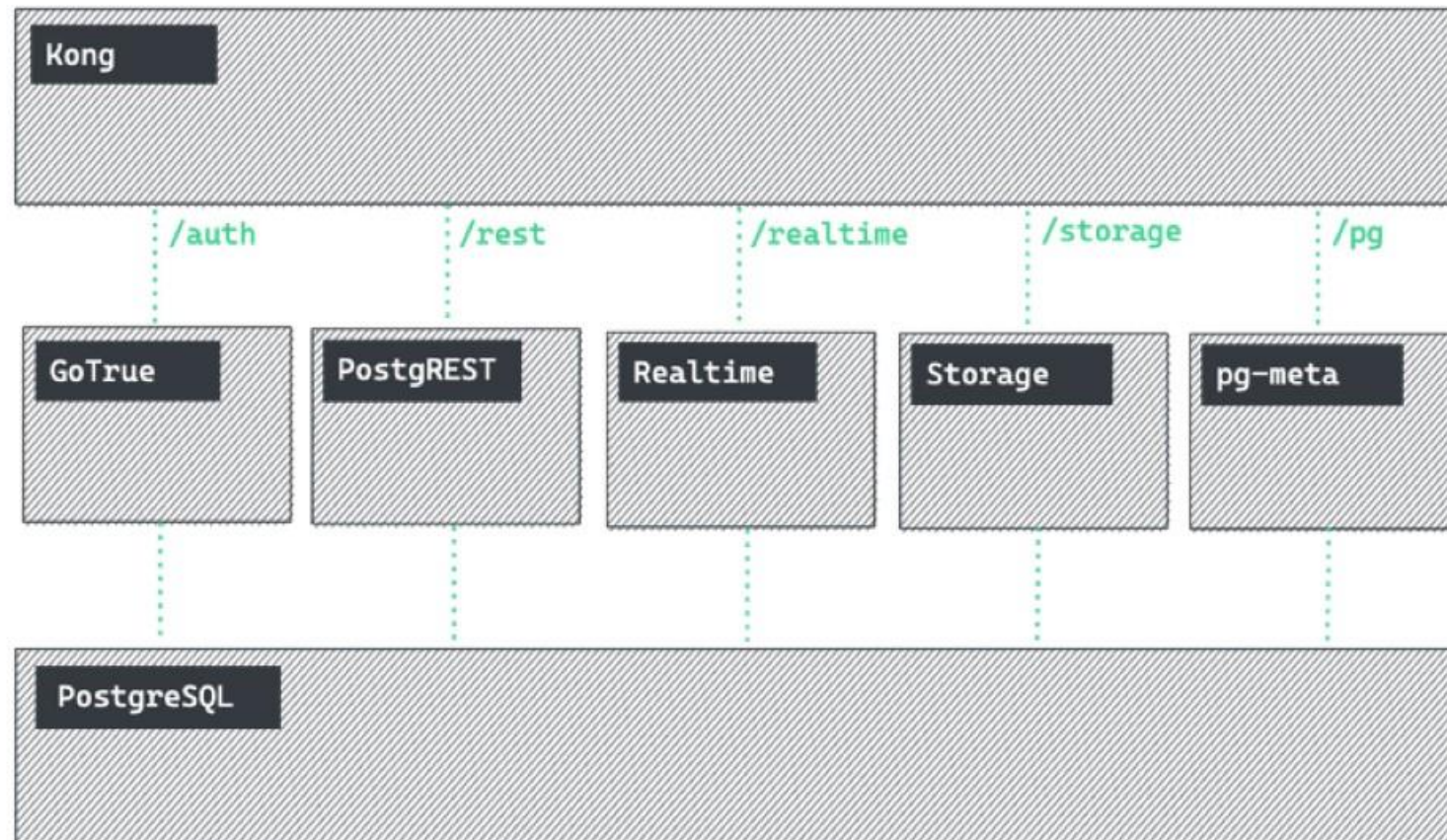
Almacenamiento de archivos

Almacene, organice y entregue archivos de gran tamaño.

Observabilidad

Supervise y depure su infraestructura.

Arquitectura



Create a new project

Your project will have its own dedicated instance and full postgres database.
An API will be set up so you can easily interact with your new database.

Organization



DiegOliveros's Org

Name

Project name

Database Password

Type in a strong password

This is the password to your postgres database, so it must be a strong password and hard to guess. [Generate a password](#)

Region



East US (North Virginia)

Select a region close to you for the best performance.

Pricing Plan


Free - \$0/month















Select a plan that suits your needs. [More details](#)


Cancel

You can rename your project later

Create new project


DiegoOliveros's Org / **superbase**



**Database**


Supabase is built on top of Postgres, an extremely scalable Relational Database.

[Table editor](#)[SQL editor](#)[Documentation](#)

**Auth**

Supabase makes it simple to manage your users.

[Try Auth](#)[Documentation](#)

**Storage**

Store and serve large files from multiple buckets.



[Try Storage](#)[Documentation](#)

Connecting to your new project

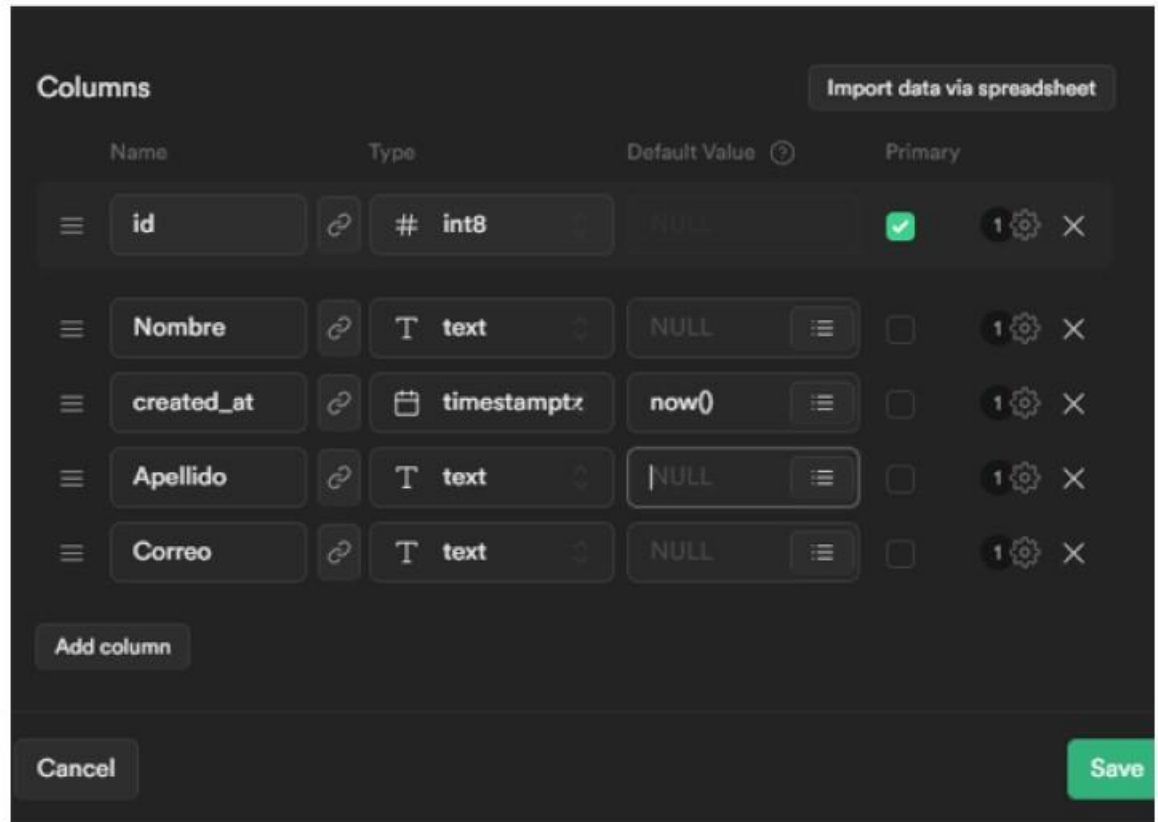
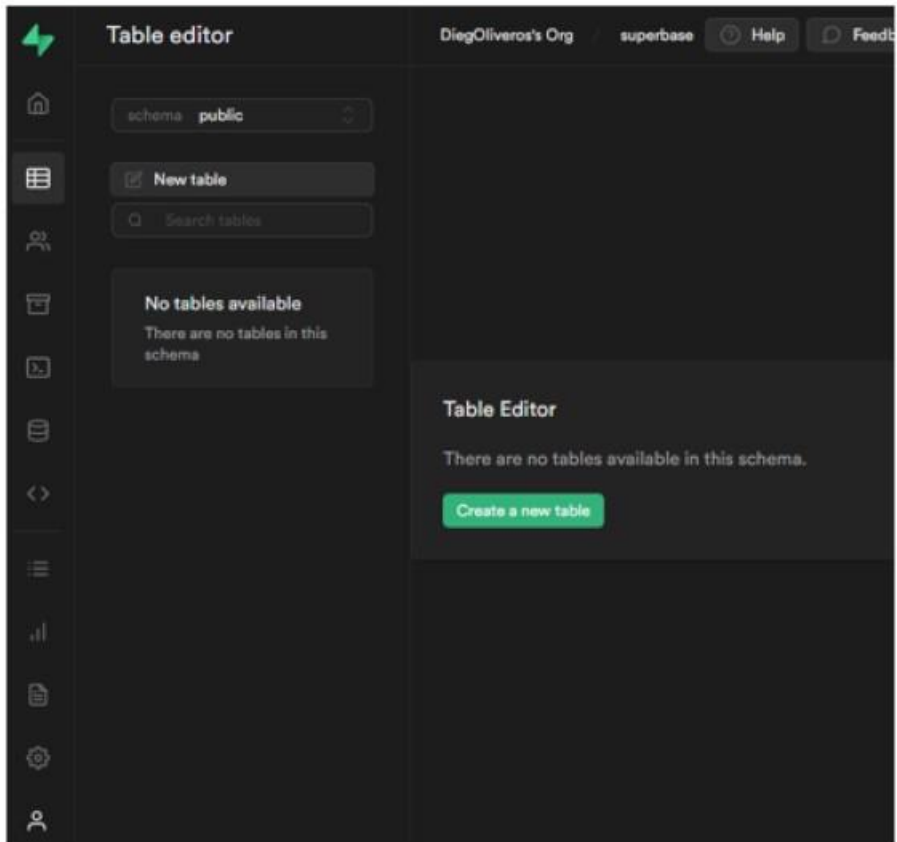
Your project has API keys for interacting with the database via Supabase client libraries.

Project API keys

Your API is secured behind an API gateway which requires an API Key for every request. You can use the keys below to use Supabase client libraries.

 [Help](#)[Feedback on this page?](#)

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Storage settings

Configure your project's storage settings

Upload file size limit

MB

Equivalent to 52.428.800 bytes. Maximum size in bytes of a file that can be uploaded is 5 GB (5,368,709,120 bytes).



Free Plan has a fixed upload file size limit of 50 MB.

Please upgrade to Pro plan for a configurable upload file size limit of up to 5 GB.

Upgrade to Pro

Cancel

Save

Taller



Connecting to PostgreSQL and documentation

- [React](#)
- [Angular](#)
- [Express](#)
- [Vue](#)
- [.NET](#)
- [Spring](#)
- [Flask](#)
- [Django](#)
- [Laravel](#)

¿Qué herramientas de persistencia tengo con spring framework?

JTA

- Java transacción API
- Soporta el manejo de transacciones tanto de forma declarativa como programado.

JDBC

- Java Database Connectivity
- Nos proporciona una capa de abstracción para acceder mediante SQL
- `String name= jdbctemplate.queryForObject("select name from estudiante where id=?",11L)`

R2DBC

- Reactive Relational Database Connectivity
- Nos da acceso a BD SQL utilizando patrones reactivos
- `Flux<String> names=client.sql("SELECT name FROM person").all();`

ORM

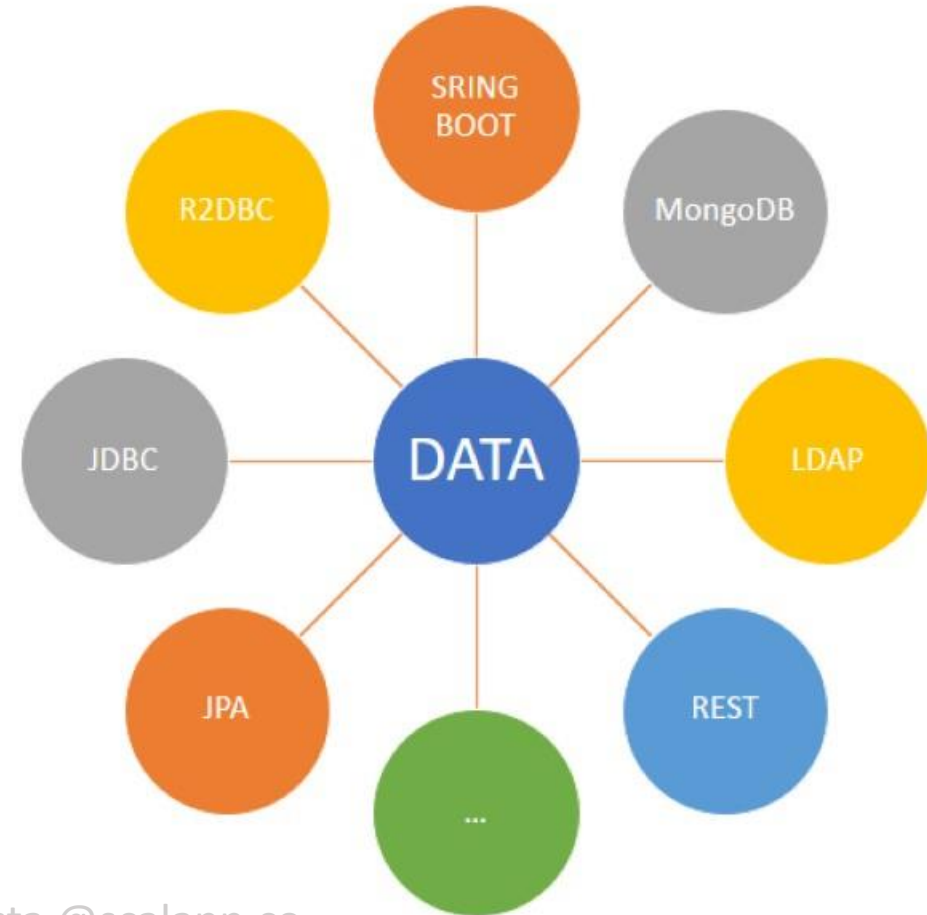
- Object Relational Mapping
- Soporta java persistence API(JPA) e Hibernate nativo

OXML

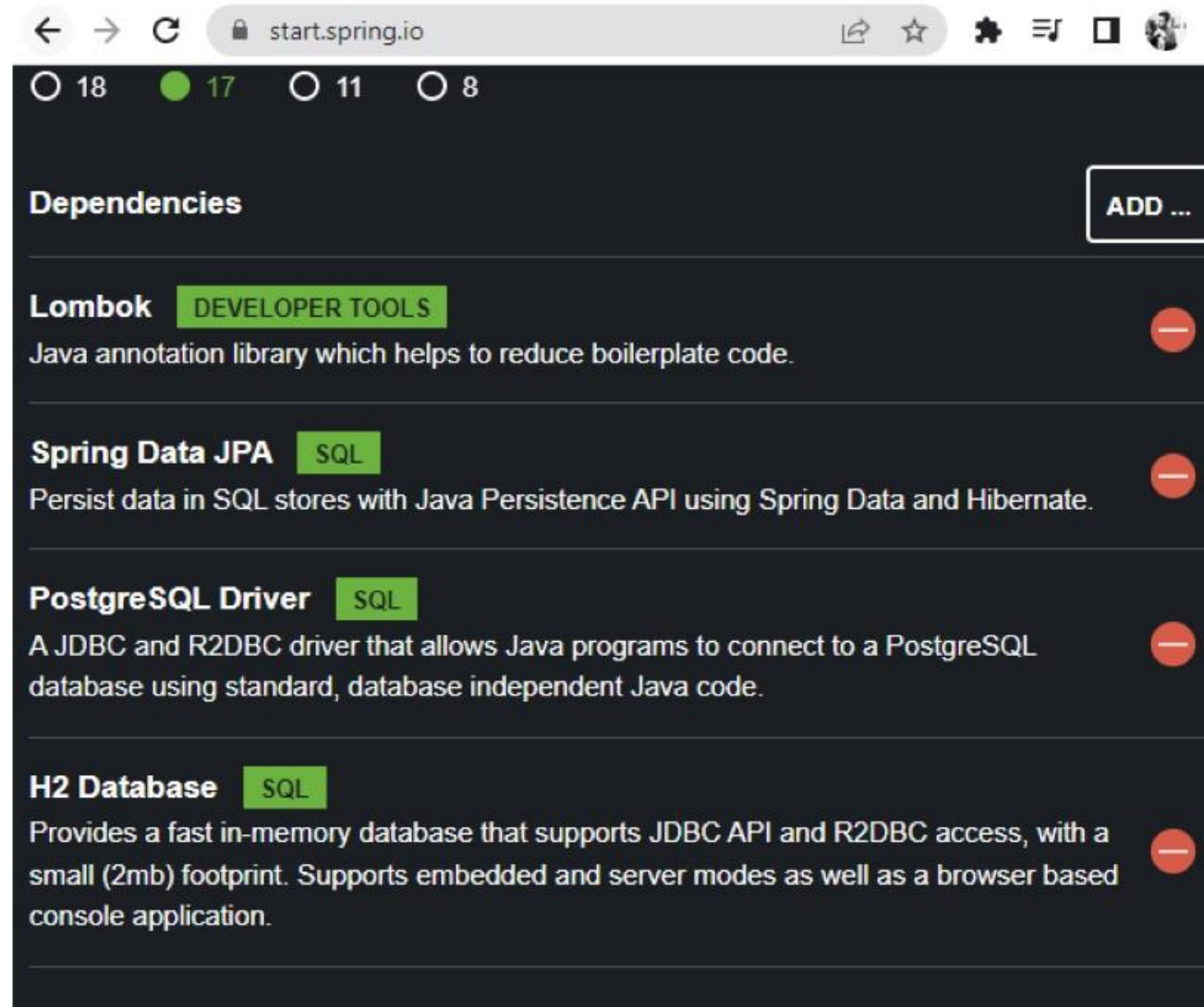
- Object –XML Mapping
- Nos proporciona la serialización XML (Maeshaller & Unmarsharshaller)

Spring Data

- Proporciona un modelo de acceso a datos de alto nivel
- DAO – Data Access Object
 - Ofrece implementación completa
- JPA – Java Persistence API
 - Interfaces: Javax persistence
 - Implementaciones: Hibernate, toptlink, OpenJPA, ObjectDB
- Mongo DB
 - Humongus:NoSQL, esquema libre
- BSON(Binary)



Dependencias



The screenshot shows a web browser window with the address bar displaying 'start.spring.io'. The browser's address bar includes navigation icons (back, forward, refresh) and a search icon. Below the address bar, there are four circular status indicators with numbers: 18 (white), 17 (green), 11 (white), and 8 (white). The main content area has a dark background and is titled 'Dependencies' in the top left corner. In the top right corner of this area is a button labeled 'ADD ...'. The list of dependencies includes:

- Lombok** (tagged **DEVELOPER TOOLS**): Java annotation library which helps to reduce boilerplate code.
- Spring Data JPA** (tagged **SQL**): Persist data in SQL stores with Java Persistence API using Spring Data and Hibernate.
- PostgreSQL Driver** (tagged **SQL**): A JDBC and R2DBC driver that allows Java programs to connect to a PostgreSQL database using standard, database independent Java code.
- H2 Database** (tagged **SQL**): Provides a fast in-memory database that supports JDBC API and R2DBC access, with a small (2mb) footprint. Supports embedded and server modes as well as a browser based console application.

Each dependency entry has a red circular icon with a white minus sign to its right.



Spring Boot Connect to PostgreSQL Database Examples

- proceso de creación de una aplicación que accede a datos basados en documentos a través de una interfaz RESTful [basada en hipermedia](#).

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Dependencias

Home » org.postgresql » postgresql



PostgreSQL JDBC Driver

PostgreSQL JDBC Driver Postgresql

License	BSD 2-clause
Categories	JDBC Drivers
Tags	database postgresql jdbc driver
Ranking	#119 in MvnRepository (See Top Artifacts) #2 in JDBC Drivers
Used By	3,517 artifacts



Spring Boot Starter Data JPA

Starter for using Spring Data JPA with Hibernate

License	Apache 2.0
Tags	persistence data spring jpa starter
Ranking	#231 in MvnRepository (See Top Artifacts)
Used By	1,847 artifacts

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>2.7.3</version>
</dependency>
```

☒ Include comment with link to declaration

Maven

Gradle

Gradle (Short)

Gradle (Kotlin)

SBT

Ivy

Grape

Leiningen

Buildr

```
<!-- https://mvnrepository.com/artifact/org.postgresql/postgresql -->
<dependency>
  <groupId>org.postgresql</groupId>
  <artifactId>postgresql</artifactId>
  <version>42.5.0</version>
</dependency>
```

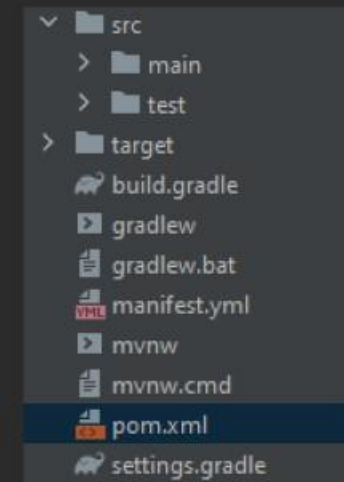
☒ Include comment with link to declaration

Copied to clipboard!

Dependencias

```
<!-- 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>2.7.3</version>
</dependency>

<!-- https://mvnrepository.com/artifact/org.postgresql/postgresql -->
<dependency>
  <groupId>org.postgresql</groupId>
  <artifactId>postgresql</artifactId>
  <version>42.5.0</version>
</dependency>
```



Java Spring Boot de clases a entidades

The image shows a screenshot of an IDE (likely IntelliJ IDEA) with a dark theme. On the left, a 'Connection info' dialog is open, showing the following details:

- Host: db.sizkysmxwecrty
- Database name: postgres
- Port: 5432
- User:
- Password:

The main IDE window displays the 'Project' view on the left, showing the project structure:

- src
 - main
 - java
 - com.example.demo
 - controllers
 - entities
 - Task
 - TaskList
 - repositories
 - services
 - DemoApplication

The 'resources' folder is expanded, showing 'application.properties' and 'test'.

The 'application.properties' file is open in the editor, showing the following configuration:

```
1 spring.datasource.url= jdbc:postgresql://db.sizkysmxwecrtywngge.supabase.co:5432/postgres
2 spring.datasource.username= postgres
3 spring.datasource.password= 1ASl1Ucb8C0keXXa
4 spring.jpa.properties.hibernate.dialect= org.hibernate.dialect.PostgreSQLDialect
5 # Hibernate ddl auto (create, create-drop, validate, update)
6 spring.jpa.hibernate.ddl-auto= create
```

The 'Task' and 'TaskList' classes are also visible in the 'entities' folder.

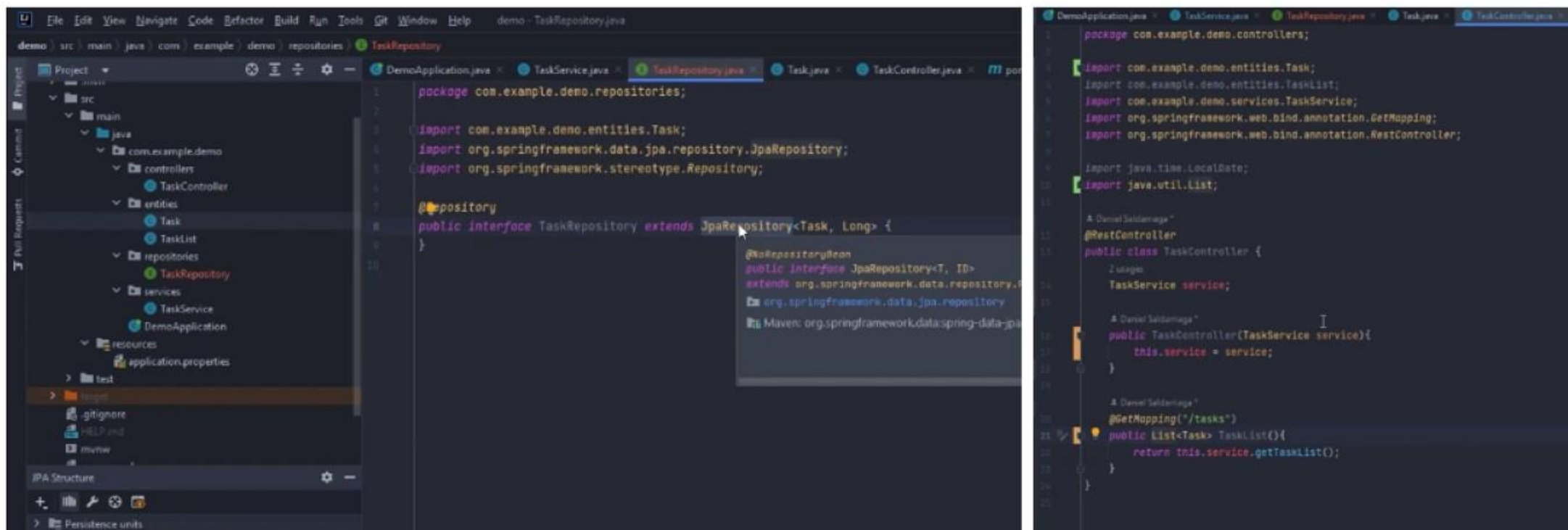
Convertir una clase java en una tabla en la base de datos.

```
new *  
public Task() {  
}
```

```
10 usages  Daniel Saldarriaga *  
@Entity  
@Table(name="task")  
public class Task {  
    @Id  
    @GeneratedValue(strategy = GenerationType.AUTO)  
    private long id;  
    @Column(name="description")  
    private String description;  
    @Column(name="done")  
    private Boolean done;  
    @Column(name="dueDate")  
    private LocalDate dueDate;  
  
    2 usages  Daniel Saldarriaga  
    public Task(String description, Boolean done, LocalDate dueDate) {  
        this.description = description;  
        this.done = done;  
        this.dueDate = dueDate;  
    }  
}
```

```
import javax.persistence.*;  
import java.time.LocalDate;  
  
10 usages  Daniel Saldarriaga *  
@Entity  
public class Task {  
    3 usages  
    private String description;  
    3 usages  
    private Boolean done;  
    3 usages  
    private LocalDate dueDate;  
}
```

Usar un repositorio para leer datos



```

import java.time.LocalDate;
import java.util.List;

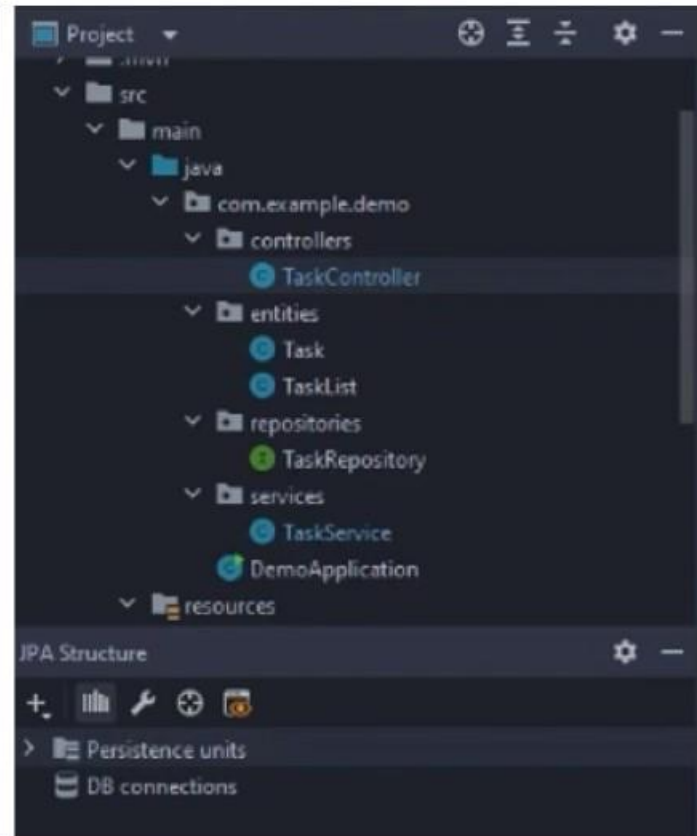
3 usages Daniel Saldarriaga
@Service
public class TaskService {
    3 usages
    private TaskRepository repository;

    Daniel Saldarriaga
    public TaskService(TaskRepository repository){
        this.repository = repository;
    }

    1 usage Daniel Saldarriaga
    public List<Task> getTaskList(){
        return this.repository.findAll();
    }

    new
    public Task createTask(Task newTask){
        return this.repository.save(newTask);
    }

```



```

import java.time.LocalDate;
import java.util.List;

Daniel Saldarriaga
@RestController
public class TaskController {
    3 usages
    TaskService service;

    Daniel Saldarriaga
    public TaskController(TaskService service){
        this.service = service;
    }

    Daniel Saldarriaga
    @GetMapping("/tasks")
    public List<Task> TaskList(){
        return this.service.getTaskList();
    }

    new
    @PostMapping("/tasks")
    public Task createTask(@RequestBody Task task){
        return this.service.createTask(task);
    }
}

```

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Escribir en la base de datos

Referencias

- <https://www.postgresql.org/>
- Spring Boot Connect to PostgreSQL Database Example
- <https://www.youtube.com/watch?v=GyFBp5v4tHY>
- Servidor PostgreSQL
- <https://blog.infranetworking.com/servidor-postgresql/>
- Documentación:
- <https://www.postgresql.org/docs/>
- <https://supabase.com/docs>
-