Deployment: Spring Boot application with Postgresql database

# Configuring Java + Maven + Spring project for deployment

Add PostgreSQL driver as dependency in your project’s **pom.xml**. Copy and paste the below snippet, place it as a child element of **<dependencies>** element.

<dependency>

<groupId>org.postgresql</groupId>

<artifactId>postgresql</artifactId>

<scope>runtime</scope>

</dependency>

Create a file named **Dockerfile** (no file extension) in your coding project’s root. Content of the **Dockerfile** for a **Java + Maven** project is (use Copy + Paste):

FROM eclipse-temurin:17-jdk-focal as builder

WORKDIR /opt/app

COPY .mvn/ .mvn

COPY mvnw pom.xml ./

RUN chmod +x ./mvnw

RUN ./mvnw dependency:go-offline

COPY ./src ./src

RUN ./mvnw clean install -DskipTests

RUN find ./target -type f -name '\*.jar' -exec cp {} /opt/app/app.jar \; -quit

FROM eclipse-temurin:17-jre-alpine

COPY --from=builder /opt/app/\*.jar /opt/app/

EXPOSE 8080

ENTRYPOINT ["java", "-jar", "/opt/app/app.jar" ]

The above content is a generalized **Dockerfile** configuration and can be used for other Spring Boot projects.

Create a new deployment profile for your application. You need to create a new file in the  
**<your app>/src/main/resources/** directory.

Name the new file **application-rahti.properties**.

Content of the **application-rahti.properties** is (use Copy + Paste):

spring.datasource.url=jdbc:postgresql://${POSTGRESQL\_SERVICE\_HOST}:${POSTGRESQL\_SERVICE\_PORT}/${DB\_NAME}

spring.datasource.username=${DB\_USER}

spring.datasource.password=${DB\_PASSWORD}

spring.jpa.show-sql=true

spring.jpa.generate-ddl=true

spring.jpa.hibernate.ddl-auto=update

Commit the above changes and push them to your GitHub repository.

# Creating a project in CSC

**NOTE!** If you already have created a project in CSC, you are unable to create another one. In that case proceed to chapter 3 of these instructions.

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Login to CSC at <https://my.csc.fi/login> using you Haka user account (Haaga-Helia credentials) or your CSC user account (username sent to your email). Navigate to Projects view and start creating a new project.

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Fill in your project’s information as instructed in the form. Read and accept all terms of use and privacy notice. Choose **Create project** to continue.

You have now created your CSC project. Within this project you can start adding CSC’s services. For your deployment you only need **Rahti – Container Cloud**. Click **Add services** and select **Rahti**.

**NOTE: check your project number. You will need it later!**

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Once you have added the **Rahti** service you might have to wait up to 60 mins for you to gain access after activation. So be patient!

# Creating a project in Rahti

After you have gained access to **Rahti** service, you can login to **Rahti** at your CSC project’s **Projects** view. Choose your (only) project and scroll down to **Services**. Clicking **Login** will take you to **Rahti** landing page.

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Proceed the login process, you need to click **Login** buttons a few times in different pages. Use either Haka or CSC as your authentication method when prompted.

Successfully logging in directs you to **Rahti** console. When starting the console for the first time take the site’s tour showing important navigation options. After the tour you are ready to create your **Rahti** **project**.

Click the **Project: All projects** dropdown menu and choose **Create Project** or click the text **Create a Project**. If you don’t have these options visible in your page, make sure you are in **Developer** view (marked with yellow).

**NOTE!** You can have more than one **Rahti projects** in one **CSC Project**.

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Give your project a name and a display name. In the description write **csc\_project:<your CSC project number>**. You will find your **CSC project number** in your CSC Project’s **Project information** view. Proceed by clicking **Create**.

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Next you will import your code from a Git repository. The following instructions assume that you have set your GitHub repository **Public**.

In **Rahti** dashboard make sure you are in **Developer** view: go to **+Add** page and choose **Import from Git**.

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Copy and paste your GitHub repository’s URL into the corresponding form field and choose **Dockerfile** as your **Import Strategy** if it is not the suggested one. You can leave rest of the form fields to their default values. Move on to **Create**.

**NOTE! Rahti** might not detect the **Dockerfile** if it is not in your GitHub project’s root. In this case open **Show advanced Git options** under **Git Repo URL** form field. In **Context dir** form field update the value to the name of the subdirectory that contains **pom.xml** and **Dockerfile**.

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Successful creation will take you to your project’s **Topology** view. Click the graphical representation of your deployment to open your deployment controls.

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You have now deployed your application into **Rahti**. But it is not in working condition yet. The **Crash Loop BackOff** error is due to the build’s trials of connecting to a database that doesn’t exist trying to use environment variables that haven’t been declared. (You might have to wait a minute to get the error).



In **Developer** view, go to **+Add** page and start creating a database for your project. Choose **PostgreSQL**. Make sure you don’t select the Ephemeral version! Click **Instantiate Template** to continue the process.

You can leave all the default values in the form where you create your database. Leaving **PostgreSQL Connection Username** and **Password** empty will make the system generate random credentials for you. This is fine within the scope of Haaga-Helia UAS course work.

If you want to specify **PostgreSQL Connection Username** and **Password**, **don’t use weak a password! Always use strong passwords even when practicing!**

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Successful creation of a database will show as a new **DeploymentConfig** object in your **Topology** view.

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You still need to configure the environmental variables before your application’s deployment is finished.

In **Administrator** view: **Workloads** 🡪 **Deployments** 🡪 **<your deployment>** 🡪 **Environment**.

Set your environment variables as shown below. Click the circled **Add from ConfigMap or Secret** to get more form fields. Click **Save** at the bottom of the page to activate your changes.

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Congratulations! You have now deployed your Spring application with a proper database to CSC/Rahti!

To get the URL for your app go back to **Developer** view 🡪 **Topology**. Click your application’s **Open URL** shortcut or navigate to deployment’s quick controls (navigation pane on the right) and scroll down to **Routes**. It might take few minutes before you are able to access your deployment’s URL in browser.

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