

BUILDING OPTIMIZED DOCKER IMAGES FOR JVM PROJECTS

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HOW?

PLUGIN LIST

```
<plugin>
  <groupId>pl.project13.maven</groupId>
  <artifactId>git-commit-id-plugin</artifactId>
  <version>3.0.0</version>
</plugin>
<plugin>
  <groupId>org.codehaus.mojo</groupId>
  <artifactId>build-helper-maven-plugin</artifactId>
  <version>3.0.0</version>
</plugin>
<plugin>
  <groupId>org.apache.maven.plugins</groupId>
  <artifactId>maven-jar-plugin</artifactId>
  <version>3.1.2</version>
</plugin>
<plugin>
  <groupId>io.fabric8</groupId>
  <artifactId>docker-maven-plugin</artifactId>
  <version>0.30.0</version>
</plugin>
```

PLUGIN: GIT

```
<plugin>
  <groupId>pl.project13.maven</groupId>
  <artifactId>git-commit-id-plugin</artifactId>
  <configuration>
    <dateFormat>${maven.build.timestamp.format}</dateFormat>
  </configuration>
  <executions>
    <execution>
      <id>get-git-info</id>
      <goals>
        <goal>revision</goal>
      </goals>
    </execution>
  </executions>
</plugin>
```

PLUGIN: DEPENDENCIES

```
<plugin>
  <groupId>org.apache.maven.plugins</groupId>
  <artifactId>maven-dependency-plugin</artifactId>
  <configuration>
    <silent>>true</silent>
    <includeScope>runtime</includeScope>
    <pathSeparator>${classpath.separator}</pathSeparator>
  </configuration>
  <executions>
    <execution>
      <id>copy-external-dependencies</id>
      <phase>prepare-package</phase>
      <goals>
        <goal>copy-dependencies</goal>
        <goal>build-classpath</goal>
      </goals>
      <configuration>
        <excludeGroupIds>${project.parent.groupId}</excludeGroupIds>
        <outputDirectory>${project.build.directory}/${ext.dep.dir.path}</outputDirectory>
        <prefix>./${ext.dep.dir.path}</prefix>
        <outputProperty>classpath.external</outputProperty>
      </configuration>
    </execution>
    <execution>
      <id>copy-internal-dependencies</id>
      <phase>prepare-package</phase>
      <goals>
        <goal>copy-dependencies</goal>
        <goal>build-classpath</goal>
      </goals>
      <configuration>
        <includeGroupIds>${project.parent.groupId}</includeGroupIds>
        <outputDirectory>${project.build.directory}/${int.dep.dir.path}</outputDirectory>
        <prefix>./${int.dep.dir.path}</prefix>
        <outputProperty>classpath.internal</outputProperty>
      </configuration>
    </execution>
  </executions>
</plugin>
```

PLUGIN: BUILD HELPER

```
<plugin> <!-- workaround for MDEP-541 -->
  <groupId>org.codehaus.mojo</groupId>
  <artifactId>build-helper-maven-plugin</artifactId>
  <executions>
    <execution>
      <id>fix-classpath-separator</id>
      <phase>prepare-package</phase>
      <goals>
        <goal>regex-properties</goal>
      </goals>
      <configuration>
        <regexPropertySettings>
          <regexPropertySetting>
            <name>classpath.external</name>
            <value>${classpath.external}</value>
            <regex>${classpath.separator}</regex>
            <replacement xml:space="preserve"> </replacement>
          </regexPropertySetting>
          <regexPropertySetting>
            <name>classpath.internal</name>
            <value>${classpath.internal}</value>
            <regex>${classpath.separator}</regex>
            <replacement xml:space="preserve"> </replacement>
          </regexPropertySetting>
        </regexPropertySettings>
      </configuration>
    </execution>
  </executions>
</plugin>
```

PLUGIN: JAR

```
<plugin>
  <groupId>org.apache.maven.plugins</groupId>
  <artifactId>maven-jar-plugin</artifactId>
  <configuration>
    <archive>
      <manifest>
        <mainClass>${prh.main.class}</mainClass>
        <addDefaultImplementationEntries>true</addDefaultImplementationEntries>
        <addBuildEnvironmentEntries>true</addBuildEnvironmentEntries>
        <useUniqueVersions>false</useUniqueVersions> <!-- workaround for MJAR-156 -->
      </manifest>
      <manifestEntries>
        <Class-Path>${classpath.external} ${classpath.internal}</Class-Path>
        <Git-Branch>${git.branch}</Git-Branch>
        <Git-Build-Host>${git.build.host}</Git-Build-Host>
        <Git-Build-Time>${git.build.time}</Git-Build-Time>
        <Git-Build-User-Email>${git.build.user.email}</Git-Build-User-Email>
        <Git-Build-User-Name>${git.build.user.name}</Git-Build-User-Name>
        <Git-Build-Version>${git.build.version}</Git-Build-Version>
        <Git-Closest-Tag-Name>${git.closest.tag.name}</Git-Closest-Tag-Name>
        <Git-Commit-Id>${git.commit.id}</Git-Commit-Id>
        <Git-Commit-Message-Short>${git.commit.message.short}</Git-Commit-Message-Short>
        <Git-Commit-Time>${git.commit.time}</Git-Commit-Time>
        <Git-Commit-User-Email>${git.commit.user.email}</Git-Commit-User-Email>
        <Git-Commit-User-Name>${git.commit.user.name}</Git-Commit-User-Name>
      </manifestEntries>
    </archive>
  </configuration>
</plugin>
```


PLUGIN: DOCKER

```
<plugin>
  <groupId>io.fabric8</groupId>
  <artifactId>docker-maven-plugin</artifactId>
  <configuration>
    <skip>${skipDocker}</skip>
    <images>
      <image>
        <name>${project.groupId}.${project.artifactId}</name>
        <registry>${onap.nexus.dockerregistry.daily}</registry>
        <build>
          <contextDir>${project.basedir}</contextDir>
          <cleanup>none</cleanup>
          <tags>
            <tag>latest</tag>
            <tag>${project.version}</tag>
            <tag>${project.version}-${maven.build.timestamp}Z</tag>
          </tags>
        </build>
      </image>
    </images>
  </configuration>
  <executions>
    <execution>
      <id>docker-build-image</id>
      <phase>package</phase>
      <goals>
        <goal>build</goal>
      </goals>
    </execution>
    <execution>
      <id>docker-push-image</id>
      <phase>deploy</phase>
      <goals>
        <goal>push</goal>
      </goals>
    </execution>
  </executions>
</plugin>
```

```
    </executions>  
  </plugin>  
</plugins>  
</build>
```

DOCKERFILE

```
FROM openjdk:8-jre-alpine

LABEL copyright="Copyright (C) 2018-2019 NOKIA" \
  license.name="The Apache Software License, Version 2.0" \
  license.url="http://www.apache.org/licenses/LICENSE-2.0" \
  maintainer="Nokia Wroclaw ONAP Team"

RUN adduser -h ${docker.user.dir} -D ${docker.user.name}; \
  chmod -R a+w /var/log

USER ${docker.user.name}
WORKDIR ${docker.user.dir}

EXPOSE 8100 8433
ENTRYPOINT ["java", "-jar", "${project.artifactId}-${project.version}.jar"]

COPY ${project.build.directory}/${ext.dep.dir.path}/ ${ext.dep.dir.path}/
COPY ${project.build.directory}/${int.dep.dir.path}/ ${int.dep.dir.path}/
COPY ${project.build.directory}/${project.artifactId}-${project.version}.jar .

LABEL git.branch="${git.branch}" \
  git.build.host="${git.build.host}" \
  git.build.time="${git.build.time}" \
  git.build.user.email="${git.build.user.email}" \
  git.build.user.name="${git.build.user.name}" \
  git.build.version="${git.build.version}" \
  git.closest.tag.name="${git.closest.tag.name}" \
  git.commit.id="${git.commit.id}" \
  git.commit.message.short="${git.commit.message.short}" \
  git.commit.time="${git.commit.time}" \
  git.commit.user.email="${git.commit.user.email}" \
  git.commit.user.name="${git.commit.user.name}"
```

WHY?

SIZE & SPEED

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
org.onap.dcaegen2.services.prh.prh-app-server	1.3.1-SNAPSHOT	d382820fd687	38 minutes ago	131MB
org.onap.dcaegen2.services.prh.prh-app-server	1.3.1-SNAPSHOT-20190718T115939Z	d382820fd687	38 minutes ago	131MB
org.onap.dcaegen2.services.prh.prh-app-server	latest	d382820fd687	38 minutes ago	131MB
org.onap.dcaegen2.services.prh.prh-app-server	1.3.1-SNAPSHOT-20190718T115437Z	9b18b7e52767	43 minutes ago	131MB

docker history 9b18b7e52767

IMAGE	COMMENT	CREATED	CREATED BY	SIZE
9b18b7e52767		9 minutes ago	/bin/sh -c #(nop) LABEL git.branch=master g...	0B
e75cd5d944d5		9 minutes ago	/bin/sh -c #(nop) COPY file:aaa3e385b64e7e20...	74.8kB
ee4388ba58e3		9 minutes ago	/bin/sh -c #(nop) COPY dir:226fa841d65daf193...	497kB
54395486b832		9 minutes ago	/bin/sh -c #(nop) COPY dir:d588e87ed1b31afad...	45.9MB
b405c63ec944		9 minutes ago	/bin/sh -c #(nop) ENTRYPOINT ["java" "-jar"...	0B
a7deb65dd652		9 minutes ago	/bin/sh -c #(nop) EXPOSE 8100 8433	0B
a37f933694b7		9 minutes ago	/bin/sh -c #(nop) WORKDIR /home/prh	0B
411f3b4d9475		9 minutes ago	/bin/sh -c #(nop) USER prh	0B
9ae6dc2b7897		9 minutes ago	/bin/sh -c adduser -h /home/prh -D prh; ...	4.81kB
e399a6b61d88		9 minutes ago	/bin/sh -c #(nop) LABEL copyright=Copyright...	0B
f7a292bbb70c		2 months ago	/bin/sh -c set -x && apk add --no-cache o...	79.4MB
<missing>		2 months ago	/bin/sh -c #(nop) ENV JAVA_ALPINE_VERSION=8...	0B
<missing>		2 months ago	/bin/sh -c #(nop) ENV JAVA_VERSION=8u212	0B
<missing>		2 months ago	/bin/sh -c #(nop) ENV PATH=/usr/local/sbin:...	0B
<missing>		2 months ago	/bin/sh -c #(nop) ENV JAVA_HOME=/usr/lib/jv...	0B
<missing>		2 months ago	/bin/sh -c { echo '!/bin/sh'; echo 'set...	87B
<missing>		2 months ago	/bin/sh -c #(nop) ENV LANG=C.UTF-8	0B
<missing>		2 months ago	/bin/sh -c #(nop) CMD ["/bin/sh"]	0B
<missing>		2 months ago	/bin/sh -c #(nop) ADD file:a86aeaf3a7d68f6a...	5.53MB

docker history d382820fd687

IMAGE	COMMENT	CREATED	CREATED BY	SIZE
d382820fd687		4 minutes ago	/bin/sh -c #(nop) LABEL git.branch=master g...	0B
50ebd4e1e100		4 minutes ago	/bin/sh -c #(nop) COPY file:310f980f17b8559e...	74.8kB
7d6d05e2b8b0		5 minutes ago	/bin/sh -c #(nop) COPY dir:8907703b8e60beb51...	497kB
54395486b832		9 minutes ago	/bin/sh -c #(nop) COPY dir:d588e87ed1b31afad...	45.9MB
b405c63ec944		9 minutes ago	/bin/sh -c #(nop) ENTRYPOINT ["java" "-jar"...	0B
a7deb65dd652		9 minutes ago	/bin/sh -c #(nop) EXPOSE 8100 8433	0B
a37f933694b7		9 minutes ago	/bin/sh -c #(nop) WORKDIR /home/prh	0B
411f3b4d9475		9 minutes ago	/bin/sh -c #(nop) USER prh	0B
9ae6dc2b7897		9 minutes ago	/bin/sh -c adduser -h /home/prh -D prh; ...	4.81kB
e399a6b61d88		9 minutes ago	/bin/sh -c #(nop) LABEL copyright=Copyright...	0B
f7a292bbb70c		2 months ago	/bin/sh -c set -x && apk add --no-cache o...	79.4MB
<missing>		2 months ago	/bin/sh -c #(nop) ENV JAVA_ALPINE_VERSION=8...	0B
<missing>		2 months ago	/bin/sh -c #(nop) ENV JAVA_VERSION=8u212	0B
<missing>		2 months ago	/bin/sh -c #(nop) ENV PATH=/usr/local/sbin:...	0B
<missing>		2 months ago	/bin/sh -c #(nop) ENV JAVA_HOME=/usr/lib/jv...	0B
<missing>		2 months ago	/bin/sh -c { echo '!/bin/sh'; echo 'set...	87B
<missing>		2 months ago	/bin/sh -c #(nop) ENV LANG=C.UTF-8	0B
<missing>		2 months ago	/bin/sh -c #(nop) CMD ["/bin/sh"]	0B
<missing>		2 months ago	/bin/sh -c #(nop) ADD file:a86aeaf3a7d68f6a...	5.53MB

~500 KB difference between builds

VERSIONING: DOCKER

```
docker inspect -f "{{json .Config.Labels}}" org.onap.dcaegen2.services.prh.prh-app-server | jq
{
  "copyright": "Copyright (C) 2018-2019 NOKIA",
  "git.branch": "master",
  "git.build.host": "pinky",
  "git.build.time": "20190718T135950",
  "git.build.user.email": "piotr.bochenski@nokia.com",
  "git.build.user.name": "Piotr Bocheński",
  "git.build.version": "1.3.1-SNAPSHOT",
  "git.closest.tag.name": "2.0.0-ONAP",
  "git.commit.id": "b32fb6d7da818acb14a0f4f5f8d3d2a7f7d07da8",
  "git.commit.message.short": "Align PRH container to new guidelines",
  "git.commit.time": "20190716T122202",
  "git.commit.user.email": "piotr.wielebski@nokia.com",
  "git.commit.user.name": "pwielebs",
  "license.name": "The Apache Software License, Version 2.0",
  "license.url": "http://www.apache.org/licenses/LICENSE-2.0",
  "maintainer": "Nokia Wroclaw ONAP Team"
}
```

VERSIONING: JAR

```
➤ /data/workspace/onap-public/prh/prh-app-server ➤ git master 1 ➤ unzip -q -c target/prh-app-server-1.3.1-SNAPSHOT.jar META-INF/MANIFEST.MF | grep Git
Git-Branch: master
Git-Build-Host: pinky
Git-Build-Time: 20190718T135950
Git-Build-User-Email: piotr.bochenski@nokia.com
Git-Build-User-Name: Piotr Bocheński
Git-Build-Version: 1.3.1-SNAPSHOT
Git-Closest-Tag-Name: 2.0.0-ONAP
Git-Commit-Id: b32fb6d7da818acb14a0f4f5f8d3d2a7f7d07da8
Git-Commit-Message-Short: Align PRH container to new guidelines
Git-Commit-Time: 20190716T122202
Git-Commit-User-Email: piotr.wielebski@nokia.com
Git-Commit-User-Name: pwielebs
```

THANKS!