Going Native

In this section you will:

- Learn what GraalVM is, and what is a native build
- Build a native image of your applications (optional)
- Update our application deployments to use the native image version
- Load test them

What is GraalVM

GraalVM is a new technology, allowing for the creation of a native build of a Java application; your application will be compiled to a native executable, and will not need a JVM to run. That executable will be specific to your operating system, and will start much faster than with a JVM.

You can find more information on GraalVM at https://www.graalvm.org/ (https://www.graalvm.org/).

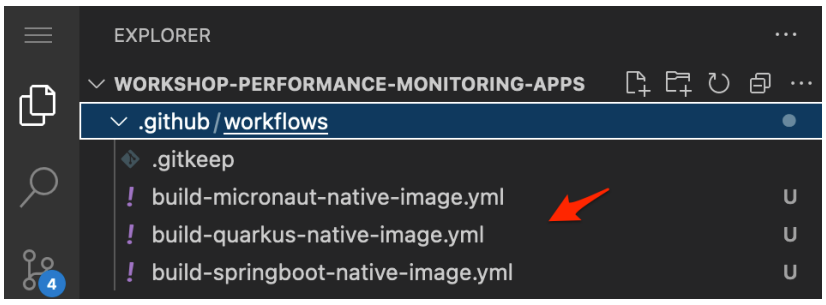
> Red Hat provides downstream release of GraalVM called **Mandrel** (https://github.com/graalvm/mandrel), focused on native image compilation of **Java applications in Red Hat-backed projects**. As such, it is not a GraalVM native-image replacement for all users. For instance, Mandrel does not ship with polyglot or LLVM toolchain support, which some use cases might require. However, Red Hat engineers contribute to upstream GraalVM and work hard to stay up-to-date with upstream GraalVM code. For more details on Mandrel distribution and its use on Java Application (using Quarkus) checkout this article (https://developers.redhat.com/blog/2021/04/14/mandrel-a-specialized-distribution-of-graalvm-for-quarkus).

> Because native builds are much slower than JVM builds and are resource intensive (cpu and mem) we won't execute them in this Lab. There are guides showing how you can setup a GraalVM environment to create a native-executable for each of the modern cloud-native java runtimes we've been using in this Lab.
>
> For instance if you are interested in know how to create a native-executable for your Quarkus App checkout this guide in Quarkus.io. (https://quarkus.io/guides/building-native-image)

Building native image using Github Actions

> Again, due to our Lab session time constraint, we already built all the three apps' native images and made them available for you in our Quay.io Organization:
>
> ```
> quay.io/redhat_na_ssa/quarkus-app-native
> quay.io/redhat_na_ssa/micronaut-app-native
> quay.io/redhat_na_ssa/springboot-app-native
> ```
>
> **Feel free to skip this build step and then go straight to the next section to update your service's deployment pointing to our registry.**

To build native images of our 3 microservices, we will use a pre-configured **GitHub Action workflow** (https://docs.github.com/en/actions) already created for you inside your git repo. There three workflow definitions inside `$PROJECT_SOURCE/.github/workflows`:



Each one can be used to manually trigger its respective application native image build using Github infrastructure. For instance, lets trigger the workflow to build a native image for our Quarkus app.

1. First you need to define two Github Secrets in your repo.
   - from your github account, open our repo and click the `Settings` tab
   - at the left menu open `Secrets and variables` , then `Actions`