



Maven the Beautiful City

Healthy, Viable, and Productive
Development Infrastructures

A Gentle Introduction to Maven

What is Maven?

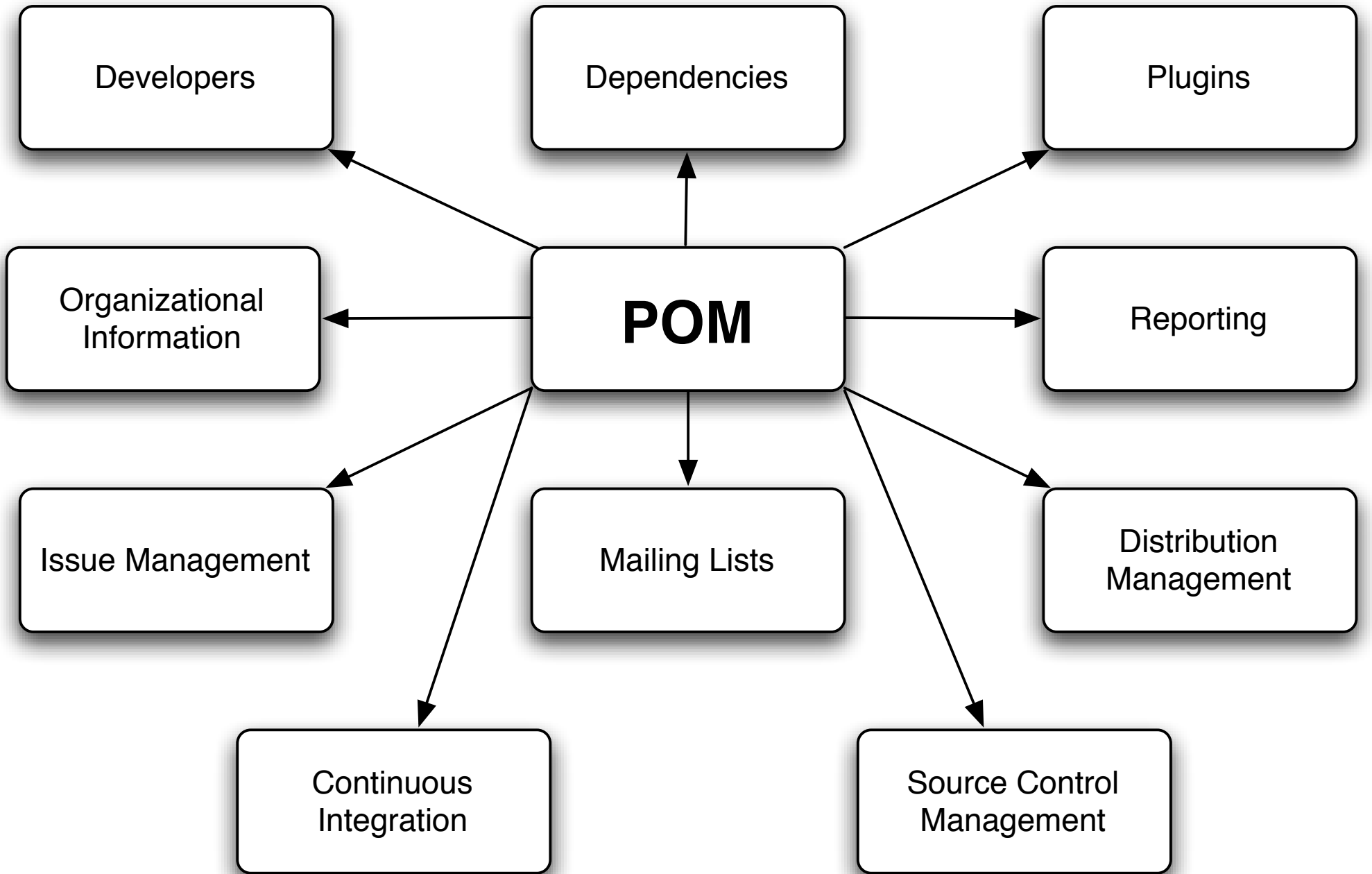
- Build tool
 - Similar to Ant but fundamentally different
- Dependency management tool
 - Similar to Ivy, but not bolted on as an afterthought in the process
- Site management tool

FedEx®
Express



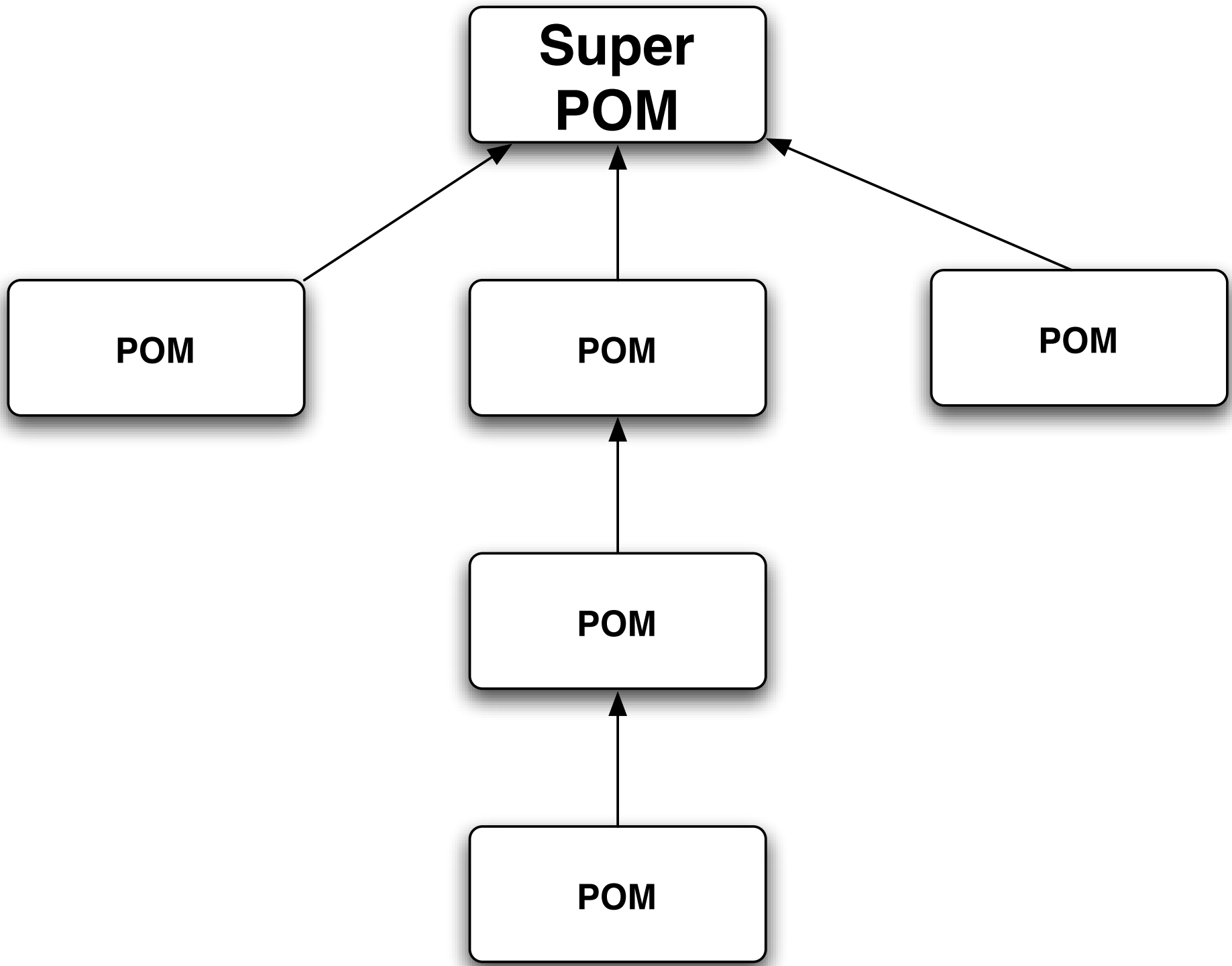
What Maven really is ...

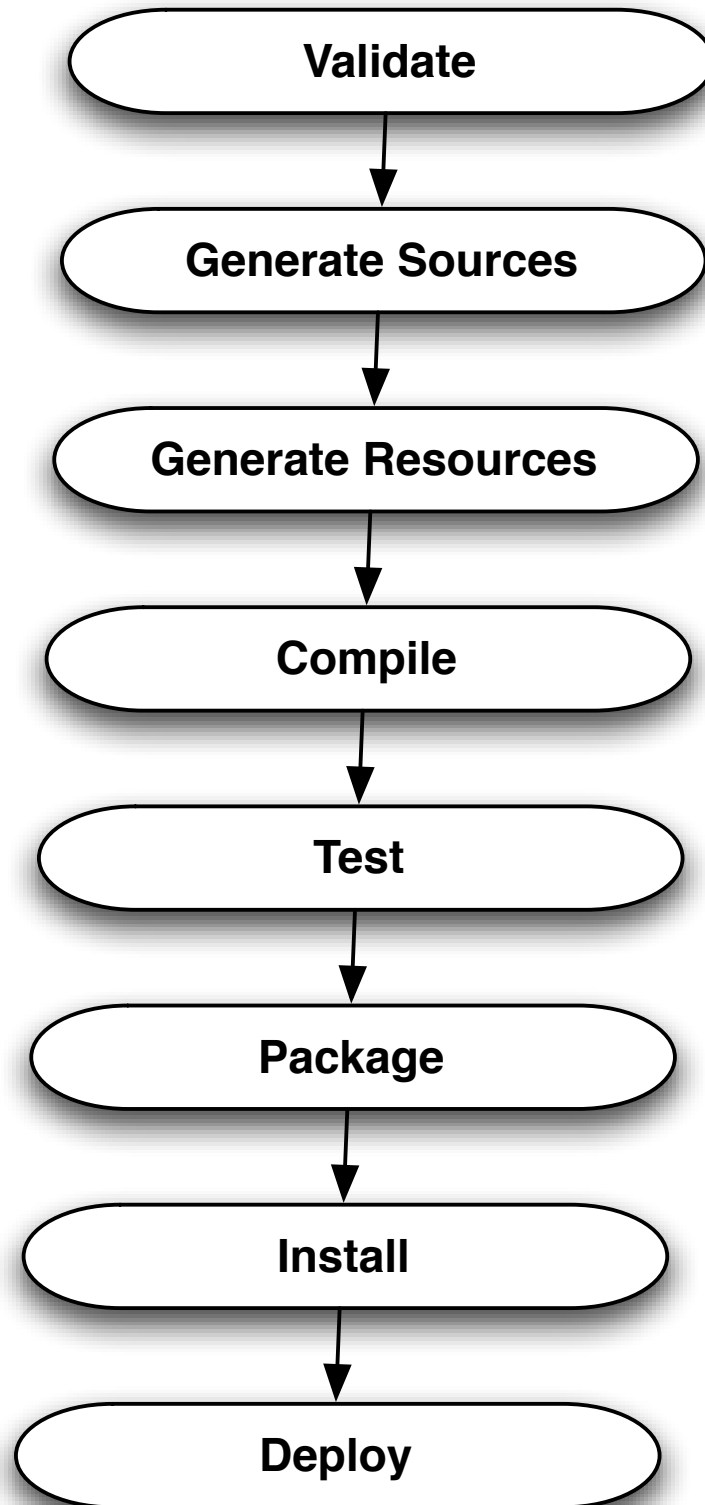
- Model for software projects
- Patterns for software development and development infrastructures
- Ultimately the basis for a new form of team collaboration which provides healthy environments for developers



Simple Project Object Model

```
<project>
  <modelVersion>4.0.0</modelVersion>
  <groupId>com.iona.superapp</groupId>
  <artifactId>superapp</artifactId>
  <version>1.0-SNAPSHOT</version>
  <name>Maven Quick Start Archetype</name>
  <dependencies>
    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>3.8.1</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
</project>
```





Development Infrastructures

- Development Infrastructures must provide facilities for:
 - Building
 - Testing
 - Documenting
 - Continuous Integration
 - Releasing
 - Artifact/Asset Management
 - Provisioning

A consistent model and patterns makes ...

- Automation easier
 - Continuum
 - Hudson
 - Bamboo
 - Maven release testing using Gatekeeper
- Tooling easier
 - Dependency metadata (Netbeans)
 - Project metadata (Mylar)
 - Plugin metadata
 - Standard lifecycle
- Real dependency analysis possible

Why can't I just use Ant?

- You certainly can, but Ant provides
 - no conventions
 - directory structures
 - naming
 - separation of concerns
 - testing as a first class citizen (4 out of 47)
 - no models
 - SuperPOM & POM
 - Lifecycle
 - processes
 - nothing the release toolchain

Maven Sucks!

- <http://bluxte.net/blog/2006-09/17-52-51.html>
- <http://www.bearaway.org/wp/?p=518>
- <http://www.1060.org/blogxter/publish/5>
- The Bile Blog
- I hate XML! I want to use a real scripting language!
- Maven is restrictive! I can't do exactly what I want!

Infrastructure, Portland, Winnipeg and Maven

- Intentional infrastructure
 - You have to invest in your infrastructure to yield returns
 - It must be carefully planned, infrastructures don't just happen
- Long-term sustainability
 - The key is keeping people involved
 - sustainability by virtue versus sustainability by force
- Healthy growth in mind
 - Some constraints are necessary
- Promotion of community
 - Create opportunities for people to interact

Questions about infrastructure

- Do you think your infrastructure is wildly different than anyone else's?
- Is your infrastructure a competitive advantage?
- Would you like help with the most difficult infrastructure problems you might face?

Inherent utility

- The infrastructure should provide a lot to make complicated tasks easier
- When complicated tasks are made easy, there is more time for the bigger picture
- What's in the bigger picture?

Maven & Social Capital

- Term coined by Jane Jacobs (The Death and Life of Great American Cities)
- People's ability to work together in groups
- Creation of real communities using the idea of patterns and conscious planning
- Examples of the Maven community working together
 - Improving project metadata and repositories
 - Release toolchain at Apache

Each bundle can contain one or more resources

Remote Resource Bundle

Remote Resource Bundle

Remote Resource Bundle

Remote Resources Plugin

Velocity

Add Resource to POM

Plugins pick up shared resources

JARs/WARs/EARs

The remote resources plugin takes the bundles, puts them in a ClassLoader and hands it off to Velocity.

Each resource from each bundle is processed through Velocity. The POM is pushed into the Velocity context.

All resources once processed are placed in `${basedir}/target/maven-shared-archive-resources` and a Resource entry is added to the POM which corresponds to that directory.

Any archiving plugin that is aware of the shared archive resources Resource entry in the POM can pick them up and insert them into the archive it creates.

All archives created by projects using Maven now have their all their legal requirements for packaging satisfied transparently

Mavens Objectives

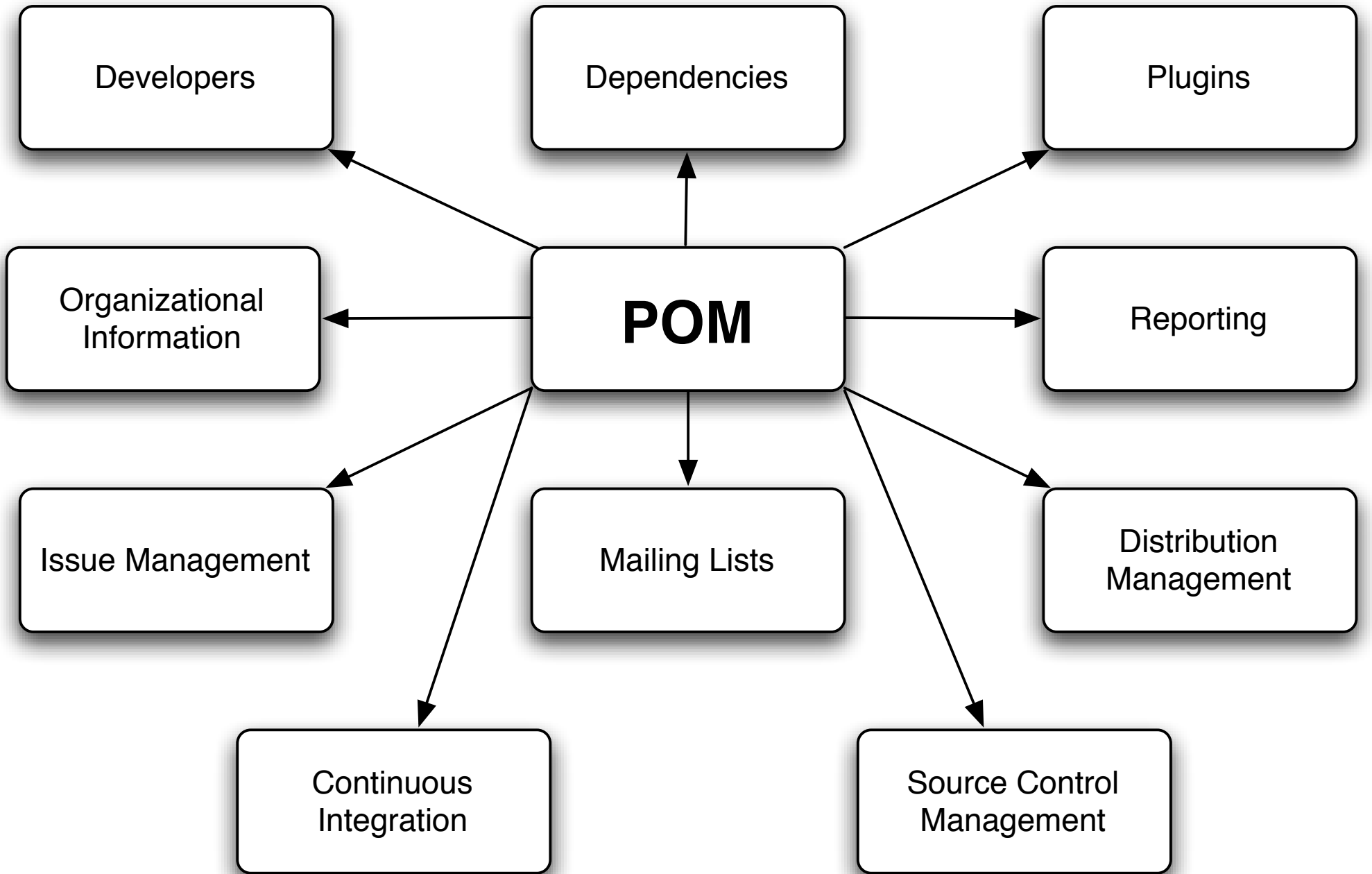
- Standards and Best Practices for build infrastructures
 - We use standard APIs and best practices when developing applications: Maven pushes this practice down to the level of infrastructure
- Provide a shared language for build infrastructure management
 - Patterns for build infrastructures in the spirit of “A Pattern Language” by Christopher Alexander
- Create healthy and robust build infrastructures that hold up to high degrees of flux

Mavens Principles

- Model driven development
- Convention over configuration
- Reuse and encapsulation of build logic
- Coherent organization of dependencies

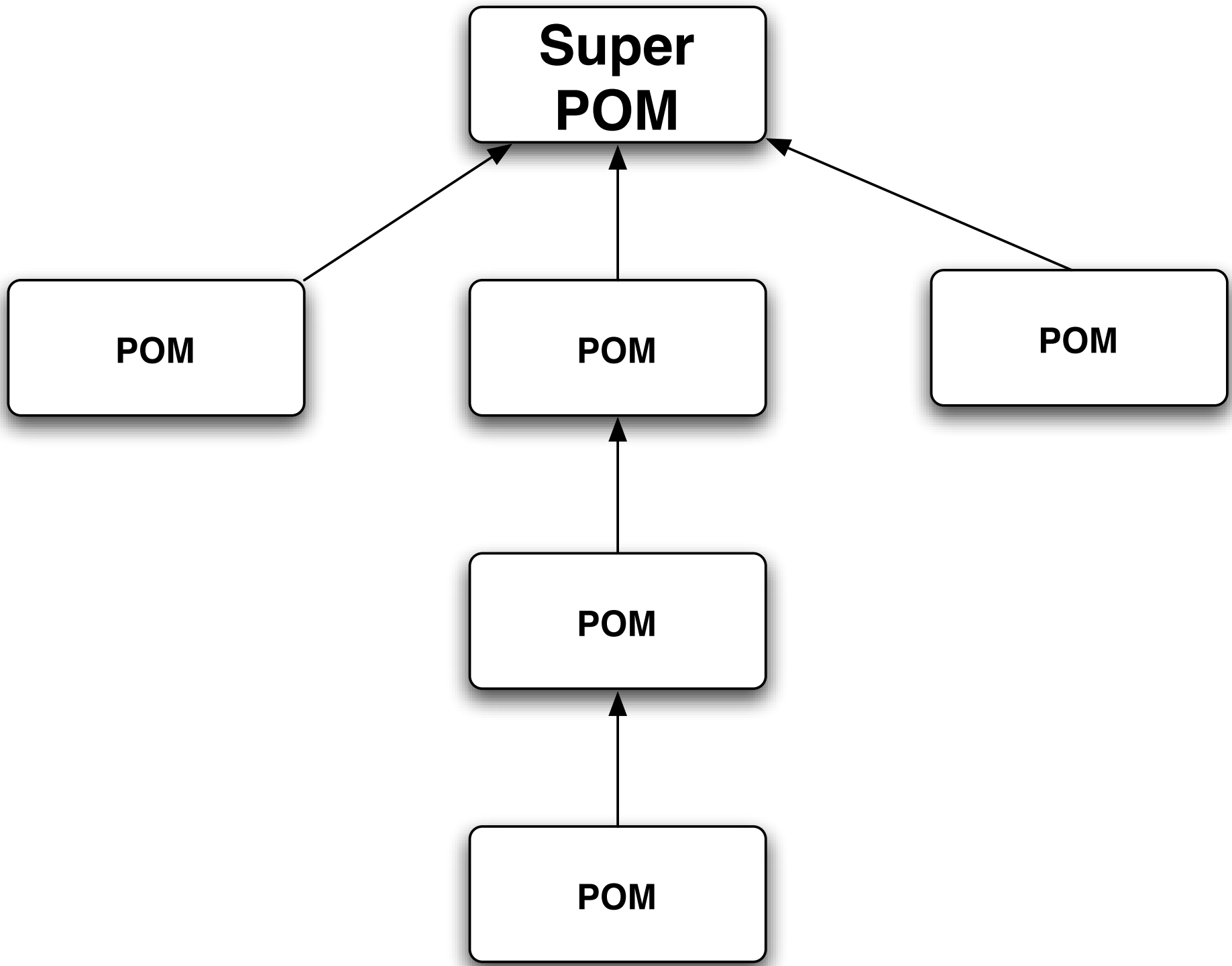
Model driven development

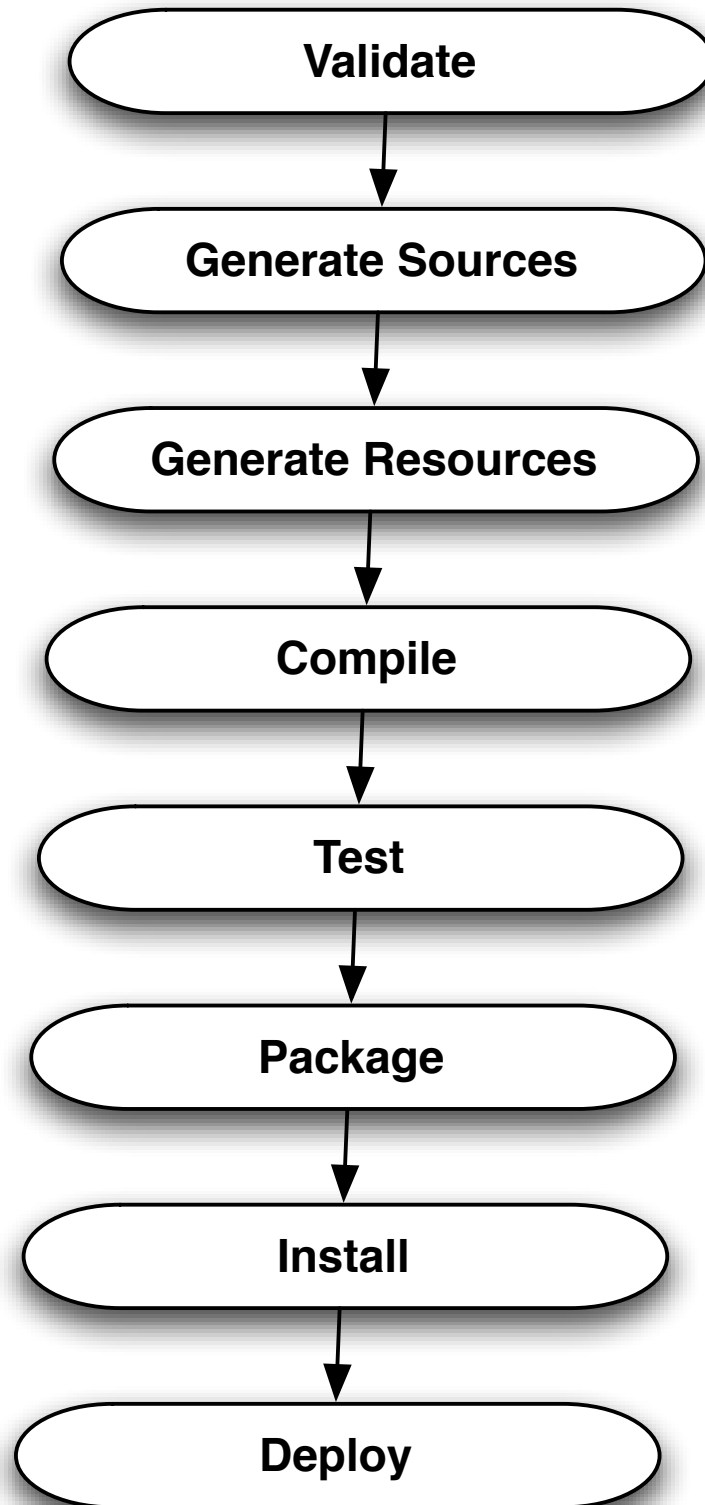
- Maven's project object model (POM)
- Maven's build life cycle



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Convention over configuration

- Standard directory layout
- One primary artifact per build
- Standard naming conventions

Encapsulation and reuse of build logic

- All build logic is encapsulated in plugins
- Maven is a plugin execution framework
- Plugins can be applied to all Maven projects

Coherent organization of dependencies

- Say what you need, not where or how to get it
 - Dependencies in Maven are requested in a declarative fashion
- Artifacts and Repositories
 - Remote repositories for the satisfaction of dependencies
 - Local repository is the developers personal analog to a set of remote repositories

Maven checks the local repository for the required dependencies



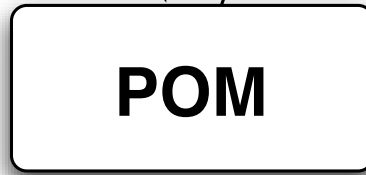
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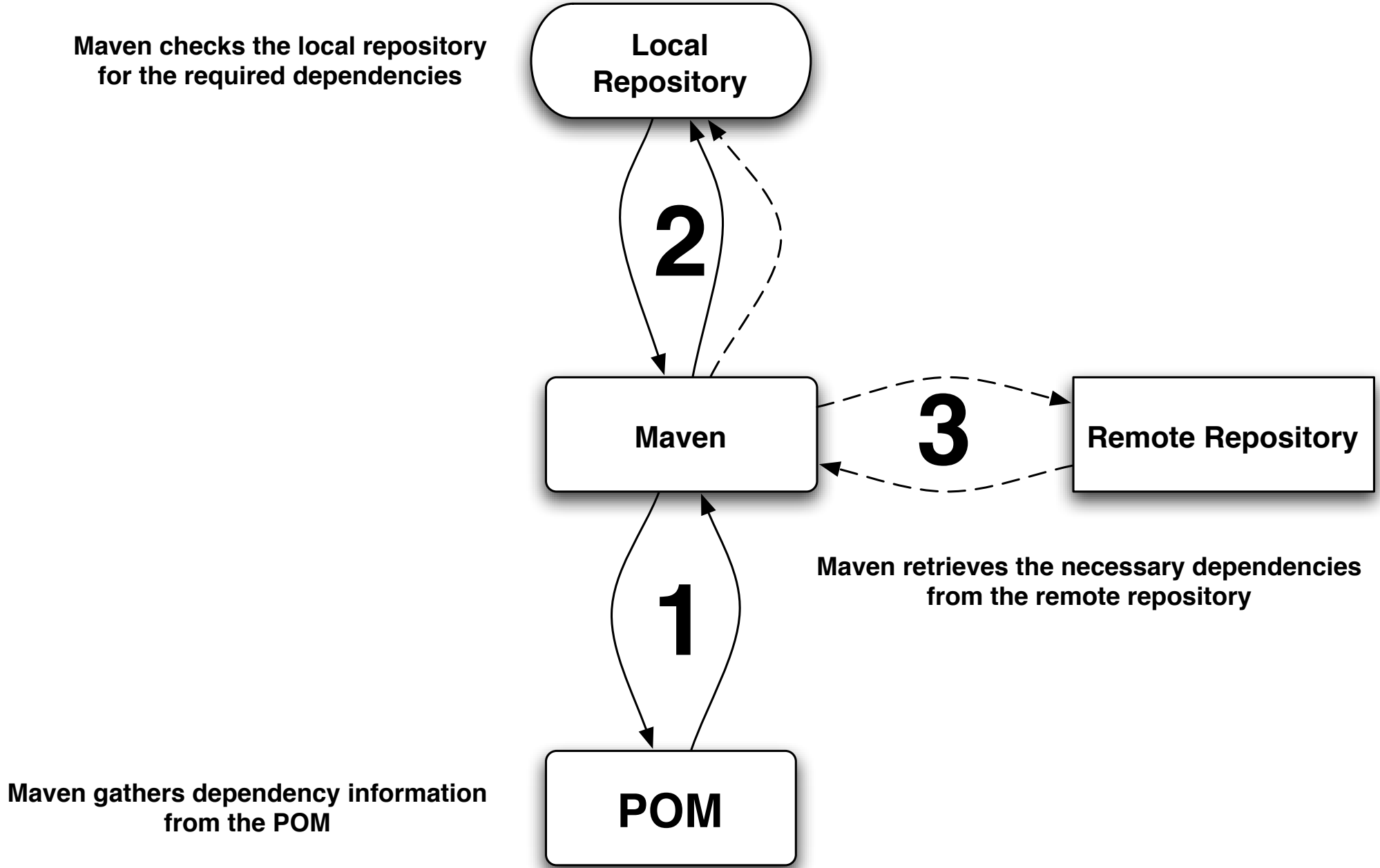
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Maven retrieves the necessary dependencies from the remote repository

1



Maven gathers dependency information from the POM



What Maven Provides

- Coherence - An orderly, logical, and aesthetically consistent relation of parts
- Reusability - Reuse not only of software components but the best practices of an entire industry
- Agility - Maven allows easier integration and project straddling
- Maintainability - Maven projects are more maintainable as there are far fewer surprises

Benefits of Maven

- Relieves the burden of project and build maintenance
- Easy for new users to embrace Best Practices
- Focus on adding value to your applications
- Draw upon the community for solutions

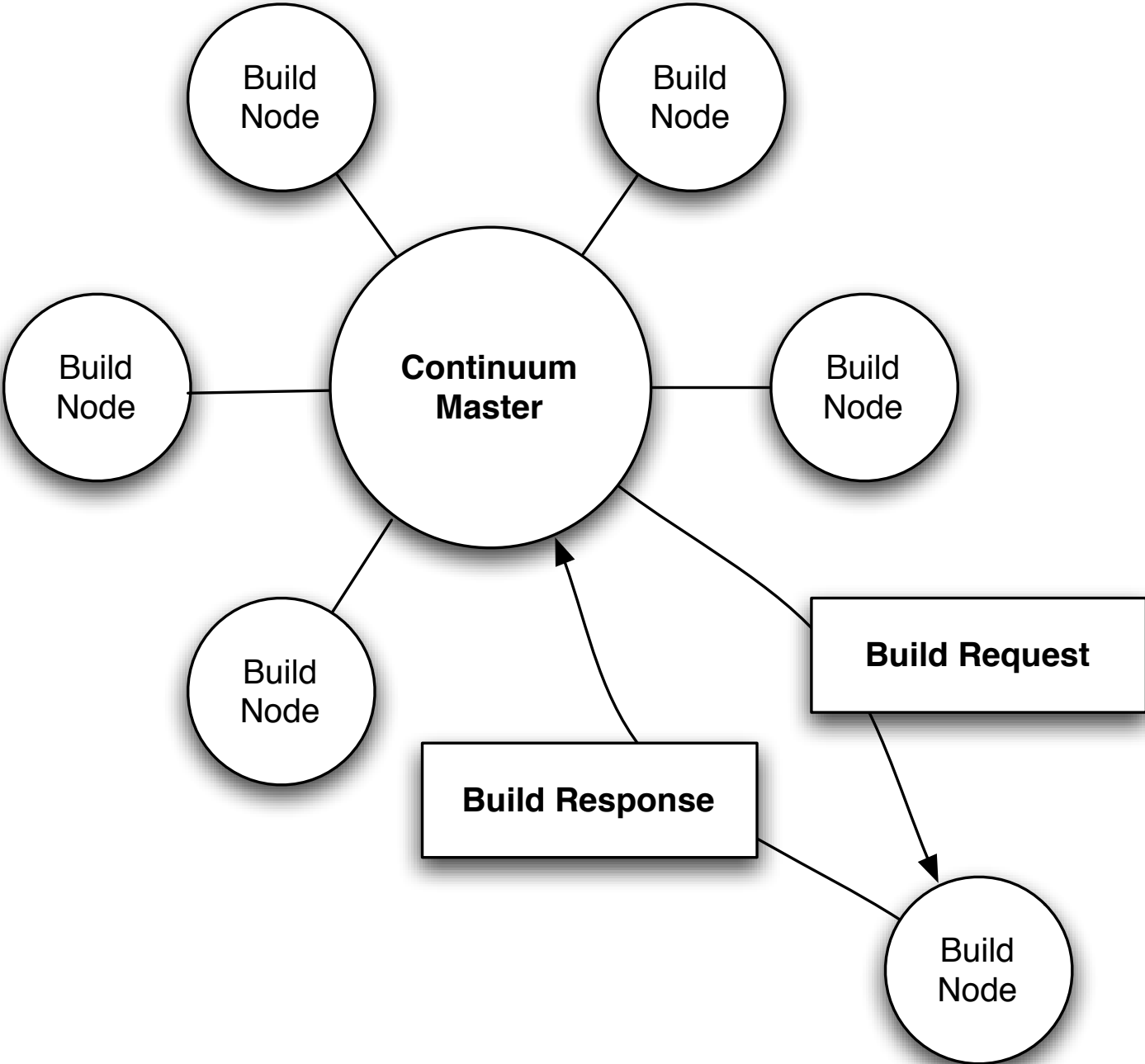
Apache Maven Projects

- Maven
- Archetype
- Doxia
- SCM
- Surefire
- Wagon
- Issue Management
- Wiki Management

Archetypes

- A very easy way to get a project up and running
- A way to encapsulate your priorities for projects in template form
- Are distributed and sharable like any other Maven artifact

Distributed CI



Maven Doxia

- Parsers
 - APT (almost plain text)
 - FML (FAQ markup)
 - XDoc (Maven 1.x XML format)
 - Docbook
 - XHTML
 - Twiki
 - Confluence
 - OmniOutliner (will be complete May 1st)
- Sinks
 - Docbook
 - Latex
 - RTF
 - XDoc

Maven SCM

- CVS
- Subversion
- ClearCase
- Perforce
- StarTeam
- Visual Source Safe
- Bazaar
- Synergy (in progress)
- SVK (in progress)

Maven Surefire

- JUnit
- TestNG
- JUnit4
- Scripted testing
 - Jython
 - JRuby
- Use any source of information for tests
 - Text file
 - XML file

Maven Wagon

- HTTP/S
- SSH
- SFTP
- DAV
- FTP
- File
- S3
- Bittorrent (in progress Eric Redmond & Paul Gardner of Azureus)

Maven Enterprise

Maven Enterprise

SCM View
FishEye

Wiki
Confluence

Issue Management
JIRA

IRC Server
Plexus

Email
QMail

Forum Management
Jive

Jabber Server
Plexus

Email Lists
Subetha

Blog Management
Pebble

User Management
ApacheDS (LDAP)

SCM
Subversion

Repository Management
Maven Repository Manager

Project Creator
Project from POM

Quality Dashboard

Team Project Server

Interesting News

- Maven 2.0.6
- Maven 2.1-alpha-1 (next week)
- Eclipse Integration
 - Headless build solutions
 - Mylar Integration
- Netbeans Integration
- IDEA Integration
- Amazon S3 Wagon
- Bittorrent Wagon
- Improved Central Repository Infrastructure

Questions?

- Do have any questions about Maven?