Maven Best Practices

Version 1.18-SNAPSHOT

2019-01-11

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Table 1. History

Date	Author	Detail
2019-01-10	bcouetil	reveal my asciidoc + last slide animated bubbles + updated reveal theme + css c3js fix + maven wrapper
2018-08-29	bcouetil	Asciidoc HTML look & feel changes
2018-08-24	bcouetil	Icones added for download + favicon added for webpage
2018-08-23	bcouetil	Initial commit

1. Installation

1.1. Java

Install Java 8+ and configure JAVA_HOME.

1.2. Maven Wrapper

Use Maven Wrapper on your project to avoid Maven installation by team members.

Maven is still needed to create the wrapper

```
$ mvn -N io.takari:maven:wrapper
```

This will create standalone Maven launchers , `mvnw` for unix and `mvnw.cmd` for Windows.

2. Config files location

Config files have to be put in the right folder in Eclipse.

- **src/main/resources/**
  - Only files that will is not likely to be modified, because it will be in the jar
- **config/**
  - Files that is likely to be modified on IS
  - Don't forget to put them manually on IS
- **src/test/resources/**
  - File used in JUnit tests only for this sub-module
- **../src/test/shared-resources**
  - Files used in JUnit tests accross multiple modules
  - It requires some maven configuration :

pom.xml plugin for shared-resources

```
<plugin>
  <groupId>org.codehaus.mojo</groupId>
  <artifactId>build-helper-maven-plugin</artifactId>
  <version>3.0.0</version>
  <executions>
    <execution>
      <id>add-test-resources</id>
      <phase>generate-test-resources</phase>
      <goals>
        <goal>add-test-resource</goal>
      </goals>
      <configuration>
        <resources>
          <resource>
            <directory>${project.parent.basedir}/src/test/shared-resources</directory>
          </resource>
        </resources>
      </configuration>
    </execution>
  </executions>
</plugin>
```

Never write programmatically files outside of **target/** directory, for the sake of source code management

3. Checkstyle : check javadoc

With Checkstyle, you can enforce continuous javadoc check

pom.xml plugin

```
<!-- checkstyle to fail the build on javadoc warnings -->
<!-- to skip : mvn install -Dcheckstyle.skip=true -->
<plugin>
  <groupId>org.apache.maven.plugins</groupId>
  <artifactId>maven-checkstyle-plugin</artifactId>
  <version>2.17</version>
  <executions>
    <execution>
      <id>validate</id>
      <phase>validate</phase>
      <configuration>
        <configLocation>checkstyle-javadoc.xml</configLocation>
        <encoding>UTF-8</encoding>
        <consoleOutput>true</consoleOutput>
        <failsOnError>true</failsOnError>
        <linkXRef>false</linkXRef>
      </configuration>
      <goals>
        <goal>check</goal>
      </goals>
    </execution>
  </executions>
</plugin>
```

checkstyle-javadoc.xml to be created in the root project

```
<?xml version="1.0"?>
<!DOCTYPE module PUBLIC
  "-//Puppy Crawl//DTD Check Configuration 1.2//EN"
  "http://www.puppycrawl.com/dtds/configuration_1_2.dtd">
<module name="Checker">
  <module name="TreeWalker">
      <module name="JavadocMethod"/>
      <module name="JavadocType"/>
      <module name="JavadocVariable"/>
      <module name="JavadocStyle"/>
  </module>
</module>
```

4. Maven watcher

You can launch Maven once with a plugin that watches a given folder for auto-refresh. This can be used for front end artifact generation or documentation-as-code as shown below :

Watcher plugin configuration for Asciidoctor

```
<!-- modifications watcher https://github.com/fizzed/maven-plugins -->
<!-- usage : mvn fizzed-watcher:run -->
<plugin>
    <groupId>com.fizzed</groupId>
    <artifactId>fizzed-watcher-maven-plugin</artifactId>
    <version>1.0.6</version>
    <configuration>
        <touchFile>target/watcher.touchfile</touchFile>
        <watches>
            <watch>
                <directory>src/docs/asciidoc</directory>
            </watch>
        </watches>
        <goals>
            <goal>clean</goal>
            <goal>generate-resources</goal>
        </goals>
    </configuration>
        </plugin>
```

Then just run with following command :

```
$ mvn fizzed-watcher:run
```

5. Add version and date to Asciidoc PDFs

pom.xml

```
<plugins>

  <plugin>
    <groupId>org.codehaus.mojo</groupId>
    <artifactId>buildnumber-maven-plugin</artifactId>
    <version>1.2</version>
    <executions>
      <execution>
        <phase>validate</phase>
        <goals>
          <goal>create-timestamp</goal>
        </goals>
      </execution>
    </executions>
    <configuration>
      <timestampFormat>yyyy-MM-dd</timestampFormat>
      <timestampPropertyName>build.date</timestampPropertyName>
    </configuration>
  </plugin>

  <!-- Ant tasks plugin -->
  <!-- single usage : mvn antrun:run -->
  <plugin>
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-antrun-plugin</artifactId>
    <version>1.7</version>
    <inherited>true</inherited>
    <executions>
      <execution>
        <!-- add version to generated pdf filenames -->
        <id>pdfsAddVersion</id>
        <configuration>
          <failOnError>false</failOnError>
          <target name="add version and date to all generated pdf filenames">
            <move todir="${project.build.directory}/generated-docs" includeemptydirs="false">
              <fileset dir="${project.build.directory}/generated-docs" />
              <mapper type="glob" from="*.pdf" to="*_V${project.version}_${build.date}.pdf" />
            </move>
          </target>
        </configuration>
        <goals>
          <goal>run</goal>
        </goals>
      </execution>
    </executions>
  </plugin>

</plugins>
```

6. Javadoc generation with UML diagrams

pom.xml

```
<!-- javadoc html, fix or generate -->
<plugin>
  <groupId>org.apache.maven.plugins</groupId>
  <artifactId>maven-javadoc-plugin</artifactId>
  <version>2.10.4</version>
  <configuration>
    <!-- usage : javadoc:javadoc or javadoc:jar -->
    <show>public</show>
    <reportOutputDirectory>${project.reporting.outputDirectory}</reportOutputDirectory>
    <destDir>javadoc</destDir>
    <!-- for UML diagram in javadoc:javadoc -->
    <!-- Locally : need http://www.graphviz.org/Download_windows.php to work -->
    <!-- and add "C:\Program Files (x86)\Graphviz\bin" to windows path -->
    <doclet>org.umlgraph.doclet.UmlGraphDoc</doclet>
    <docletArtifact>
      <groupId>org.umlgraph</groupId>
      <artifactId>umlgraph</artifactId>
      <version>5.6.6</version>
    </docletArtifact>
    <additionalparam>-views -attributes -visibility -types -enumerations -enumconstants</additionalparam>
    <useStandardDocletOptions>true</useStandardDocletOptions>
  </configuration>
</plugin>
```

7. Install provided dependencies in local repository

pom.xml

```
<plugins>
  <!-- install WM jars in local repository -->
  <!-- part of mvn clean because maven check them early in the process -->
  <plugin>
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-install-plugin</artifactId>
    <version>2.5.2</version>
    <!-- We do not want children attempting to install these jars to the repository -->
    <inherited>false</inherited>
    <executions>
      <execution>
        <id>wm-isclient95</id>
        <phase>clean</phase>
        <goals>
          <goal>install-file</goal>
        </goals>
        <configuration>
          <file>lib/wm9.5/wm-isclient-9.5.jar</file>
          <groupId>webmethods</groupId>
          <artifactId>wm-isclient</artifactId>
          <version>9.5</version>
          <packaging>jar</packaging>
        </configuration>
      </execution>
  </plugin>
</plugins>
```

8. To generate AsciiDoc PDF files

See Asciidoc Best Practices

9. SonarQube with Jacoco for coverage

https://www.sonarqube.org

SonarQube ensures code quality with static analysis and Jacoco checks code coverage.

pom.xml properties

```
<properties>
  <custom.ut.skip>${skipTests}</custom.ut.skip>
  <sonar.java.coveragePlugin>jacoco</sonar.java.coveragePlugin>
  <jacoco.reportPath>../target/jacoco.exec</jacoco.reportPath>
  <jacoco.itReportPath>../target/jacoco-it.exec</jacoco.itReportPath>
  <sonar.jacoco.reportPaths>${jacoco.reportPath}, ${jacoco.itReportPath}</sonar.jacoco.reportPaths>

<sonar.coverage.exclusions>**/WmCall.*,**/Broker*.*,**/UniversalMessaging*.*,**/MsgServerBroker.*,**/UmListener.*,**/Per
fLogger.*,**/elastic/*DataSender.*</sonar.coverage.exclusions>
  <sonar.host.url>http://localhost:9000</sonar.host.url>
  <sonar.scm.disabled>true</sonar.scm.disabled>
  <sonar.scm.provider>git</sonar.scm.provider>
</properties>
```

pom.xml without powermock static

```
<dependencies>

  <!-- For unit tests coverage in Sonar -->
  <dependency>
    <groupId>org.sonarsource.java</groupId>
    <artifactId>sonar-jacoco-listeners</artifactId>
    <version>4.9.0.9858</version>
    <scope>test</scope>
  </dependency>

</dependencies>

<plugins>

  <!-- SonarQube -->
  <plugin>
    <groupId>org.codehaus.mojo</groupId>
    <artifactId>sonar-maven-plugin</artifactId>
    <version>3.2</version>
  </plugin>

  <!-- handling unit tests coverage with Jacco -->
  <plugin>
    <groupId>org.jacoco</groupId>
    <artifactId>jacoco-maven-plugin</artifactId>
    <version>0.8.0</version>
    <executions>
      <execution>
        <id>pre-unit-test</id>
        <phase>test-compile</phase>
        <goals>
          <goal>prepare-agent</goal>
        </goals>
        <configuration>
          <destFile>${sonar.jacoco.reportPath}</destFile>
          <dataFile>${sonar.jacoco.reportPath}</dataFile>
          <append>true</append>
        </configuration>
      </execution>
      <execution>
        <id>prepare-jacoco-agent-it</id>
        <phase>pre-integration-test</phase>
```

```
        <goals>
          <goal>prepare-agent-integration</goal>
        </goals>
        <configuration>
          <destFile>${sonar.jacoco.itReportPath}</destFile>
          <dataFile>${sonar.jacoco.itReportPath}</dataFile>
          <append>true</append>
        </configuration>
      </execution>
    </executions>
  </plugin>

  <!-- Unit Tests -->
  <plugin>
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-surefire-plugin</artifactId>
    <!-- version 2.19.1 is broken on jenkins -->
    <version>2.18.1</version>
    <configuration>
      <testFailureIgnore>false</testFailureIgnore>
      <runOrder>alphabetical</runOrder>
      <skipTests>${custom.ut.skip}</skipTests>
      <properties>
        <property>
          <name>listener</name>
          <value>org.sonar.java.jacoco.JUnitListener</value>
        </property>
      </properties>
    </configuration>
  </plugin>

  <!-- Integration Tests -->
  <plugin>
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-failsafe-plugin</artifactId>
    <!-- version 2.19.1 is broken on jenkins -->
    <version>2.18.1</version>
    <configuration>
      <runOrder>alphabetical</runOrder>
      <properties>
        <property>
          <name>listener</name>
          <value>org.sonar.java.jacoco.JUnitListener</value>
        </property>
      </properties>
    </configuration>
    <executions>
      <execution>
        <id>integration-tests</id>
        <phase>integration-test</phase>
        <goals>
          <goal>integration-test</goal>
        </goals>
      </execution>
      <!-- to exit in error on test fail -->
      <execution>
        <id>verify</id>
        <phase>verify</phase>
        <goals>
          <goal>verify</goal>
        </goals>
      </execution>
    </executions>
  </plugin>

</plugins>
```

pom.xml with powermock : instrumentation in conflict, offline jacoco instrumentation is needed

```
```

```
<dependencies>

  <!-- For unit tests coverage in Sonar -->
  <dependency>
    <groupId>org.jacoco</groupId>
    <artifactId>org.jacoco.agent</artifactId>
    <classifier>runtime</classifier>
    <version>0.8.0</version>
    <scope>test</scope>
  </dependency>

</dependencies>

<plugins>

  <!-- SonarQube -->
  <plugin>
    <groupId>org.codehaus.mojo</groupId>
    <artifactId>sonar-maven-plugin</artifactId>
    <version>3.2</version>
  </plugin>

  <!-- handling unit tests coverage with Jacco -->
  <!-- offline instrumentation is mandatory when using other instrumentation framework such as PowerMock -->
  <!-- https://github.com/powermock/powermock/wiki/Code-coverage-with-JaCoCo -->
  <!-- to separate UT and IT : -->
  <!-- (1) mvn test jacoco:restore-instrumented-classes -->
  <!-- (2) mvn install -Dcustom.ut.skip=true -Dcheckstyle.skip=true -->
  <plugin>
    <groupId>org.jacoco</groupId>
    <artifactId>jacoco-maven-plugin</artifactId>
    <version>0.8.0</version>
    <executions>
      <execution>
        <id>jacoco-instrument</id>
        <phase>test-compile</phase>
        <goals>
          <goal>instrument</goal>
        </goals>
        <configuration>
          <skip>${skipTests}</skip>
        </configuration>
      </execution>
      <execution>
        <id>jacoco-restore-instrumented-classes</id>
        <phase>post-integration-test</phase>
        <goals>
          <goal>restore-instrumented-classes</goal>
        </goals>
        <configuration>
          <skip>${skipTests}</skip>
        </configuration>
      </execution>
    </executions>
  </plugin>

    <!-- Unit Tests -->
  <plugin>
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-surefire-plugin</artifactId>
    <!-- version 2.19.1 is broken on jenkins -->
    <version>2.18.1</version>
    <configuration>
      <testFailureIgnore>false</testFailureIgnore>
      <runOrder>alphabetical</runOrder>
      <skipTests>${custom.ut.skip}</skipTests>
      <systemPropertyVariables>
        <jacoco-agent.destfile>${jacoco.reportPath}</jacoco-agent.destfile>
      </systemPropertyVariables>
    </configuration>
```

```
  </plugin>

  <!-- Integration Tests -->
  <!-- usage full test : mvn integration-test -->
  <!-- usage only IT (but does not fill jacoco-it) : mvn test-compile failsafe:integration-test -->
  <plugin>
    <groupId>org.apache.maven.plugins</groupId>
    <artifactId>maven-failsafe-plugin</artifactId>
    <!-- version 2.19.1 is broken on jenkins -->
    <version>2.18.1</version>
    <configuration>
      <runOrder>alphabetical</runOrder>
      <systemPropertyVariables>
        <jacoco-agent.destfile>${jacoco.itReportPath}</jacoco-agent.destfile>
      </systemPropertyVariables>
    </configuration>
    <executions>
      <execution>
        <id>integration-tests</id>
        <phase>integration-test</phase>
        <goals>
          <goal>integration-test</goal>
        </goals>
      </execution>
      <execution>
        <id>verify</id>
        <phase>verify</phase>
        <goals>
          <goal>verify</goal>
        </goals>
      </execution>
    </executions>
  </plugin>

</plugins>
```

10. Appendix

10.1. Revision marks

Differences since last tag