Maven

QUALITY THOUGHT

INFOSYSTEMS (INDIA) PVT. LTD.

What is Maven

- **At its simplest, Maven is a build tool**
  - It always produces one artifact (component)
  - It helps us manage dependencies
- **It can also be used as a project management tool**
  - It handles versioning and releases
  - Describes what your project is doing or what it produces
  - Can easily produce Javadocs as well as other site information

Who owns it

- Maven is managed by the Apache Software Foundation
- Maven sites are built with Maven
- Open Source

Why do you want to use it

- Repeatable builds
  - We can recreate our build for any environment
- Transitive dependencies
  - Downloading a dependency with also pull other items it needs
- Contains everything it needs for your environment
- Works with a local repo
- Works with your IDE, but also standalone
- The preferred choice for working with build tools like Jenkins or Cruise Control

How To Install Maven ?

1. https://maven.apache.org/install.html
2. Installing Maven using apt-get
   "https://www.mkyong.com/maven/how-to-install-maven-in-ubuntu/"
3. Installing maven on Centos / Redhat family
   https://tecadmin.net/install-apache-maven-on-centos/
4. To install Java follow

https://www.digitalocean.com/community/tutorials/how-to-install-java-on-ubuntu-with-apt-get

https://www.digitalocean.com/community/tutorials/how-to-

Hello World Maven Project

- Create a new folder (Directory) called hello-world
- Navigate with hello-world and create a file called pom.xml

```
lenovo@lenovo-PC MINGW64 /d/DevOps
$ cd MavenZone/

lenovo@lenovo-PC MINGW64 /d/DevOps/MavenZone (master)
$ mkdir hello-world

lenovo@lenovo-PC MINGW64 /d/DevOps/MavenZone (master)
$ cd hello-world

lenovo@lenovo-PC MINGW64 /d/DevOps/MavenZone/hello-world (master)
$ touch pom.xml
```

Hello World MAVEN PROJECT (CONTD..)

- Edit pom.xml with following contents

```xml
<project>

    <!--Purpose: generally unique amongst an organization or a project-->
    <groupId>org.qt.devops</groupId>

    <!--The artifactId is generally the name that the project is known by. -->
    <artifactId>hello-world</artifactId>

    <!--version of artifact/component -->
    <version>1.0-SNAPSHOT </version>

    <!--schema version of pom.xml -->
    <modelVersion>4.0.0</modelVersion>

    <!--defines packaging (jar/war)-->
    <packaging>jar</packaging>

</project>
```

Hello World MAVEN PROJECT (CONTD..)

- Create folder src/main/java

```
lenovo@lenovo-PC MINGW64 /d/DevOps/MavenZone/hello-world (master)
$ mkdir -p src/main/java
```

- Create a file HelloWorld.java with following contents

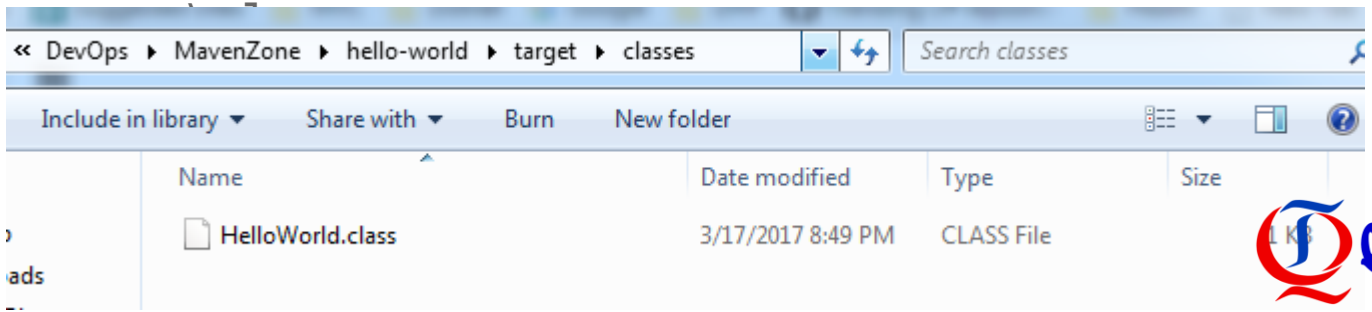
```
public class HelloWorld {

    public static void main(String[] args) {
        System.out.println("Welcome to world of Maven");
    }
}
```

- Navigate to the folder containing pom.xml file

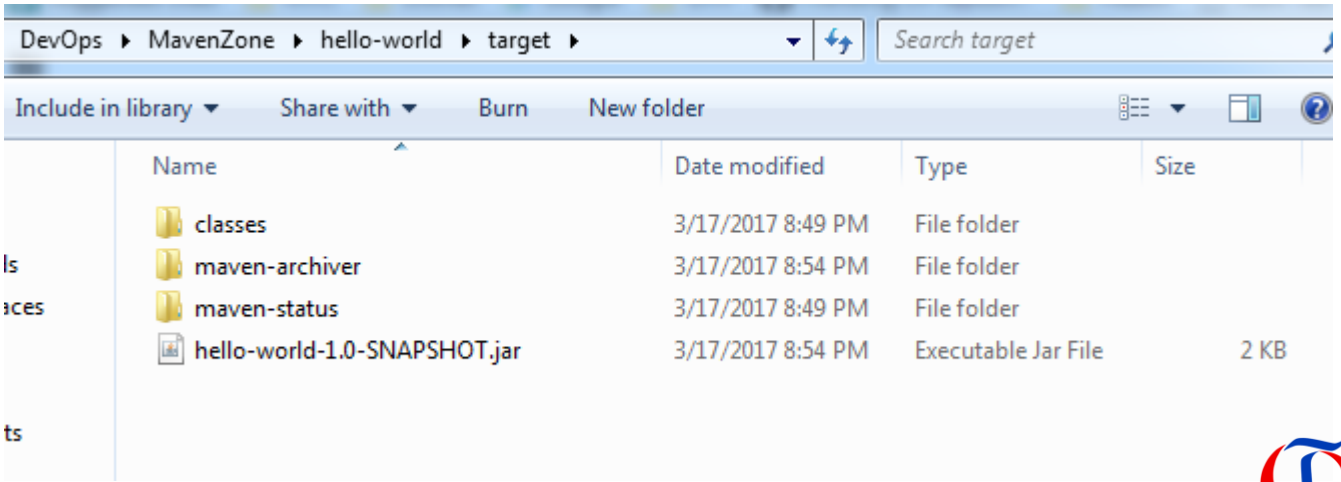
Hello World MAVEN PROJECT (CONTD..)

- Execute **mvn clean** in command line/Terminal. If you are running for first time maven downloads bunch of plugins & it take some time
- Execute **mvn compile** in terminal. This will compile the java code and show you compile errors if any. If the compile is success, it will copy the class files to



Hello World MAVEN PROJECT (CONTD..)

- Execute **mvn package** to perform packaging & create jar file in target folder . The jar files name will be **<artifactid>-<version>.<packaging type>**



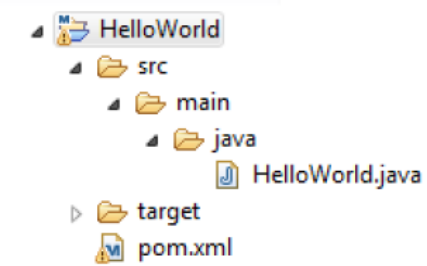
STRUCTURE OF MAVEN

Outline

- Folder Structure
- POM File Basics
- Basic Commands and Goals
- Dependencies
- Local Repo

src/main/what?

- src/main/java
- target
- pom.xml



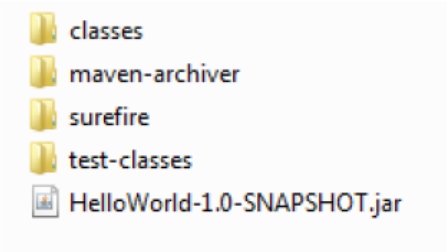
FOLDER STRUCTURE

src/main/java

- **Where we store our Java code**
  - The beginning of our package declaration
    - com.yourcompanyname.division
- **What about other languages**
  - src/main/groovy
- **What about testing**
  - src/test/java

target

- Where everything gets compiled to
- Also where tests get ran from
- Contents in this directory get packaged into a jar, war, ear, etc…



FOLDER STRUCTURE

pom.xml

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```

FOLDER STRUCTURE

pom.xml

- **Can be divided into 4 basic parts:**
  - Project Information
    - groupId
    - artifactId
    - version
    - packaging
  - Dependencies
    - Direct dependencies used in our application
  - Build
    - Plugins
    - Directory Structure
  - Repositories
    - Where we download the artifacts from

Dependencies

- What we want to use in our application
- Dependencies are imported by their naming convention
  - Often considered the most confusing part of Maven
- We have to know the groupId, artifactId, and the version of what we are looking for
- Added to a dependencies section to our pom file

Dependencies

- **Just list the dependency that we want**
  - Transitive dependencies will be pulled in by Maven
- **Need at a minimum 3 things:**
  - groupId
  - artifactId
  - version

```
<dependencies>
    <dependency>
        <groupId>commons-lang</groupId>
        <artifactId>commons-lang</artifactId>
        <version>2.1</version>
    </dependency>
</dependencies>
```

```xml
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    <dependencies>
        <!-- https://mvnrepository.com/artifact/log4j/log4j -->
        <dependency>
            <groupId>log4j</groupId>
            <artifactId>log4j</artifactId>
            <version>1.2.17</version>
        </dependency>

    </dependencies>

</project>
```

Goals

- **clean**
  - Deletes the target directory and any generated resources
- **compile**
  - Compiles all source code, generates any files, copies resources to our classes directory
- **package**
  - Runs the compile command first, runs any tests, packages the app based off of its packaging type
- **install**
  - Runs the package command and then installs it in your local repo
- **deploy**
  - Runs the install command and then deploys it to a corporate repo
  - Often confused with deploying to a web server

Local Repo

- **Where Maven stores everything it downloads**
  - Installs in your home directory\.m2
    - C:\Users\<yourusername>\.m2\repository
- **Stores artifacts using the information that you provided for artifactId, groupId, and version**
  - C:\Users\<yourusername>\.m2\repository\commons-lang\commons-lang\2.1\commons-lang-2.1.jar
- **Avoids duplication by copying it in every project and storing it in your SCM**