

Vert.x Maven Plugin

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Vert.x Maven Plugin

| | |
|---|----|
| 1. Introduction | 2 |
| 1.1. Using the plugin | 2 |
| 1.2. Packaging | 3 |
| 1.3. Running | 4 |
| 1.3.1. In foreground using vertx:run | 4 |
| 1.3.2. In background using vertx:start | 4 |
| 2. Common Configurations | 5 |
| 3. Common Run Configurations | 6 |
| 4. Maven Goals | 7 |
| 4.1. vertx:setup | 7 |
| 4.1.1. Example | 7 |
| 4.2. vertx:initialize | 7 |
| 4.2.1. Configuration | 7 |
| 4.2.2. Redeployment | 8 |
| 4.3. vertx:package | 8 |
| 4.3.1. Configuration | 8 |
| 4.4. vertx:run | 8 |
| 4.5. vertx:start | 9 |
| 4.6. vertx:stop | 9 |
| 5. Example Configurations | 11 |
| 5.1. vert.x:package Examples | 11 |
| 5.1.1. Webjars and javascript dependencies | 11 |
| 5.1.2. Using full names for webjars and javascript dependencies | 12 |
| 5.2. vert.x:start Examples | 13 |
| 5.2.1. start goal with custom java options | 14 |
| 5.2.2. stopping one or more applications | 15 |
| 6. How does the redeploy work | 16 |
| 6.1. References | 16 |

Chapter 1. Introduction

[Eclipse Vert.x](#) is a toolkit to build reactive and distributed systems on the top of the JVM. Vert.x applications can be developed in multiple languages such as Java, JavaScript, Groovy, Scala, Kotlin, Ceylon, Ruby... As a toolkit, Vert.x is un-opinionated.

The `maven-vertx-plugin` is a plugin for Apache Maven for packaging and running Vert.x applications. The plugin tries provide an opinionated way to build Vert.x application:

- applications are packaged as a *fat* jar (containing your code and all the dependencies including Vert.x)
- the application is configured with an `application.json` file or an `application.yml` file (translated to json).

The last version of the Vert.x Maven Plugin is **0.1-SNAPSHOT**.

1.1. Using the plugin

The plugin provides a set of goals such as:

- `setup` - add the Vert.x Maven Plugin to your `pom.xml`
- `initialize` - manage *js* dependencies and *webjars*, also initiates the redeployment
- `package` - package your Vert.x application as a *fat* jar
- `run` - run your application
- `start / stop` - start your application in background / stop it

Generally, you will use the following configuration:

```

<project>
  ...
  <build>
    <plugins>
      ...
      <plugin>
        <groupId>io.fabric8</groupId>
        <artifactId>vertx-maven-plugin</artifactId>
        <version>${version}</version>
        <executions>
          <execution>
            <id>vmp</id>
            <goals>
              <goal>initialize</goal>
              <goal>package</goal>
            </goals>
          </execution>
        </executions>
        <configuration>
          <redeploy>true</redeploy>
        </configuration>
      </plugin>
      ...
    </plugins>
  </build>
  ...
</project>

```

1.2. Packaging

This plugin packaged the Vert.x application as a fat or über jar. These jars are executable, and so can be launched using: `java -jar <my-app.jar>`. The packaging process adds certain **MANIFEST.MF** entries that control how the application is launched. The plugin takes care of adding the required entries to the **MANIFEST.MF** with values configured using the [Common Configuration](#)

The following are the Manifest entries that will be added based on the configuration elements:

Table 1. Package configuration

| Property | Manifest Attribute | Remarks |
|----------------|--------------------|---|
| vertx.verticle | Main-Verticle | The main verticle, i.e. the entry point of your application. Used when the Main-Class is <code>io.vertx.core.Launcher</code> . |
| vertx.launcher | Main-Class | The main class used to start the application, defaults to <code>io.vertx.core.Launcher</code> |

The package is generated using: `mvn clean package`

For more information on packaging refer to [vertx:package](#)

1.3. Running

The plugin allows running vert.x applications in following ways:

1.3.1. In foreground using [vertx:run](#)

The Vert.x application could also be run without building the fat jars, typically during the development mode. The [vertx:run](#) goal helps in running the application. The application will be run in as forked process with additional configurations based on the goals.

To run the application vert.x application in foreground, execute the following maven command

```
mvn clean compile vertx:run
```

You can enable the *edeploy* mode rebuilding and restarting the application upon file changes.

For more information on configuration options refer to [vertx:run](#)

1.3.2. In background using [vertx:start](#)

This allows the application be run using the uber or fat jar as background process. This option also attaches a configurable id or an autogenerated id which could be used to stop the process using [vertx:stop](#)

To start the application vert.x application in background, execute the following maven command

```
mvn clean install vertx:start
```

For more information on configuration options refer to [vertx:start](#)

To stop the application vert.x application running in background, execute the following maven command

```
mvn vertx:stop
```

For more information on configuration options refer to [vertx:stop](#)

Chapter 2. Common Configurations

All goals share the following configuration:

Table 2. Package configuration

| Element | Description | Default | Property |
|----------|---------------------------|------------------------|----------------|
| verticle | Main verticle to start up | | vertx.verticle |
| launcher | Main class to use | io.vertx.core.Launcher | vertx.launcher |

Chapter 3. Common Run Configurations

These are the common configuration shared by the run based goals such as **run**, **start** and **stop**.

Table 3. Run configuration

| Element | Description | Property | Default |
|---------------|---|-----------------|--|
| config | the application configuration file path that will be passed to the vertx launcher as -conf . If a yaml file is configured then it will be converted to json by the plugin. The converted file will be saved in <code>\${project.outputDir}/conf</code> directory | vertx.config | <code>\${basedir}/src/main/\${project.artifactId}.json</code> or <code>\${basedir}/src/main/\${project.artifactId}.yaml</code> or <code>\${basedir}/src/main/\${project.artifactId}.yml</code> |
| redeploy | controls whether vertx redeploy is enabled | | false |
| workDirectory | The working directory of the running process of the application | vertx.directory | <code>\${project.basedir}</code> |



Right now the plugin supports only file based Vert.x configuration

Chapter 4. Maven Goals

This plugin supports the following goals which are explained in detail in the next sections.

Table 4. Plugin Goals

| Goal | Description |
|----------------------------------|---|
| vertx:setup | Add the vertx-maven-plugin to your <code>pom.xml</code> file |
| vertx:initialize | Copy <i>js</i> dependencies to <i>webroot</i> , unpack webjars to <i>webroot</i> and initialize the redeployment mode |
| vertx:package | Package Vert.x applications |
| vertx:run | Run a Vert.x application in foreground |
| vertx:start | Run a Vert.x application in daemon mode with specific id |
| vertx:stop | Stops the vert.x application running in daemon mode |

4.1. vertx:setup

This goal adds the Vert.x Maven Plugin to your `pom.xml` file. The plugin is configured with a default configuration.

4.1.1. Example

```
mvn io.fabric8:vertx-maven-plugin:0.1-SNAPSHOT:setup
```

4.2. vertx:initialize

This goal has several aims:

- copy *js* dependencies to the *webroot* directory
- unpack *webjars* dependencies to the *webroot* directory
- initialize the *recording* of the build used for the redeployment

4.2.1. Configuration

The initialize goal has the following parameters apart from the ones mentioned in [Common Configuration](#)

Table 5. Package Configuration

| Element | Description | Property | Default |
|---------|--|----------|---|
| webRoot | The location where <i>js</i> dependencies and <i>webjars</i> are copied. | | <code>\${project.baseDir}/target/classes/webroot</code> |

| Element | Description | Property | Default |
|----------------------------------|---|----------|---------|
| stripWebJarVersion | Whether or not the version is stripped when unpacking webjars | | true |
| stripJavaScriptDependencyVersion | Whether or not the version is stripped when copying the JavaScript file | | true |

The `webroot` directory is generally used by the `StaticHandler` from Vert.x Web.

4.2.2. Redeployment

The `initialize` goal is used to configure the redeployment used in `vertx:run`. It starts observing the executed plugins in your build to *replay* them when a file changes.

4.3. vertx:package

This goal packages a Vert.x application as fat or über jar with its dependencies bundled as part of the jar.

4.3.1. Configuration

The `package` goal has the following parameters apart from the ones mentioned in [Common Configuration](#)

Table 6. Package Configuration

| Element | Description | Property | Default |
|---------------------------|--|----------|---------|
| serviceProvideCombination | Whether or not SPI files (<code>META-INF/services</code>) need to be combined. Accepted values as <code>combine</code> and <code>none</code> . | | combine |
| classifier | The classifier to use for the <i>fat</i> jar. By default, it uses the main artifact name. | | |

4.4. vertx:run

This goal allows to run the Vert.x application as part of the maven build. The application is always run as a forked process.

The goal does not have any exclusive configuration, [Common Run Configuration](#) defines all the applicable configurations for the goal

| Element | Description | Property | Default |
|----------|--|----------|---|
| redeploy | Whether or not the redeployment is enabled | | false |
| config | The configuration file to use to configure the application. This property is passed as the -config option to vertx run. | | src/main/config/application.json or src/main/config/application.yml |

When the redeployment is enabled, it replays the plugin configured between the *generate-source* and *process-classes* phases.

4.5. vertx:start

This goal allows to start the Vert.x application as a background process from maven build. This goal triggers the vert.x **start** command, passing the configuration values as mentioned below.

Table 7. Run configuration

| Element | Description | Property | Default |
|-----------|---|--------------------|---|
| startMode | The property to decide how the vert.x application will be started in background. The application can be started in jar mode in which the application will be packaged as fat jar and started, or can be run in exploded mode where the application will be launched with exploded <i>classesDirectory</i> and maven dependencies to the classpath | vertx.start.mode | jar |
| appId | The application id that will added as -id option to the vert.x start command | vertx.app.id | If this is not passed a default uuid will be generated and set as appId |
| jvmArgs | The Java Options that will be used when starting the application, these are the values that are typically passed to vert.x applications using <code>--java-opts</code> | vertx.jvmArguments | |

Apart from the above list of exclusive start configuration, the goal shares the common **Common Run Configuration** with the following configuration ignored by the goal,

- redeploy
- fork - by default every start is a forked process

4.6. vertx:stop

This goal allows to stop the vert.x application running as background process from maven build.

This goal triggers the `vert.x stop` command, passing the configuration values as mentioned below.

Table 8. Run configuration

| Element | Description | Property | Default |
|---------|---|----------|--|
| appIds | The application id's that will stopped using the <code>vert.x stop</code> command | | If this is not passed, the <code>vertx-start-proc.id</code> file present <code>workingDirectory</code> will be read for the application id |

Apart from the above list of exclusive start configuration, the goal shares the common **Common Run Configuration** with the following configuration ignored by the goal,

- redeploy
- fork - by default every stop is a forked process

Chapter 5. Example Configurations

The following sections shows example plugin snippets for the goals provided by the plugin.



please update the plugin version as needed (latest is **0.1-SNAPSHOT**).

5.1. vert.x:package Examples

This is the default configuration. It builds the fat jar in the *package* phase, and support *.js* and webjars dependencies. `mvn compile vertx:run` enables the redeployment.

```
<plugin>
  <groupId>io.fabric8</groupId>
  <artifactId>vertx-maven-plugin</artifactId>
  <version>${version}</version>
  <executions>
    <execution>
      <id>vmp</id>
      <goals>
        <goal>initialize</goal>
        <goal>package</goal>
      </goals>
    </execution>
  </executions>
  <configuration>
    <redeploy>true</redeploy>
  </configuration>
</plugin>
```

5.1.1. Webjars and javascript dependencies

When the *js* dependencies and the webjars are handled, it stripped the version by default. Let's illustrate this with the following dependencies:

```
<dependency>
  <groupId>io.vertx</groupId>
  <artifactId>vertx-web</artifactId>
  <version>3.3.3</version>
  <classifier>client</classifier>
  <type>js</type>
</dependency>
<dependency>
  <groupId>org.webjars</groupId>
  <artifactId>jquery</artifactId>
  <version>3.1.1</version>
</dependency>
```

The first dependency is a `js` dependency (`<type>js</type>`). The plugin resolves the dependency and copy the file to the `webroot` directory (the default is `${project.baseDir}/target/classes/webroot`). The output file name is: `vertx-web-client.js`.

The second dependency is a webjar. A `webjar` is a jar file containing web resources. The plugin extracts the web resource to the `webroot` directory. In this example, it creates: `${project.baseDir}/target/classes/webroot/jquery/jquery.js` (and other includes resources).

5.1.2. Using full names for webjars and javascript dependencies

By default the plugin stripped the version. However this behavior can be disabled using:

```
<plugin>
  <groupId>io.fabric8</groupId>
  <artifactId>vertx-maven-plugin</artifactId>
  <version>${version}</version>
  <executions>
    <execution>
      <id>vmp</id>
      <goals>
        <goal>initialize</goal>
        <goal>package</goal>
      </goals>
    </execution>
  </executions>
  <configuration>
    <redeploy>true</redeploy>
    <stripWebJarVersion>>false</stripWebJarVersion>
    <stripJavaScriptDependencyVersion>>false</stripJavaScriptDependencyVersion>
  </configuration>
</plugin>
```

In this case, the `vertx-web-client.js` output file is: `vertx-web-3.3.3-client.js`, while for jquery, resources are unpacked in `${project.baseDir}/target/classes/webroot/jquery/3.1.1`. You can always look into the `target/classes/webroot` directory to check the output files.

Finally, you can also configure the `webRoot` dir:

```

<plugin>
  <groupId>io.fabric8</groupId>
  <artifactId>vertx-maven-plugin</artifactId>
  <version>${version}</version>
  <executions>
    <execution>
      <id>vmp</id>
      <goals>
        <goal>initialize</goal>
        <goal>package</goal>
      </goals>
    </execution>
  </executions>
  <configuration>
    <webRoot>target/classes/assets</webRoot>
    <redeploy>true</redeploy>
  </configuration>
</plugin>

```

Notice that the `webRoot` directory is relative to the project directory.

5.2. vert.x:start Examples

You can start your application in background using: `mvn clean package vertx:start`. The application is started in background. An id is automatically associated with the process. This id can be specified:

```
mvn clean package vertx:start -Dvertx.app.id=my-vertx-app
```

This id is useful to stop the application:

```
mvn vertx:stop -Dvertx.app.id=my-vertx-app
```

The application id can be set in the `pom.xml` file:

```

---
<plugin>
  <groupId>io.fabric8</groupId>
  <artifactId>vertx-maven-plugin</artifactId>
  <version>${version}</version>
  <executions>
    <execution>
      <phase>initialize</phase>
      <phase>package</phase>
    </execution>
  </executions>
  <configuration>
    <appId>my-app-id</appId>
  </configuration>
</plugin>
---

```

5.2.1. start goal with custom java options

Because it's a forked process, passing Java options needs to be done explicitly using a specific property:

```

---
<plugin>
  <groupId>io.fabric8</groupId>
  <artifactId>vertx-maven-plugin</artifactId>
  <version>${version}</version>
  <executions>
    <execution>
      <phase>initialize</phase>
      <phase>package</phase>
    </execution>
  </executions>
  <configuration>
    <jvmArgs> ①
      <jvmArg>-Xms512m</jvmArg>
      <jvmArg>-Xmx1024m</jvmArg>
    </jvmArgs>
  </configuration>
</plugin>
---
<1> The jvm arguments that gets passed as '--java-opts' to the vert.x application

```

You can also pass these parameters in the command line:

```
mvn clean package vertx:start -Dvertx.jvmArguments=-Xms512m -D-Dfoo=far
```


5.2.2. stopping one or more applications

When you have configured to [\[start-with-app-id\]](#) or know the application ids, then you can add list of application ids as shown below to trigger stop of the those applications

```
---
<plugin>
  <groupId>io.fabric8</groupId>
  <artifactId>vertx-maven-plugin</artifactId>
  <version>${version}</version>
  <executions>
    <execution>
      <phase>package</phase>
      <goals>
        <goal>start</goal>
      </goals>
      <configuration>
        <appIds> ①
          <appId>my-app-id-1</appId>
          <appId>my-app-id-2</appId>
        </appIds>
      </configuration>
    </execution>
  </executions>
</plugin>
---
<1> List of custom unique application ids
```

Chapter 6. How does the redeploy work

During the *initialize* phase, the plugin start observing the mojos (Maven plugins) that are executed. When the Vert.x application is launched, it watches for changed in `src/main`. When a file is changed (created, updated or deleted), it replays the executed mojos. It executes all the mojos from the *generate-sources* to the *process-classes* phases, using the same configuration are the initial (observed) one.

When these mojos are executed, they may update files in `target/classes`. The Vert.x application has been launched to observe changed from this location and restart when change happens. The application is restarted completely, *i.e.* stopped and restarted.

Such mechanism let you use any Maven plugin (executed in the right set of phase). The plugin is re-executed and then the Vert.x application is restarted.

6.1. References

[Maven Properties](#)