Connecting with Java

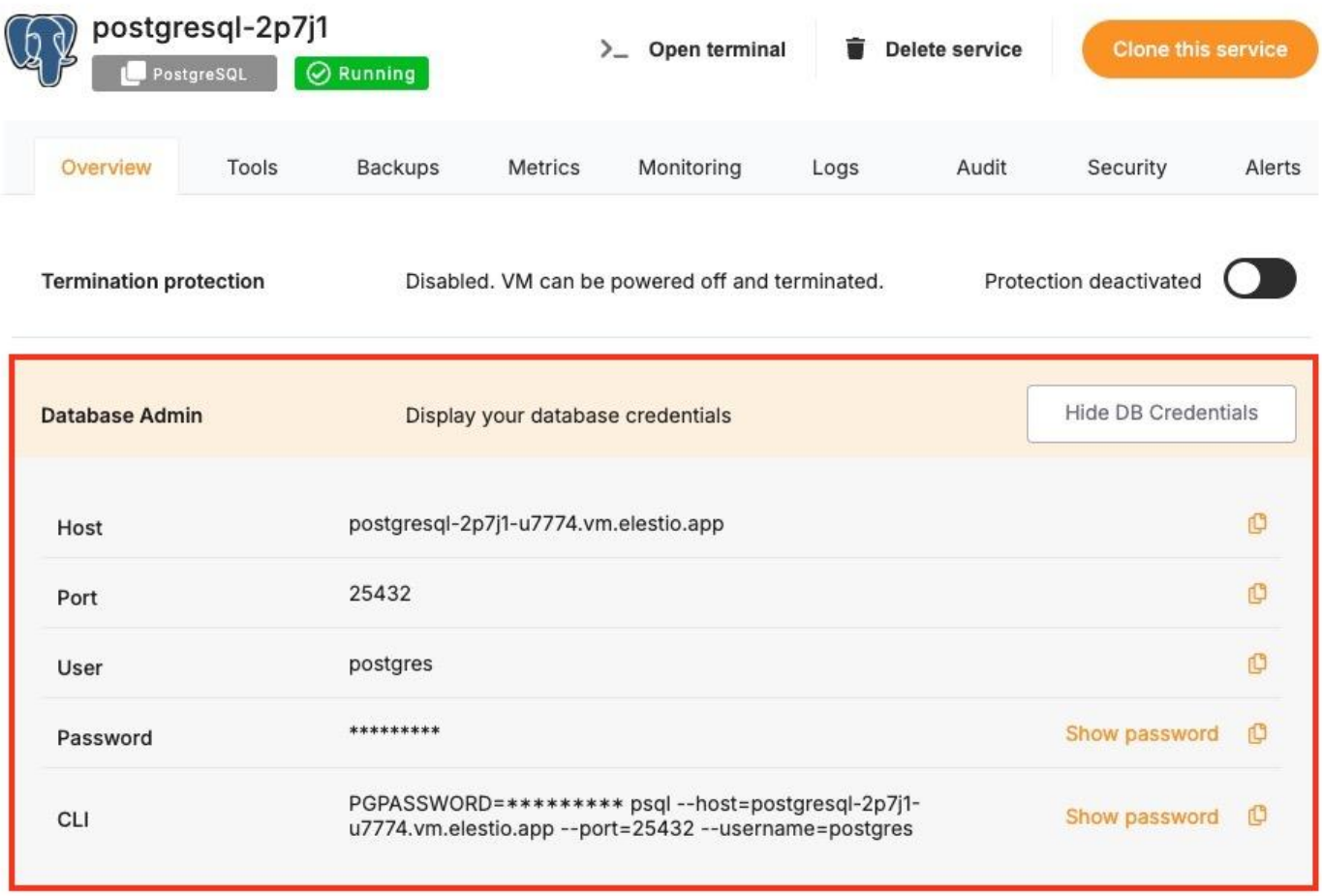
This guide explains how to establish a connection between a **Java** application and a **PostgreSQL** database using the **JDBC driver**. It walks through the necessary setup, configuration, and execution of a simple SQL query.

Variables

Certain parameters must be provided to establish a successful connection to a PostgreSQL database. Below is a breakdown of each required variable, its purpose, and where to find it. Here's what each variable represents:

Variable	Description	Purpose
`USER`	PostgreSQL username, from the Elestio service overview page	Identifies the database user who has permission to access the PostgreSQL database.
`PASSWORD`	PostgreSQL password, from the Elestio service overview page	The authentication key required for the specified `USER` to access the database
`HOST`	Hostname for PostgreSQL connection, from the Elestio service overview page	The address of the server hosting the PostgreSQL database.
`PORT`	Port for PostgreSQL connection, from the Elestio service overview page	The network port is used to connect to PostgreSQL. The default port is `5432`.
`DATABASE`	Database Name for PostgreSQL connection, from the Elestio service overview page	The name of the database being accessed. A PostgreSQL instance can contain multiple databases.

These values can usually be found in the Elestio service overview details, as shown in the image below. Make sure to take a copy of these details and add them to the code moving ahead.



Prerequisites

Install Java & JDBC driver

Check if Java is installed by running:

```
java -version
```

If not installed, install it first and then download and install **JDBC** driver from https://jdbc.postgresql.org/download/ or if you have Maven installed, run the following command with updated version of the driver:

```
mvn org.apache.maven.plugins:maven-dependency-plugin:2.8:get -
Dartifact=org.postgresql:postgresql:42.7.5:jar -Ddest=postgresql-42.7.5.jar
```

Code

Once all prerequisites are set up, create a new file named `Pg.java` and add the following code:

```
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.sql.Statement;
import java.util.HashMap;
import java.util.Map;

public class Pg {
    private static class ConnectionConfig {
        private final String host;
        private final String port;
        private final String database;
        private final String username;
        private final String password;

        public ConnectionConfig(String host, String port, String database, String username,
String password) {
            this.host = host;
            this.port = port;
            this.database = database;
            this.username = username;
            this.password = password;
        }

        public String getConnectionUrl() {
            return String.format("jdbc:postgresql://%s:%s/%s?sslmode=require", host, port,
database);
        }

        public boolean isValid() {
            return host != null && !host.isEmpty() &&
                   port != null && !port.isEmpty() &&
                   database != null && !database.isEmpty();
        }
    }

    private static Map<String, String> parseArguments(String[] args) {
        Map<String, String> config = new HashMap<>();
        for (int i = 0; i < args.length - 1; i++) {
```

```
            String key = args[i].toLowerCase();
            String value = args[++i];
            config.put(key, value);
        }
        return config;
    }

    private static ConnectionConfig createConfig(Map<String, String> args) {
        return new ConnectionConfig(
            args.get("-host"),
            args.get("-port"),
            args.get("-database"),
            args.get("-username"),
            args.get("-password")
        );
    }

    private static void validateConnection(Connection connection) throws SQLException {
        try (Statement stmt = connection.createStatement();
             ResultSet rs = stmt.executeQuery("SELECT version()")) {
            if (rs.next()) {
                System.out.println("Database Version: " + rs.getString("version"));
            }
        }
    }

    public static void main(String[] args) {
        try {
            // Load PostgreSQL driver
            Class.forName("org.postgresql.Driver");

            // Parse and validate configuration
            Map<String, String> parsedArgs = parseArguments(args);
            ConnectionConfig config = createConfig(parsedArgs);

            if (!config.isValid()) {
                System.err.println("Error: Missing required connection parameters (host, port,
database)");
                return;
            }
```

```
            // Establish connection and validate
            try (Connection conn = DriverManager.getConnection(
                    config.getConnectionUrl(),
                    config.username,
                    config.password)) {

                System.out.println("Successfully connected to the database!");
                validateConnection(conn);
            }

        } catch (ClassNotFoundException e) {
            System.err.println("Error: PostgreSQL JDBC Driver not found");
            e.printStackTrace();
        } catch (SQLException e) {
            System.err.println("Database connection error:");
            e.printStackTrace();
        }
    }
}
```

To execute the script, open the terminal or command prompt and navigate to the directory where `Pg.java`. Once in the correct directory, run the script with the command (Update the variables with actual values acquired from previous steps.)

```
javac Pg.java && java -cp postgresql-42.7.5.jar:. Pg -host HOST -port PORT -database DATABASE
-username avnadmin -password PASSWORD
```

If the connection is successful, the terminal will display output similar to:

```
Successfully connected to the database!
Database Version: PostgreSQL 16.8 (Debian 16.8-1.pgdg120+1) on x86_64-pc-linux-gnu, compiled
by gcc (Debian 12.2.0-14) 12.2.0, 64-bit
```

Revision #2
Created 2025-04-01 06:11:51 UTC
Updated 2025-05-07 15:35:50 UTC