Maven | M2E | Tycho

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Ant vs Maven

- Ant
  - Procedural
  - How to do it
- Maven
  - Declarative
  - Get this done
  - Convention over configuration
  - Standard project structure
  - “Magic” hidden in plugins and goals

Simple Ant build file

```
<project name=“antproject" default="dist" basedir=".">
    <description>
        simple example build file
    </description>
  <!-- set global properties for this build -->
  <property name="src" location="src"/>
  <property name="build" location="build"/>
  <property name="dist"  location="dist"/>

  <target name="init">
    <!-- Create the time stamp -->
    <tstamp/>
    <!-- Create the build directory structure used by compile -->
    <mkdir dir="${build}"/>
  </target>

  <target name="compile" depends="init"
        description="compile the source " >
    <!-- Compile the java code from ${src} into ${build} -->
    <javac srcdir="${src}" destdir="${build}"/>
  </target>

  <target name="dist" depends="compile"
        description="generate the distribution" >
    <!-- Create the distribution directory -->
    <mkdir dir="${dist}/lib"/>

    <!-- Put everything in ${build} into the MyProject-${DSTAMP}.jar file -->
    <jar jarfile="${dist}/lib/MyProject-${DSTAMP}.jar" basedir="${build}"/>
  </target>

  <target name="clean"
        description="clean up" >
    <!-- Delete the ${build} and ${dist} directory trees -->
    <delete dir="${build}"/>
    <delete dir="${dist}"/>
  </target>
</project>
```

Simple POM

```
<project xmlns="http://maven.apache.org/POM/4.0.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
                      http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.example</groupId>
  <artifactId>mavenproject</artifactId>
  <version>1.0</version>
  <packaging>jar</packaging><!- convention over configuration -->
</project>
```

Concepts

- POM
- Artifact Repositories
    - Artifacts
    - Plugins
    - Archetypes
- Build
    - Reactor
    - Profiles
        - Activate and deactivate to vary buids

POM

- GAV
- POM Relationships
  - Dependencies
    - Scopes – will talk about it later
  - Parent/Child
    - Inheritance
      - Super POM
      - Properties and configurations are inherited
      - Notion of effective POM
  - Aggregator/Module

GAV

- Group Id
- Artifact Id
- Version
  - Snapshot (development mode)
  - Release
    - major.minor.seric-qualifier
- Packaging
- Classifier

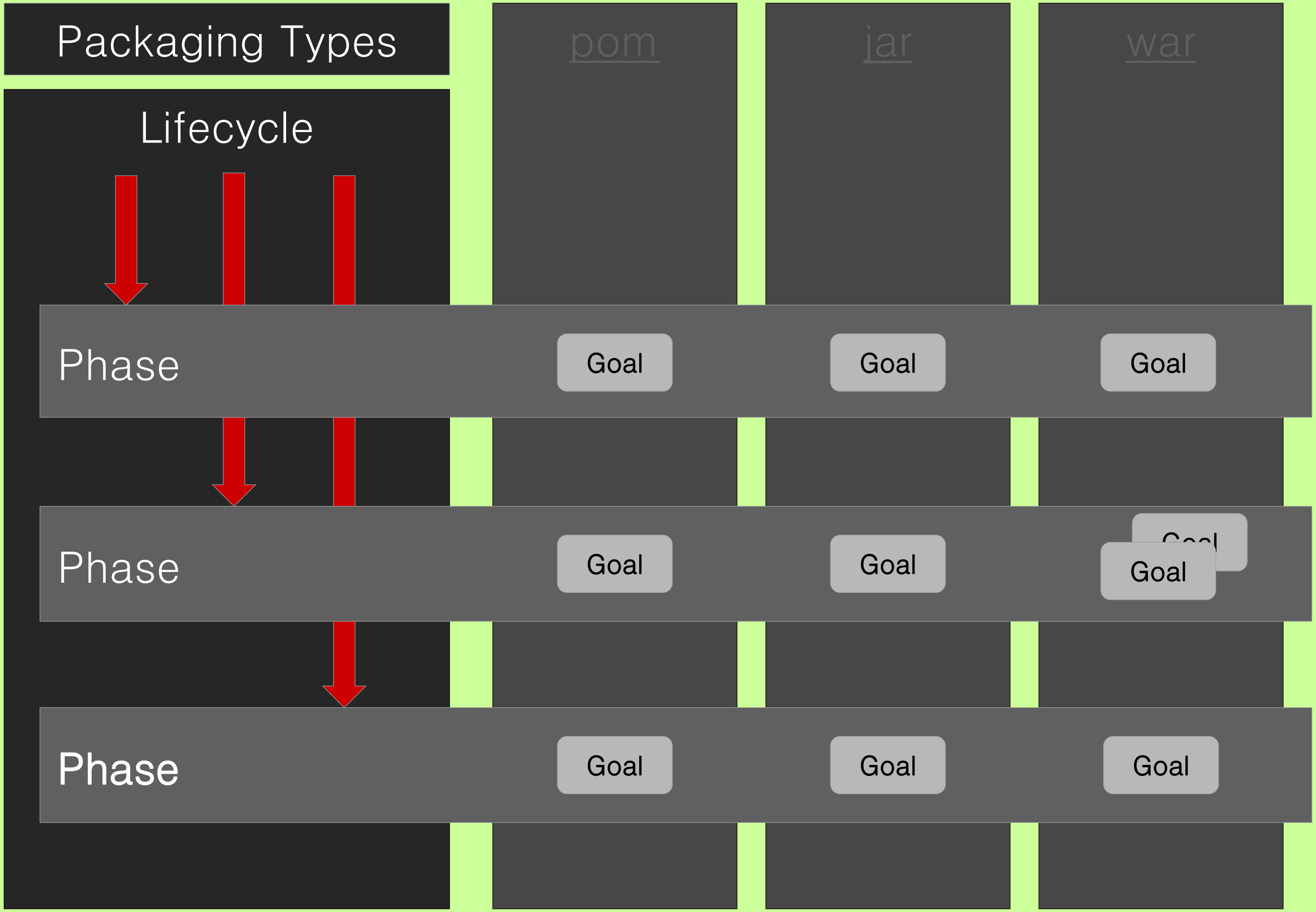
POM Relationships

- Dependencies
  - Scopes
  - Exclusion
- Parent/Child
  - Inheritance
    - When things need to be shared
- Aggregator/Module
  - Orchestrate the build
    - When things need to be build together
- Parent/Child vs Aggregator/Module

POM

- Packaging Type e.g. pom, jar, war, ear
- Build
  - Lifecycle (controlled by packaging type)
    - Phases
      - Goals attached to phases
        - Contributed by **Plugins**
  - Standard Lifecycles
    - Clean
    - Default
    - Site

Lifecycle (visualization)



Packaging Types

pom

jar

war

Lifecycle

Phase

Goal

Goal

Goal

Phase

Goal

Goal

Goal

Goal

Phase

Goal

Goal

Goal

Standard Lifecycles – default

Lifecycle	Phases	Packaging		
		pom	maven-plugin	jar
		plugin*:goal		
Default				
	validate			
	initialize			
	generate-sources			
	process-sources			
	generate-resources		plugin:descriptor	
	process-resources		resources:resources	resources:resources
	compile		compiler:compile	compiler:compile
	process-classes			
	generate-test-sources			
	process-test-sources			
	generate-test-resources			
	process-test-resources		resources:testResources	resources:testResources
	test-compile		compiler:testCompile	compiler:testCompile
	process-test-classes			
	test		surefire:test	surefire:test
	prepare-package			
to target folder	package	site:attach-descriptor	jar:jar plugin:addPluginArtifactMetadata	jar:jar
	pre-integration-test			
	integration-test			
	post-integration-test			
	verify			
to .m2/ Respository	install	install:install	install:install plugin:updateRegistry	install:install
to group repository	deploy	deploy:deploy		deploy:deploy

* maven-pluginname-plugin – convention over configuration

Standard Lifecycles – clean

	Phases	Packaging		
		pom	maven-plugin	jar
Lifecycle		plugin:goal		
Clean				
	pre-clean			
	clean			clean:clean
	post-clean			

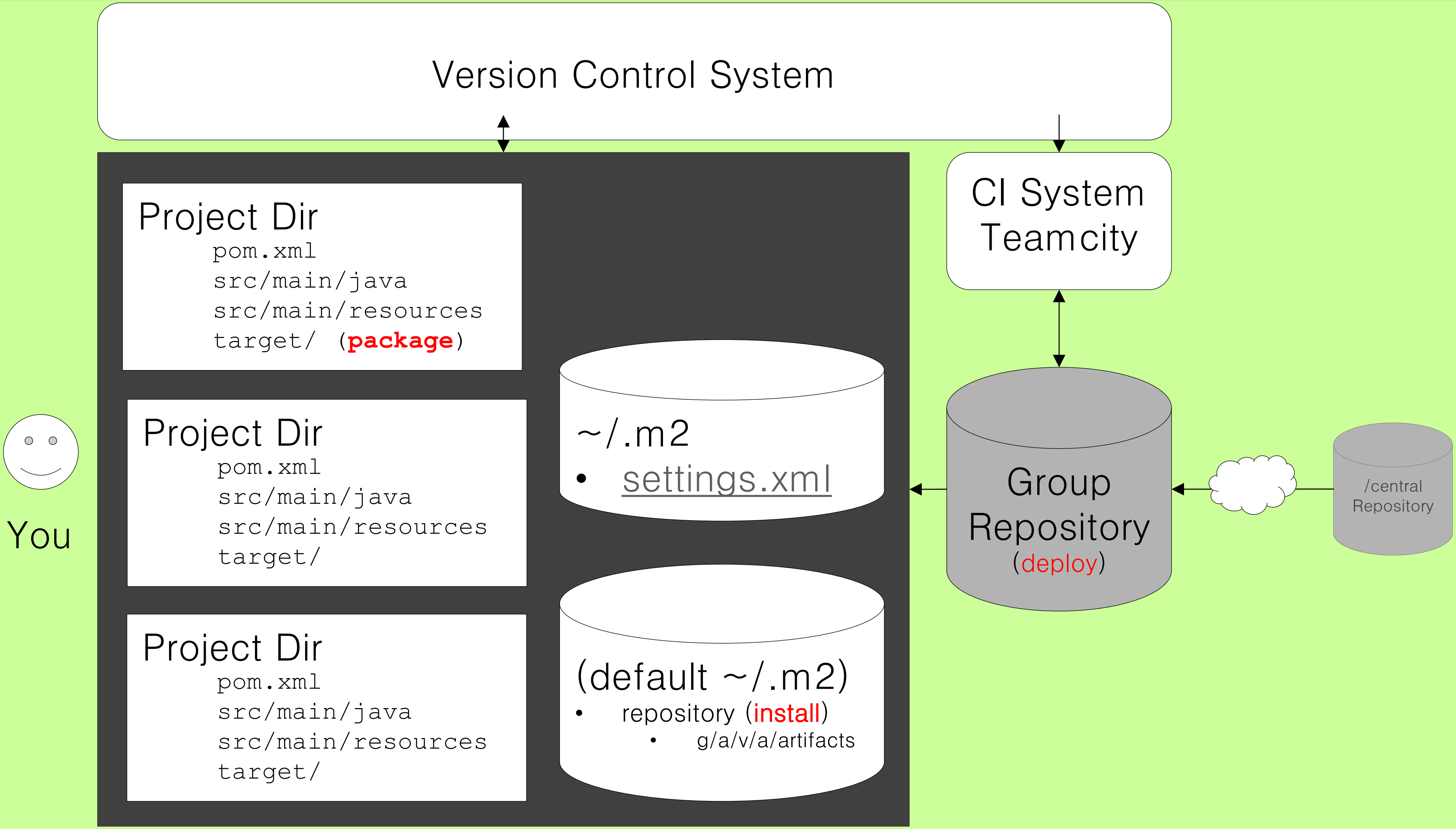
Standard Lifecycles – site

Lifecycle	Phases	Packaging		
		pom	maven-plugin	jar
		plugin:goal		
Site				
	pre-site			
	site	site:site	site:site	site:site
	post-site			
	site-deploy	site:deploy	site:deploy	site:deploy

Dependencies

- GAV
  - Versions
    - SNAPSHOT
    - Release
      - maven-release-plugin
    - Version Ranges [(,)]
- Scope
  - Compile
  - Test
  - Provided
  - Runtime
  - System (not portable/not reccomended)

Architecture



Version Control System

Project Dir
pom.xml
src/main/java
src/main/resources
target/ (**package**)

Project Dir
pom.xml
src/main/java
src/main/resources
target/

Project Dir
pom.xml
src/main/java
src/main/resources
target/

~/.m2
- settings.xml

(default ~/.m2)
- repository (install)
  - g/a/v/a/artifacts

CI System
Teamcity

Group
Repository
(deploy)

/central
Repository

You

Settings

- Location of repositories
  - Remote
  - Cache
- Profiles

Archetypes

- Standardize Project Structures
- Templating mechanism

POM 360

- Makes heavy use of
  - maven-help-plugin
  - maven-dependency-plugin
- Implemented using
  - node-webkit
  - AngularJS
    - UI Router
  - Bootstrap

M2E

- Embedded Maven+Eclipse integraion
- Maven POM is the boss
  - pom.xml -> .project and .classpath
- Ties into Eclipse incremental Build
- Launch Configurations for maven builds
- Structured pom.xml editor
- New Maven Project Wizard
- Import Maven Project from Team Repo support

Tycho

- Maven based Eclipse builds to build
  - Plugins|Features|Update Sites| Products
- Replaces clucky P2 builds
- Eclipse is the boss
  - .project and .classpath -> pom.xml
- Packaging types
  - Plugins|Features|Update Sites| Products
- Tycho plugin goals to build

Reference

Maven Reference (download)
M2E
Tycho
POM 360

Q&A

Thanks!