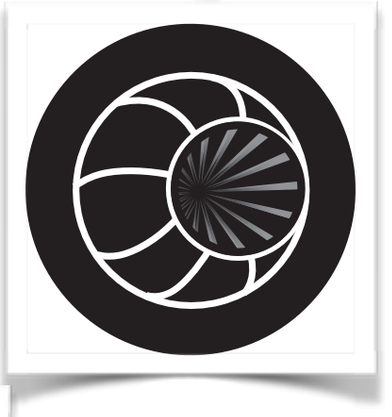
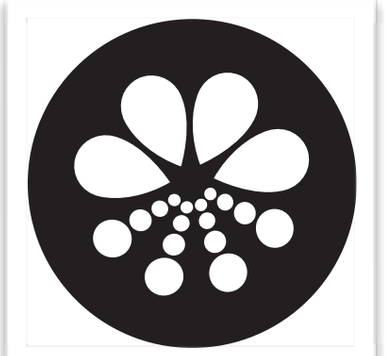
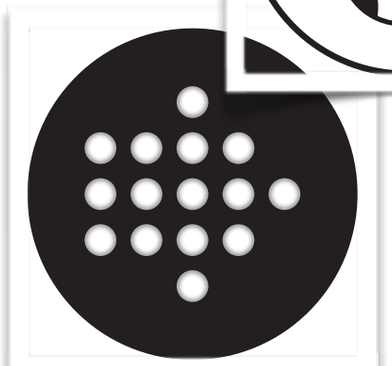
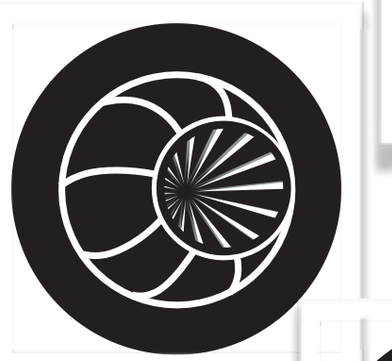
OSGi enRoute

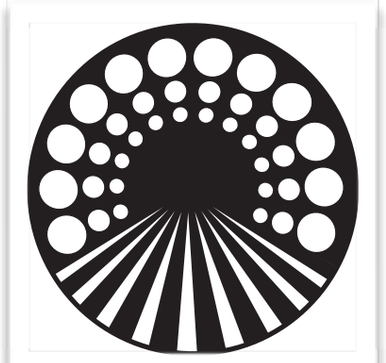
An Development Chain for OSGi

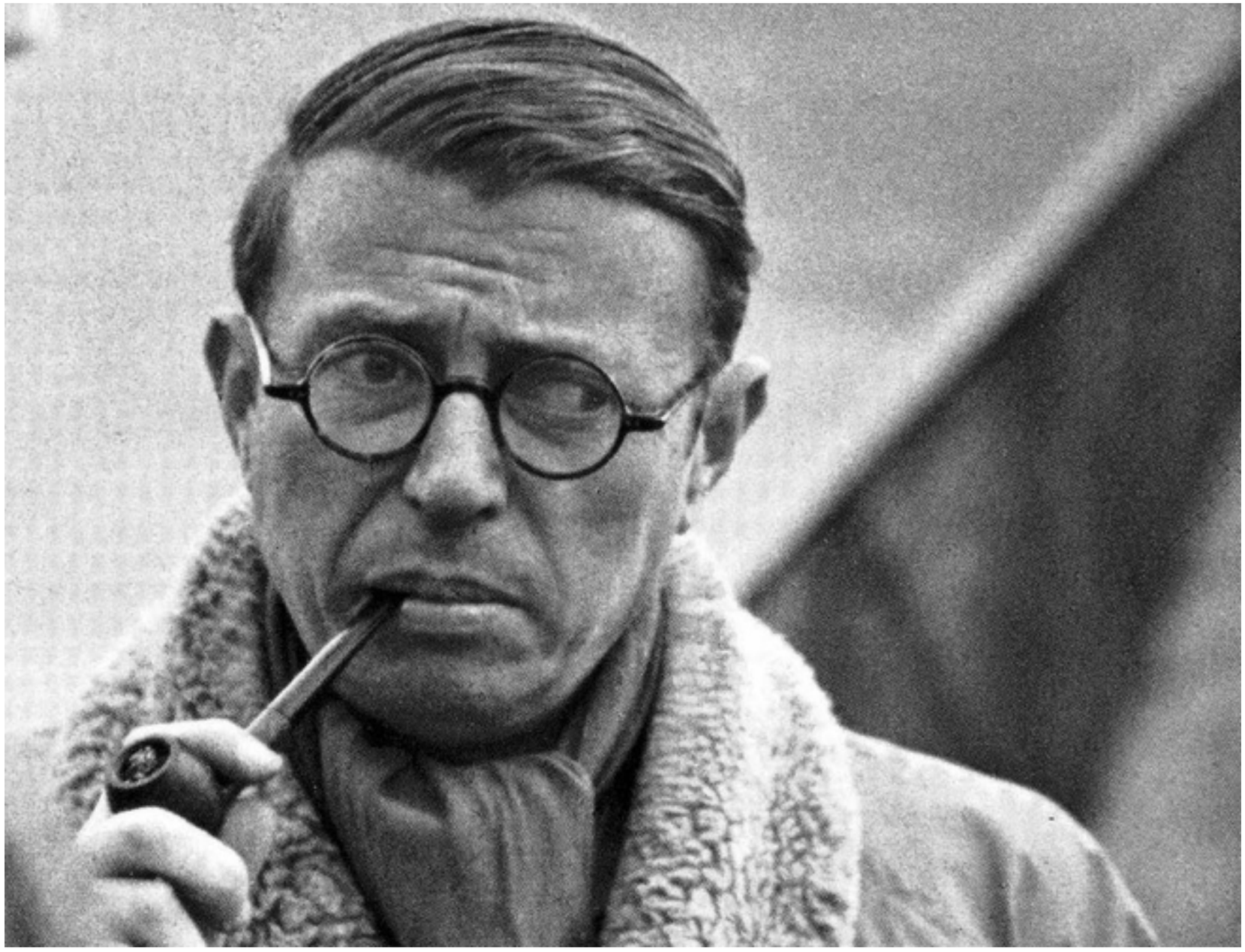
αβ









The existential question

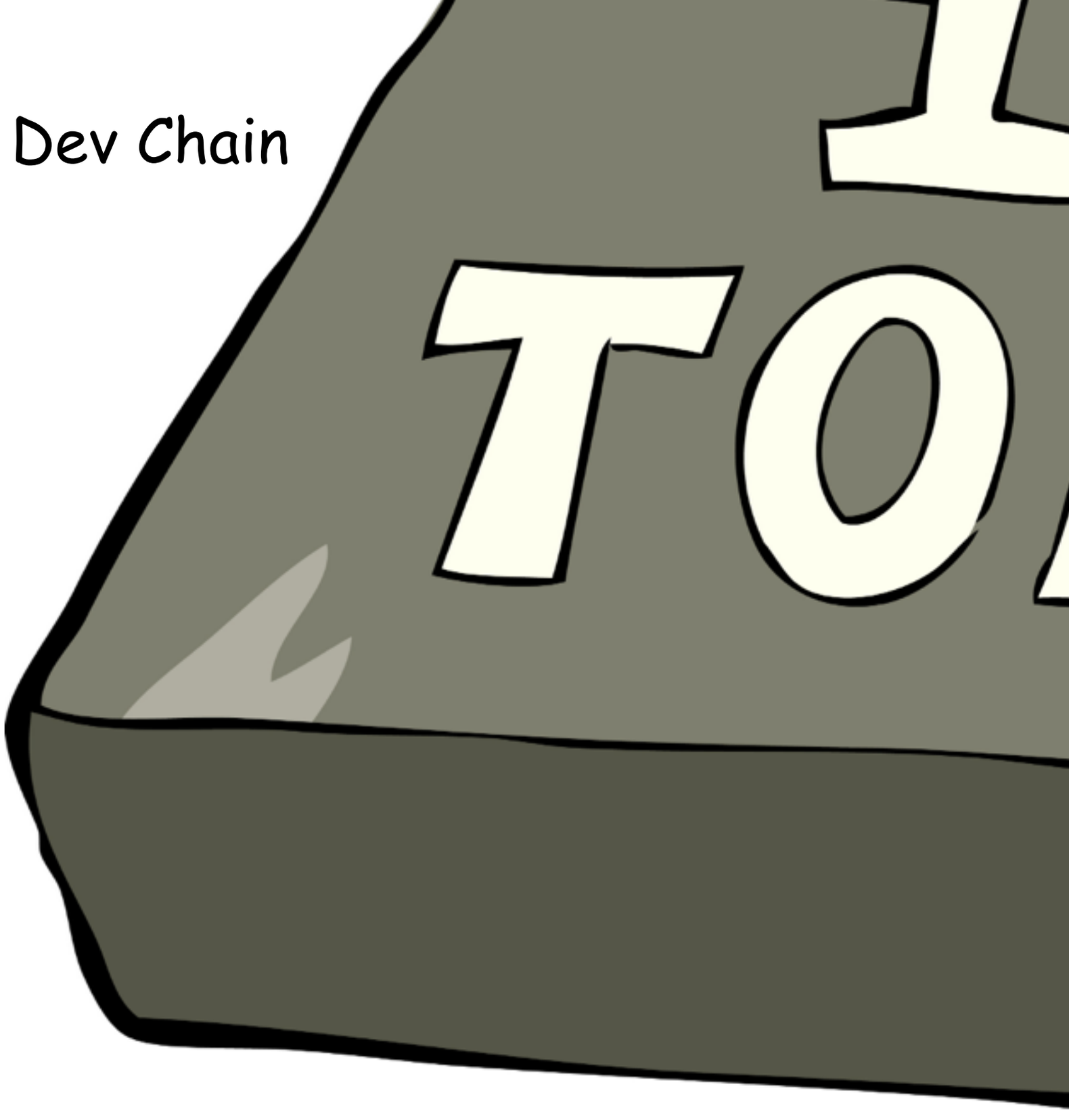
Why OSGi?

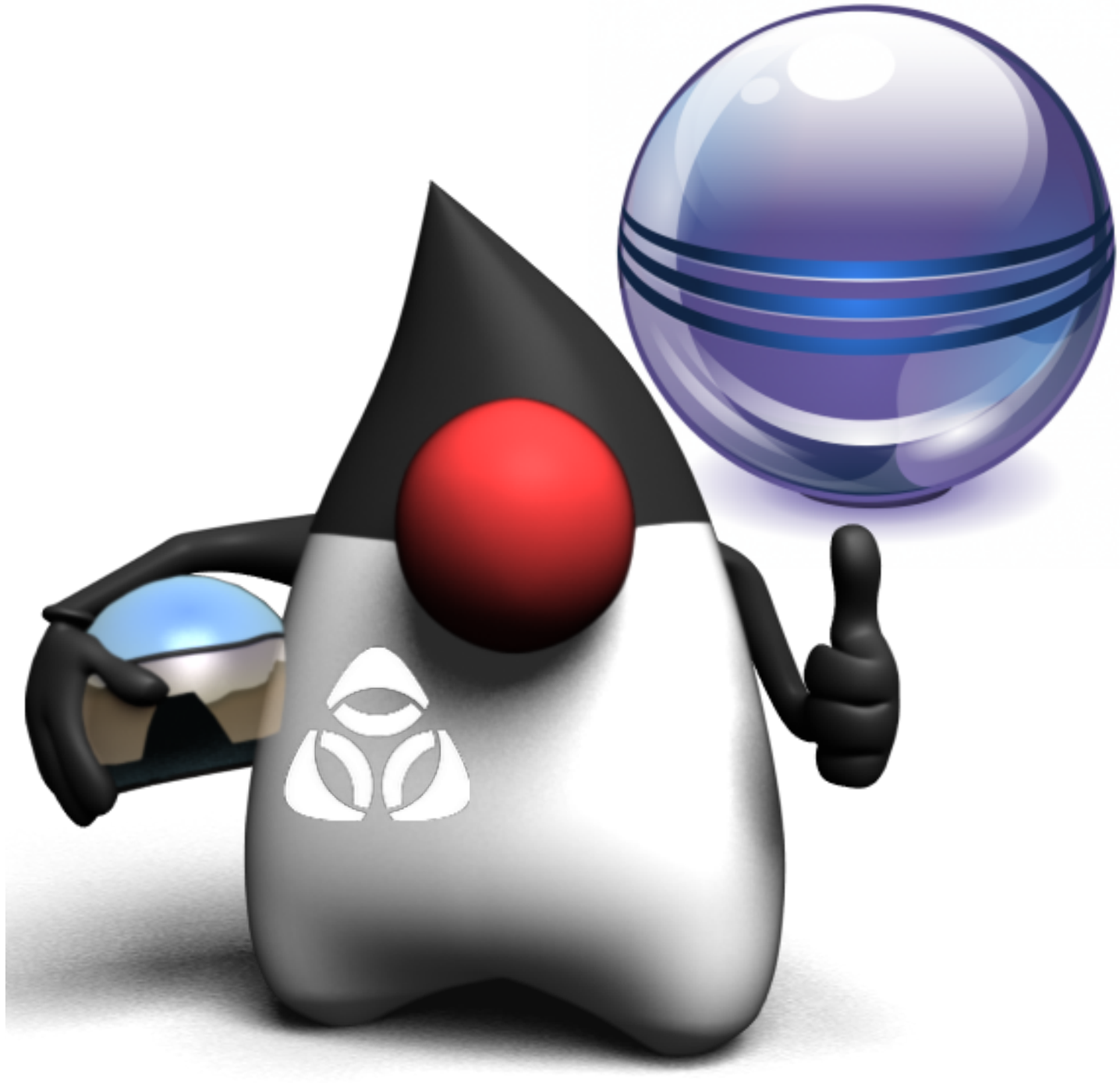
“Hello World”

… is not a benchmark

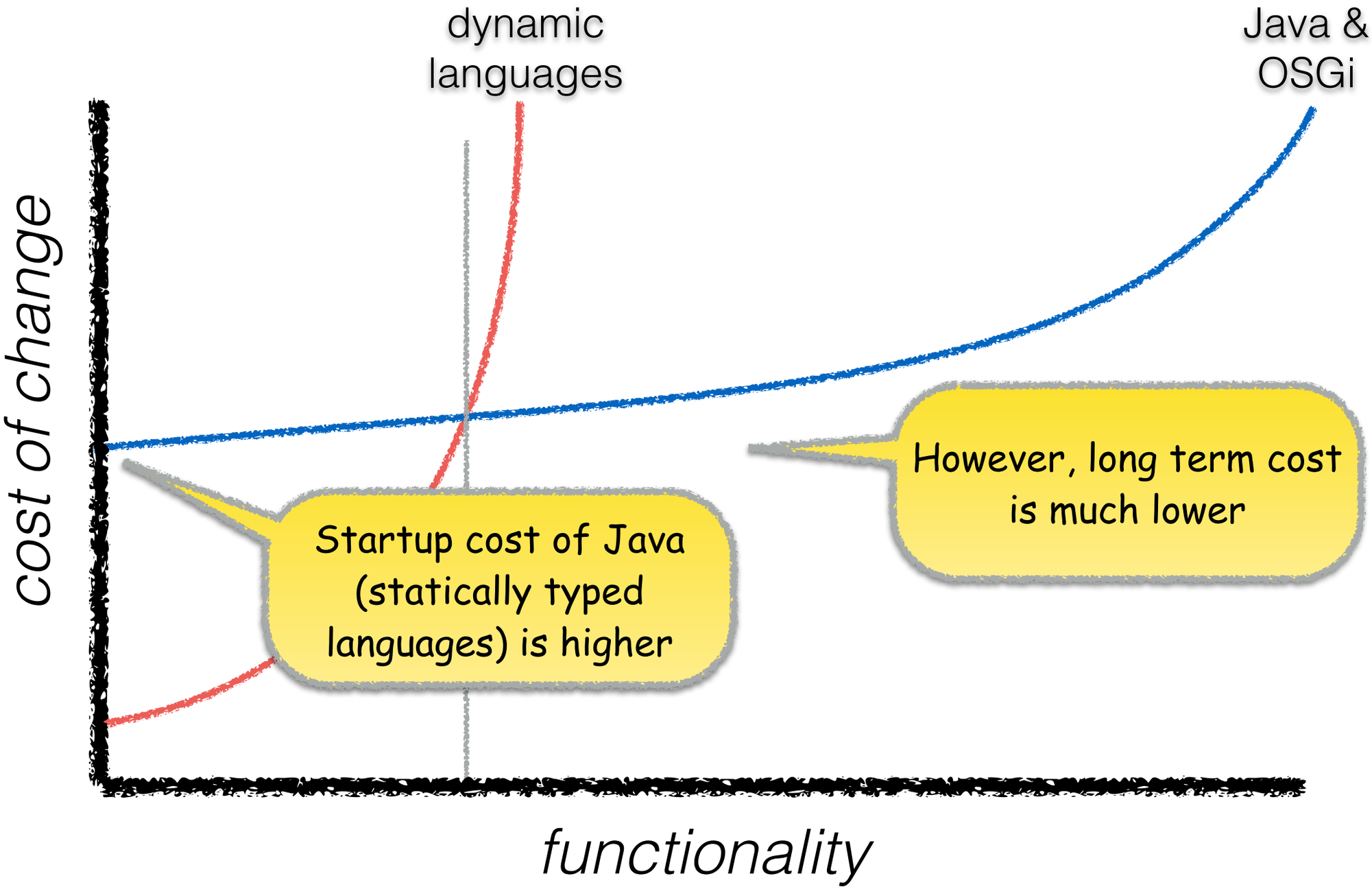
Dev Chain

Language





Small versus Large



Javascript

```
target.foo(15,"abc");
```

You **HOPE** target implements foo …

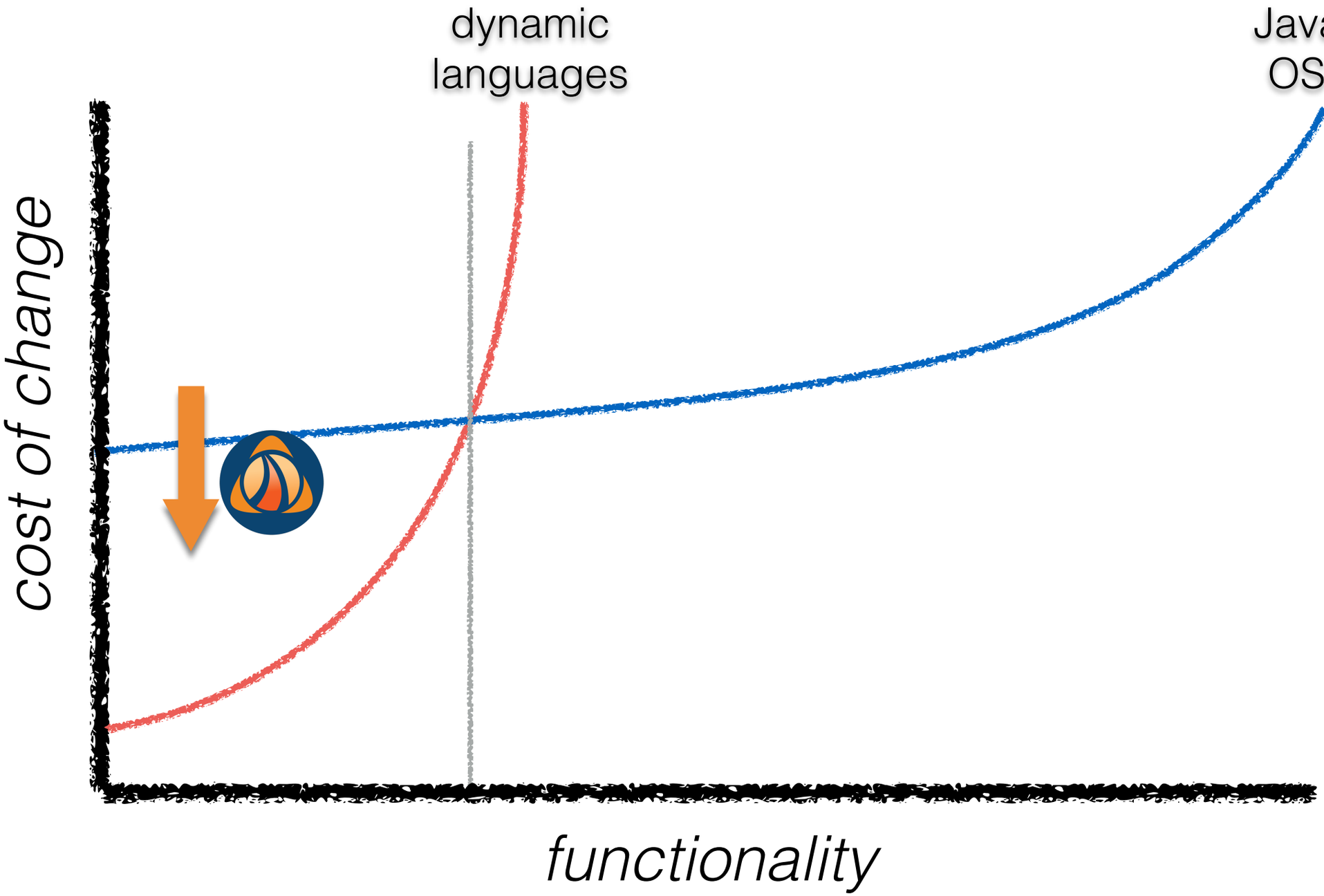
Java

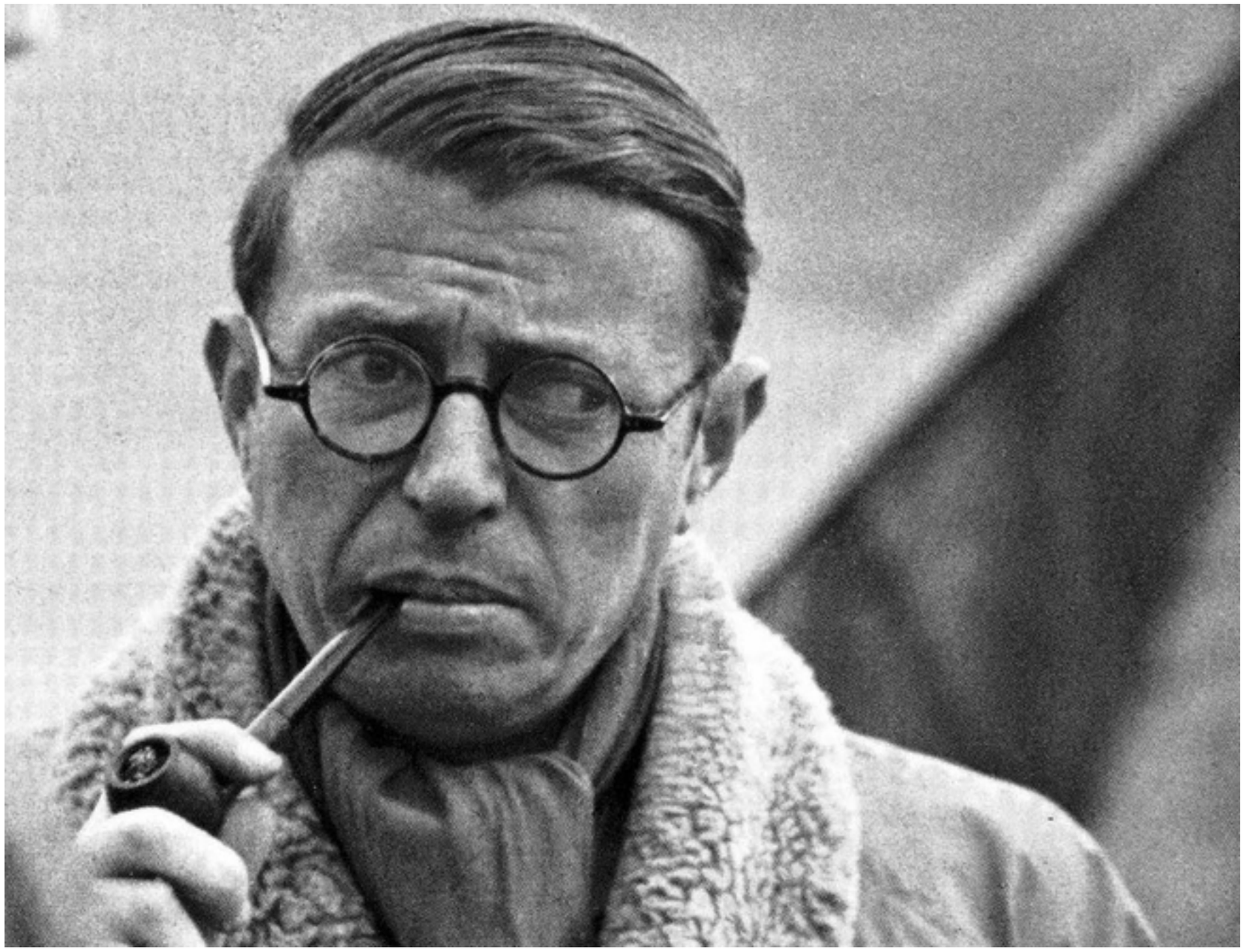
```
target.foo(15,"abc");
```

You **KNOW** target implements foo …
and expects an integer
and a string

Your IDE knows exactly who is using this

What is OSGi enRoute?



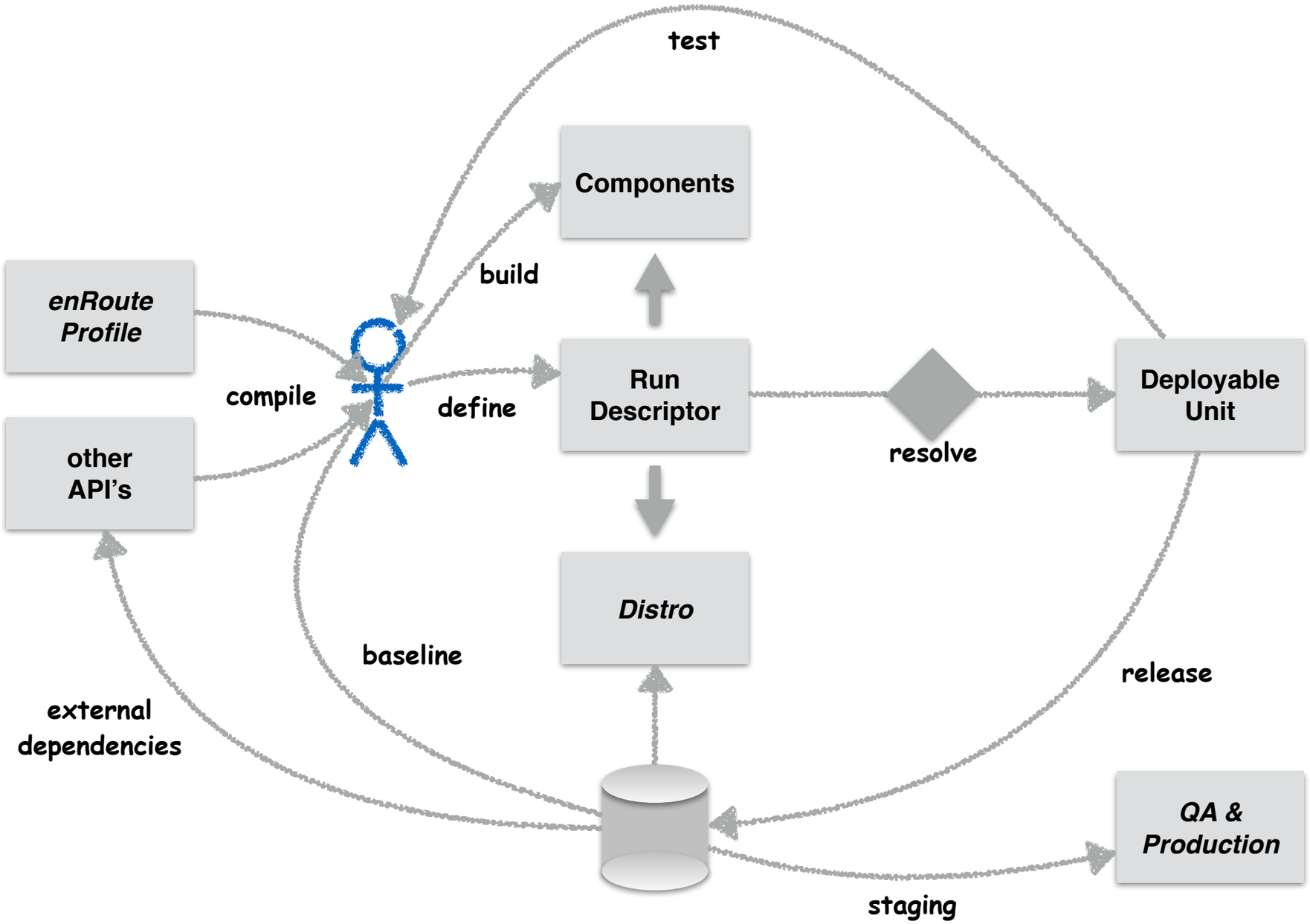


How?

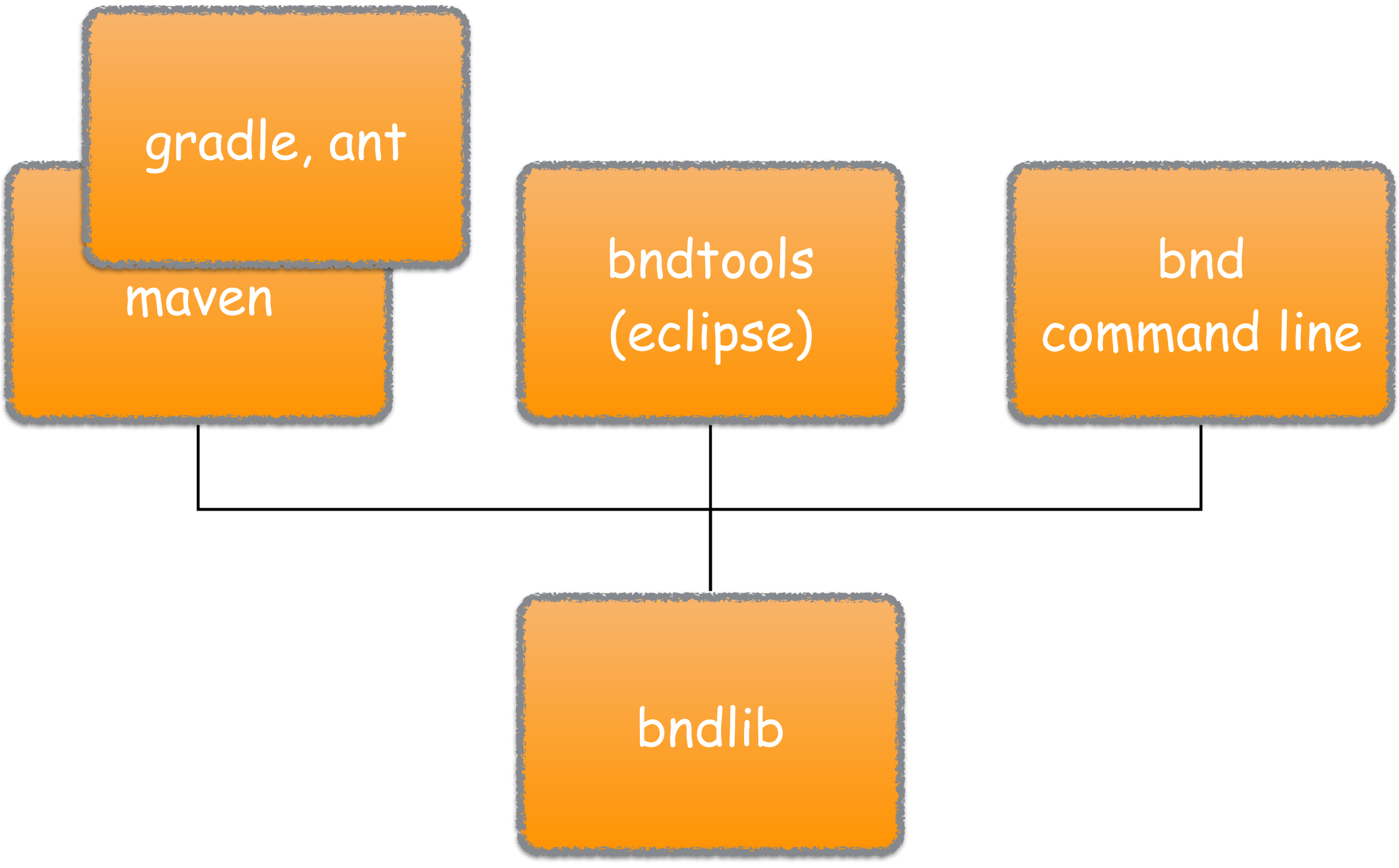
OSGi enRoute

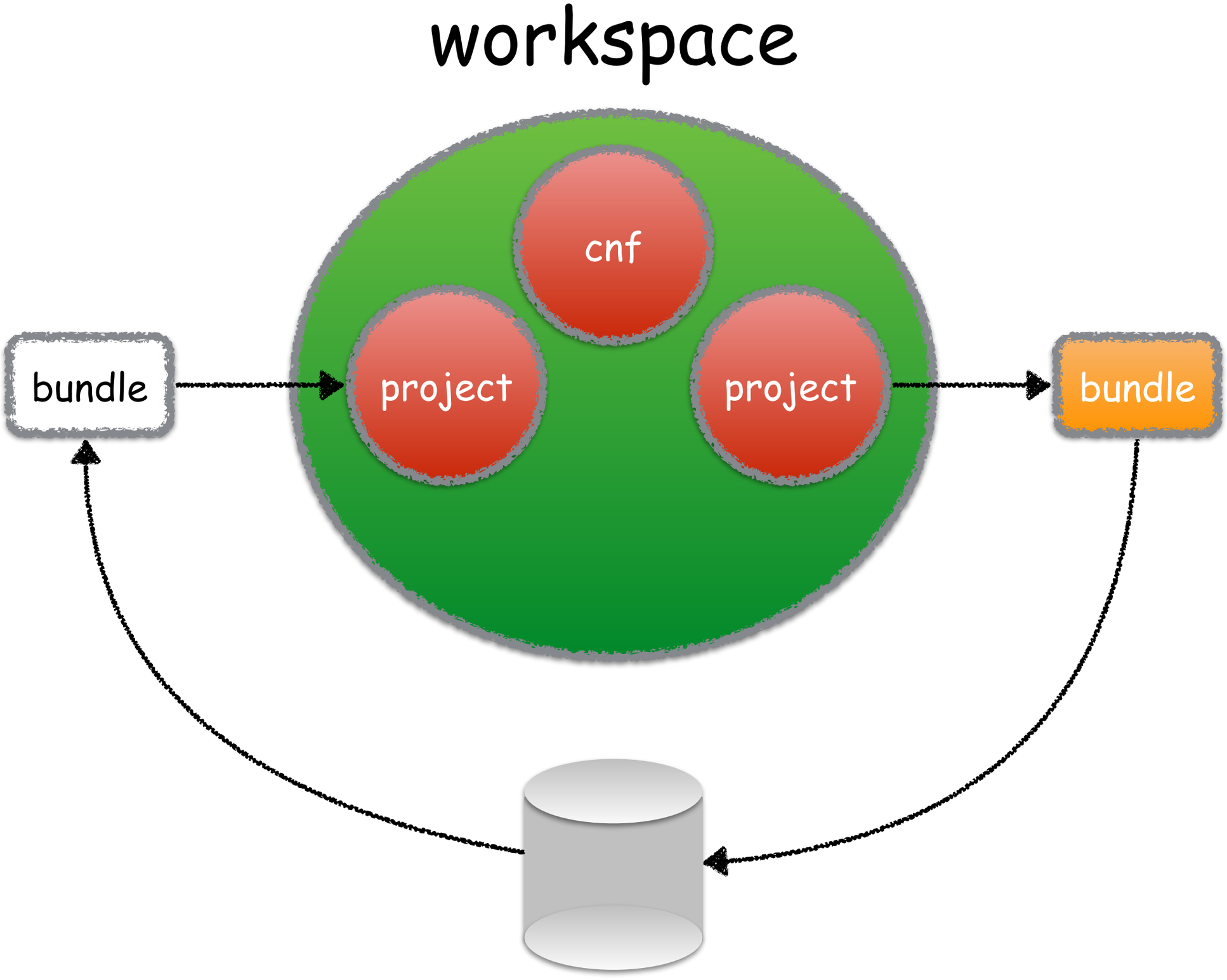
- µService Oriented Programming
  - To reduce system complexity
- Dependency Management
  - To reduce errors in development & operations
- Tooling
  - To reduce time to market
- Documentation & Training
  - To reduce confusion with developers

Development Process



bnd, the little engine that built …


gradle, ant
maven
bndtools
(eclipse)
bnd
command line
bndlib


workspace
cnf
project
project
bundle
bundle

profiles

Profiles

- A *profile* is specific catalog of *specifications* that vendors can provide in a *distribution*.

- An OSGi Profile consists of

  - ***µ*Services** — Specifications of either OSGi Alliance or external µservices.

  - **Extenders** — An extender provides support functionality to OSGi bundles.

  - **Capabilities** — A capability describes a feature/function/ resource of the underlying system in abstract format.

Profiles

- Each OSGi enRoute Profile is represented by a clean signed JAR library that can be used to build bundles against.
- This is a **specification** only library,
  - It can not introduce unwanted dependencies, or
  - Let developers accidentally use proprietary features of a vendor

Planned Profiles

- **java 1.8** — All profiles are based on Java 1.8
- **base** — A minimum profile, mostly as common base and for demonstrations. It provides support for the best practices in our industry.
- **base.debug** — Supports developing and debugging
- **web** — Web application development optimized for single page web apps.
- **web.debug** — Supports developing and debugging web apps.
- **persistence** — Provides support for JPA on OSGi

Base Profile

- **OSGi Core Framework** — R6
- **OSGi Compendium** — ConfigurationAdmin, Coordinator, EventAdmin, LogService, MetaTypeService,UserAdmin
- **Logging** — Extensive Java Logging and SLF4J (dynamic!) logging support. Both service based an statics.
- **OSGi enRoute Support**
  - **Requirements and Capabilities** — Completely developed with the R&C model in mind
  - **Specifications in code** — Extensive support to use Java classes and interfaces to also specifies non-Java aspects. E.g. license headers, forms, versioning, etc. Mostly through annotations.

Base Profile

- **OSGi enRoute services**
  - **Authenticator and Authority** — For extensible security
  - **ConfigurationDone** — To signal end of initialization at startup
  - **DTOs** — Extensive support for Data Transfer Objects (JSON, conversion, diffing, named access)
  - **Launched** — Provides access to startup parameters
  - **LoggerAdmin** — Administrative front end to logging. Can handle OSGi, SLF4J, and Java Logging
  - **java.util.Timer** — Scheduled tasks
  - **java.util.concurrent.Executor** — Background tasks

Bndtools – Eclipse – /Ws/metadata/temp

Java | Bndtools | Debug

Package Exp | Type Hierarc

cnf

Repositories

Enter search string

Workspace temp

Local

Central

Release

New Bnd OSGi Project

Project Templates

Select Template:

- Component Development (OSGi Declarative Services)
- API Project
- OSGi enRoute (alpha)
- Integration Testing
- Empty Project

Description:

Creates a project for developing with enRoute base profile, a profile for basic OSGi applications. The profile is implemented in different . The name of the project must be a Bundle Symbolic Name (e.g. com.example.foo). The last segment of this name has special meaning for the chosen project template.

- — Create an example project with some stub code that demonstrates the key features of OSGi enRoute, like multiple bundles in one project, executable jars, debug configurations, etc. Choose this to play with bndtools/enRoute.
- — Create an API project. Use this when you have a service API that should be shared with others, i.e. it must be releasable as a separate bundle.
- — Create a provider project. Use this when you create an implementation of a service specification.
- — Create an OSGi JUnit test project.
- — Create an application project. An application usually contains little or no code but

< Back | Next > | Cancel | Finish

Bndtools – com.acme.foo.database/bnd.bnd – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package Exp | Type Hierarc

- cnf
- com.acme.foo.database
  - src
  - test
  - JRE System Library [Java SE 8 [1.8.0]]
  - Bnd Bundle Path
    - osgi.enroute.base.api-1.0.0.2014
    - biz.aQute.junit-1.3.0.jar – cnf/ca
  - generated
  - api.bnd
  - bnd.bnd
  - com.acme.foo.database.bndrun
  - command.bnd
  - debug.bndrun
  - provider.bnd
  - readme.md

com.acme.foo.database

Project Build

3 warnings detected

Sub-bundles

If sub-bundles are enabled, then .bnd files other than "bnd.bnd" will be built as bundles.

☑ Enable sub-bundles

Build Path

The selected bundles will be added to the project build path for compilation.

- osgi.enroute.base.api 1.0
- biz.aQute.junit

Build Operations

Rebuild Project

Clean Project

Build | Run | Source

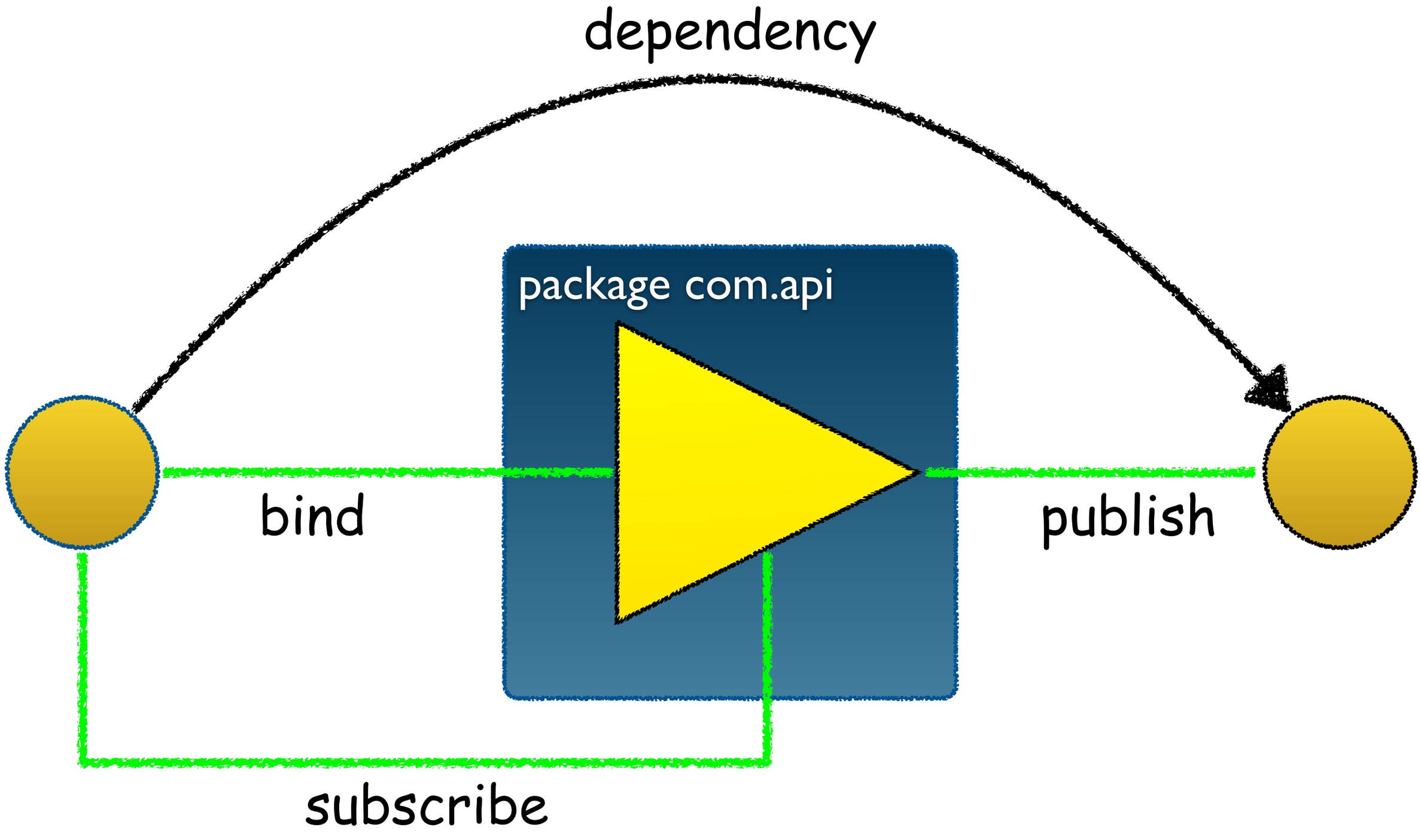
Repositories

Enter search string

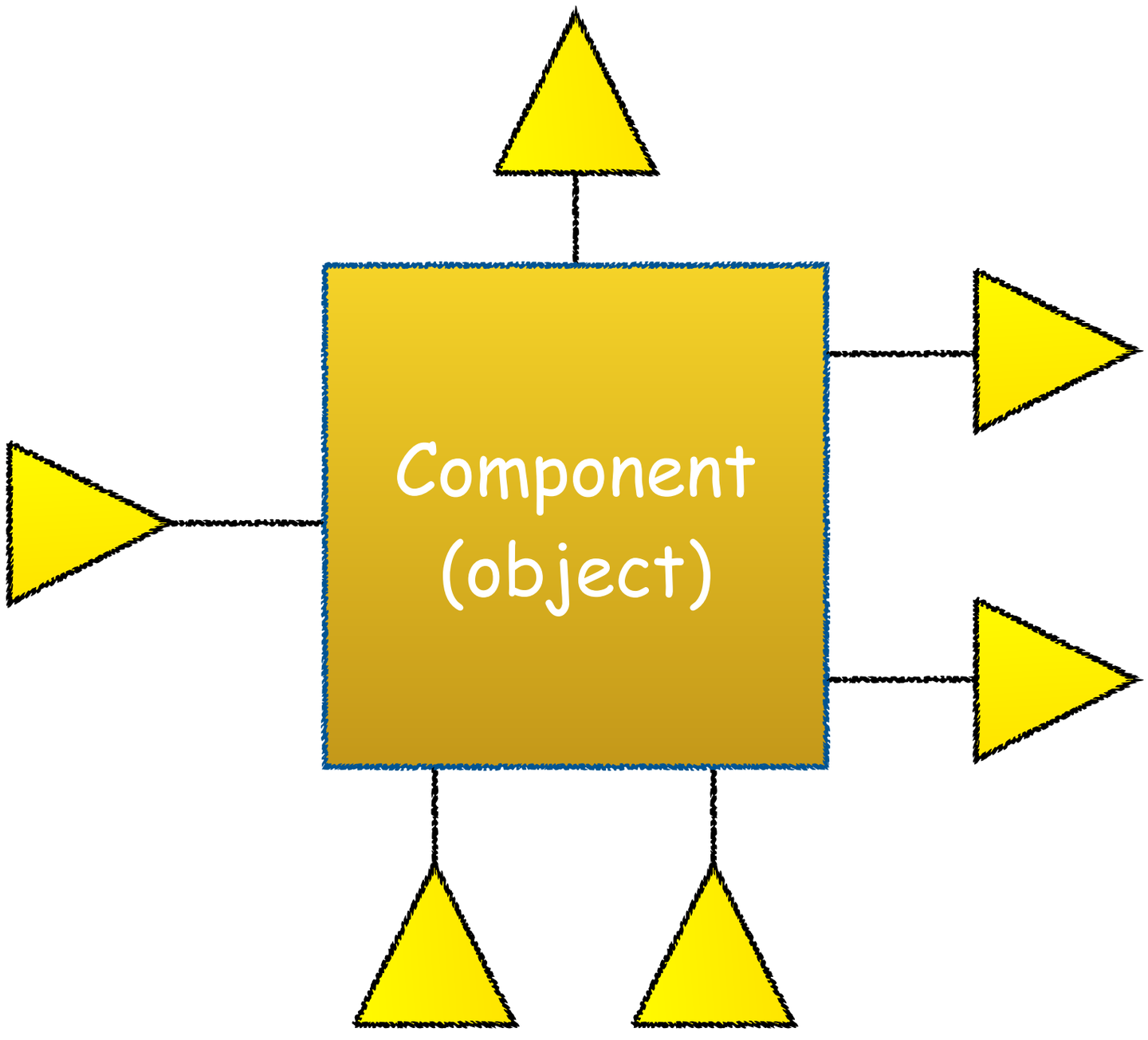
- Workspace temp
- Local
- Central
- Release

Problems | Javadoc | Imports/Exports | Console | Terminal

No consoles to display at this time.


dependency
package com.api
bind
publish
subscribe

Components



Bndtools - com.acme.foo.database/src/com/acme/foo/database/command/DatabaseCommand.java - Eclipse - /Ws/metadata/temp

Package Exp | Type Hierarc

- cnf
- com.acme.foo.database
  - src
    - com.acme.foo.database.api [1.0.0
    - com.acme.foo.database.commanc
      - DatabaseCommand.java
    - com.acme.foo.database.provider
      - DatabaseImpl.java
  - test
  - JRE System Library [Java SE 8 [1.8.0]]
  - Bnd Bundle Path
    - osgi.enroute.base.api-1.0.0.2014
    - biz.aQute.junit-1.3.0.jar - cnf/ca
  - generated
  - api.bnd
  - bnd.bnd
  - com.acme.foo.database.bndrun
  - command.bnd
  - debug.bndrun
  - provider.bnd
  - readme.md

Repositories

Enter search string

- Workspace temp
- Local
- Central
- Release

com.acme.foo.database | DatabaseImpl.java | DatabaseCommand.ja

```
1  package com.acme.foo.database.command;
2
3  import java.util.Map;
12
13 @Component
14 public class DatabaseCommand {
15     final static Logger log = LoggerFactory.getLogger(DatabaseCommand.class);
16
17     private Database target;
18
19     @Activate
20     void activate(Map<String,Object> props) {
21
22     }
23
24     public void databas(String message) {
25         target.say(message);
26     }
27
28     @Reference
29     void setDatabase(Database service) {
30         this.target = service;
31     }
32
33 }
34
```

Creates a component

Can (de)activate, gets configuration data

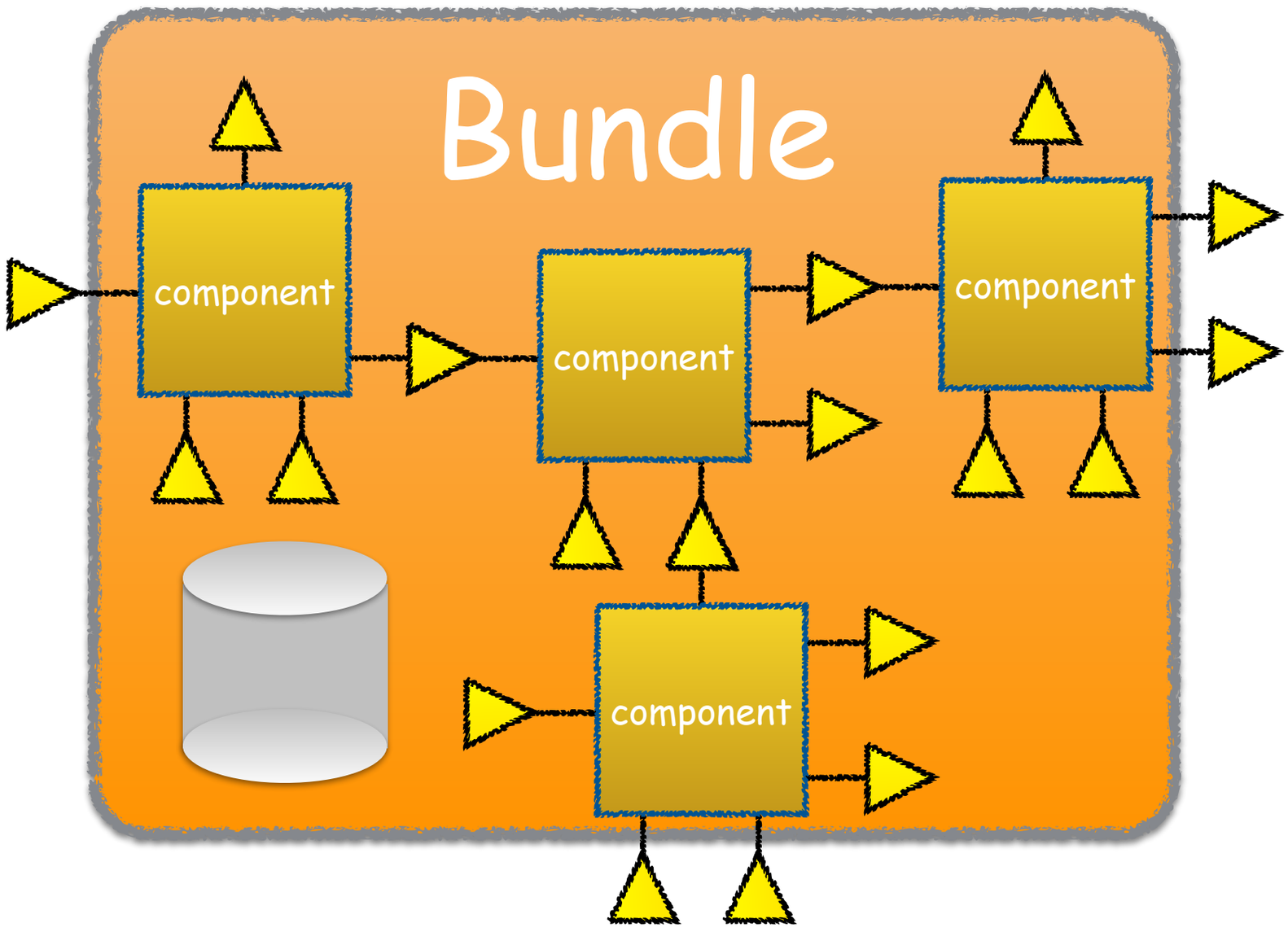
Service dependency

Problems | Javadoc | Imports/Exports | Console | Terminal

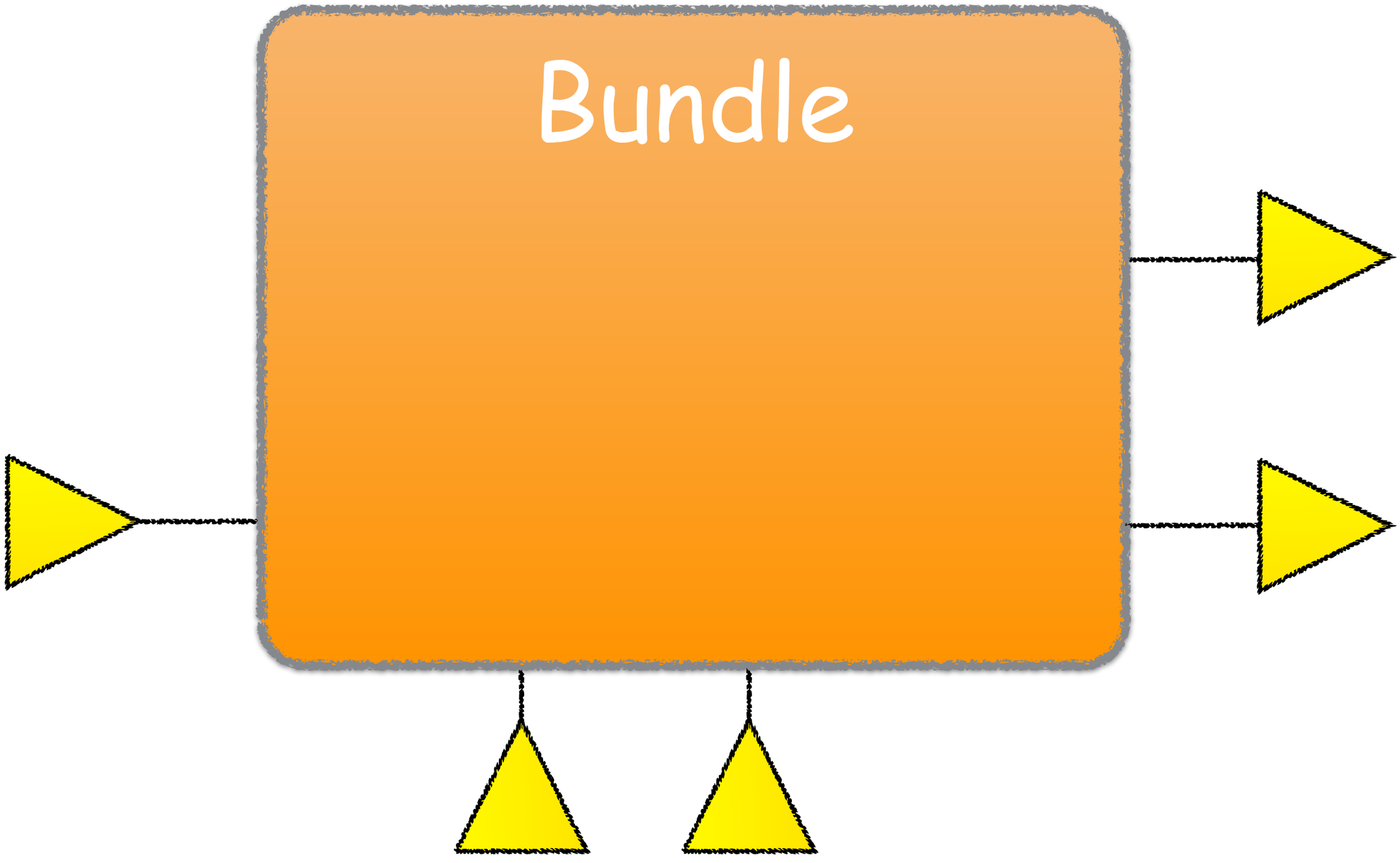
No consoles to display at this time.

Writable | Smart Insert | 20 : 20

Bundles



Bundles



Bndtools – com.acme.foo.database/provider.bnd – Eclipse – /Ws/metadata/temp

Package Exp | Type Hierarc

- src
  - com.acme.foo.database.api [1.0.0
  - com.acme.foo.database.commanc
    - DatabaseCommand.java
  - com.acme.foo.database.provider
    - DatabaseImpl.java
- test
- JRE System Library [Java SE 8 [1.8.0]]
- Bnd Bundle Path
  - osgi.enroute.base.api-1.0.0.2014
  - biz.aQute.junit-1.3.0.jar – cnf/ca
- generated
  - buildfiles
  - com.acme.foo.database.api.jar
  - com.acme.foo.database.commanc
  - com.acme.foo.database.provider.
- api.bnd
- bnd.bnd
- com.acme.foo.database.bndrun
- command.bnd
- debug.bndrun
- provider.bnd
- readme.md

Repositories

Enter search string

- Workspace temp
- Local
- Central
- Release

com.acme.foo.database.command.jar | com.acme.foo.database.provider

Bundle Content

Basic Information

Version:

Activator:

Declarative Services: None/Undefined

Private Packages

com.acme.foo.database.provider

Export Packages

com.acme.foo.database.api

Up Down

Calculated Imports

org.slf4j [1.7,2)

Customise Imports

Contents | Description | Tests | Source

Problems | Javadoc | Imports/Exports | Console

consoles to display at this time.

Private packages

Calculated imports

Exported packages

bnd descriptor

Bndtools – com.acme.foo.database/generated/com.acme.foo.database.command.jar – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package Exp | Type Hierarc

- cnf
- com.acme.foo.database
  - src
    - com.acme.foo.database.api [1.0.0
    - com.acme.foo.database.commanc
      - DatabaseCommand.java
    - com.acme.foo.database.provider
      - DatabaseImpl.java
  - test
  - JRE System Library [Java SE 8 [1.8.0]]
  - Bnd Bundle Path
    - osgi.enroute.base.api-1.0.0.2014
    - biz.aQute.junit-1.3.0.jar – cnf/ca
  - generated
    - buildfiles
    - com.acme.foo.database.api.jar
    - com.acme.foo.database.commanc
    - com.acme.foo.database.provi
  - api.bnd
  - bnd.bnd
  - com.acme.foo.database.bndrun
  - command.bnd
  - debug.bndrun

Repositories

Enter search string

- Workspace temp
- Local
- Central
- Release

com.acme.foo.database | DatabaseImpl.java | DatabaseCommand.java | com.acme.foo.database.co

```
                                        java.lang
                                        java.util
                                        org.slf4j

[USEDBY]
com.acme.foo.database.api               com.acme.foo.database.command
java.lang                               com.acme.foo.database.command
java.util                               com.acme.foo.database.command
org.slf4j                               com.acme.foo.database.command

[COMPONENTS]
OSGI-INF/com.acme.foo.database.command.DatabaseCommand.xml
<?xml version="1.0"?>

<scr:component xmlns:scr="http://www.osgi.org/xmlns/scr/v1.1.0" name="com.acme.foo.database.command.Databas
  <implementation class="com.acme.foo.database.command.DatabaseCommand"/>
  <reference name="Database" interface="com.acme.foo.database.api.Database" bind="setDatabase"/>
</scr:component>

[LIST]

  readme.md
META-INF
  MANIFEST.MF extra='\uFFFD\uFFFD\u0000\u0000'
OSGI-IN
  com.acme..  database.command.DatabaseCommand.xml
OSGI-OPT
OSGI-OPT/src
OSGI-OPT/src/com
OSGI-OPT/src/com/acme
```

Content | Print

Problems | Javadoc | Imports/Expo

No consoles to display at this time.

Content, e.g. Component XML

Continuous build JARs

external dependencies

(or where the heck is maven central????)

Bndtools – com.acme.foo.database/bnd.bnd – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package E | Type Hiera

- cnf
- com.acme.foo.database
  - src
    - com.acme.foo.database.api [1.0.0
      - Database.java
      - package-info.java
    - com.acme.foo.database.commanc
    - com.acme.foo.database.provider
  - test
  - JRE System Library [Java SE 8 [1.8.0]]
  - Bnd Bundle Path
  - generated
  - api.bnd
  - bnd.bnd
  - com.acme.foo.database.bndrun
  - command.bnd
  - debug.bndrun
  - provider.bnd
  - readme.md

com.acme.foo.database

Project Build

3 warnings detected

Sub-bundles

If sub-bundles are enabled, then .bnd files other than "bnd.bnd" will be built as bundles.

☑ Enable sub-bundles

Build Path

The selected bundles will be added to the project build path for compilation.

- osgi.enroute.base.api 1.0
- biz.aQute.junit

Build Operations

Rebuild Project

Clean Project

Build | Run | Source

Problems | Javadoc | Imports/Exp

No consoles to display at this ti

Repositories

Enter search string

- Workspace temp
- Local
- Central
  - aQute.xray.plugin
  - biz.aQute.bnd.annotation
  - biz.aQute.bndlib
  - org.apache.common[illegible]eupload
  - org.apache.commons.io
  - org.apache.felix.configadmin
  - org.apache.felix.eventadmin

Repository
(includes maven central)

Bndtools – com.acme.foo.database/bnd.bnd – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package E | Type Hiera

- cnf
- com.acme.foo.database
  - src
    - com.acme.foo.da…
      - Database…
      - package-…
    - com.acme.f…
      - Database…
    - com.acme.fo…
  - test
  - JRE System Library [Java SE 8 [1.8.0]]
  - Bnd Bundle Path
  - generated
  - api.bnd
  - bnd.bnd
  - com.acme.foo.database.bndrun
  - command.bnd
  - debug.bndrun
  - provider.bnd
  - readme.md

com.acme.foo.database

Project Build 3 warnings

Sub-bundles | Buil…

If sub-bundles are…

The selected bundles will be added to the project build path for compilation.

- osgi.enroute.base.a…
- biz.aQute.junit

Build | Run | Source

JPM

jpm4j Install Develop Browse

Login

Search Repository

ibm

Name	Versions
com.ibm.icu : icu4j *ICU4J* — ICU is a mature, widely used set of C/C++ and Java libraries providing Unicode and Globalization support for software applications. ICU is widely portable and gives applications the same results on all platforms and between C/C++ and Java software. Developed by [IBM Corporation](http://site.icu-project.org) Since 2001 Source Control scm:svn:http://source.icu-project.org/repos/icu/icu4j/tr	53.1.0 | 52
wsdl4j : wsdl4j *WSDL4J* — The IBM reference implementation of JSR-110 (Java APIs for WSDL), Web Services Description Language for Java Toolkit (WSDL4J) allows the creation, representation, and manipulation of WSDL documents. Developed by [IBM](undefined) Source Control scm:cvs:pserver:anonymous@wsdl4j.cvs.sourceforge.net:/cvsroot/wsdl4j (Users/Contributors)	1.6.3 | 1.6…

Repositories

ibm

- Workspace temp
- Local
- Central
  - Continue Search on JPM4J.org…
- Release

Problems | Javadoc | Imports/Exports | Console | Terminal

No co… display at this time.

Opens browser window

Search repos

Bndtools – com.acme.foo.database/bnd.bnd – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package E | Type Hiera

- cnf
- com.acme.foo.database
  - src
    - com.acme.foo.database.api [1.0.0
      - Database.java
      - package-info.java
    - com.acme.foo.database.commanc
      - DatabaseCommand.java
    - com.acme.foo.database.provider
  - test
  - JRE System Library [Java SE 8 [1.8.0]]
  - Bnd Bundle Path
  - generated
  - api.bnd
  - bnd.bnd
  - com.acme.foo.database.bndrun
  - command.bnd
  - debug.bndrun
  - provider.bnd
  - readme.md

*com.acme.foo.database

Project Build 3 warnings

Sub-bundles

If sub-bundles are enabled, then .bnd files other than "bnd.bnd" will be built as bundles.

☑ Enable sub-bundles

Build Path

The selected bundles will be added to the project build path for compilation.

- osgi.enroute.base.a
- biz.aQute.junit
- com.ibm.icu 53.1.0

Build | Run | Source

JPM

jpm4j Install Develop Browse

Login

Search Repository

ibm

Name	Versions
com.ibm.icu : icu4j *ICU4J* — ICU is a mature, widely used set of C/C++ and Java libraries providing Unicode and Globalization support for software applications. ICU is widely portable and gives applications the same results on all platforms and between C/C++ and Java software. Developed by [IBM Corporation](http://site.icu-project.org) Since 2001 Source Control scm:svn:http://source.icu-project.org/repos/icu/icu4j/tr	53.1.0 52
wsdl4j : wsdl4j *WSDL4J* — The IBM reference implementation of JSR-110 (Java APIs for WSDL), Web Services Description Language for Java Toolkit (WSDL4J) allows the creation, representation, and manipulation of WSDL documents. Developed by [IBM](undefined) Source Control scm:cvs:pserver:anonymous@wsdl4j.cvs.sourceforge.net:/cvsroot/wsdl4j (Users/Contributors)	1.6.3 1.6

Repositories

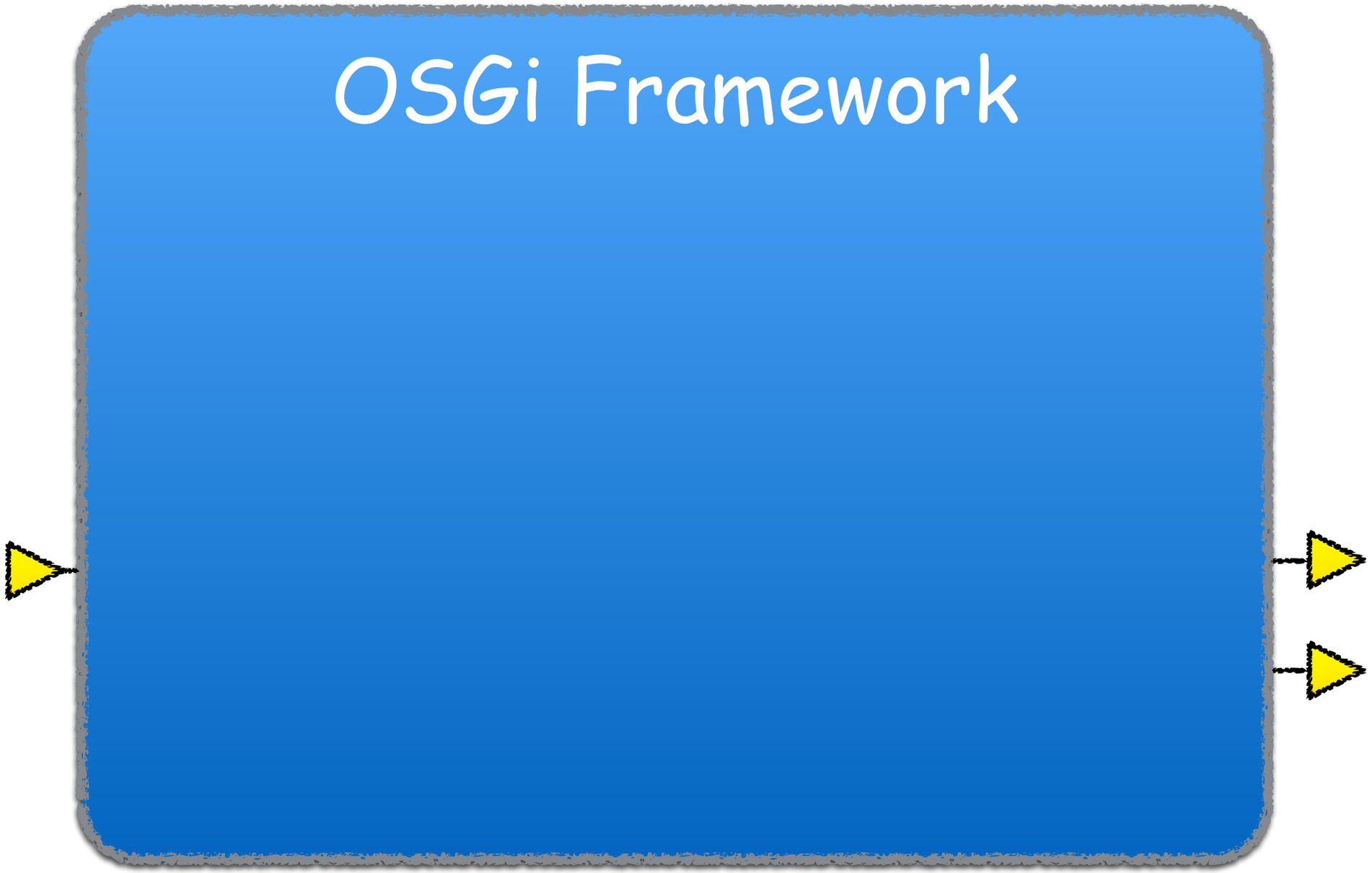
ibm

- Workspace temp
- Local
- Central
  - com.ibm.icu
  - Continue Search on JPM4J.org...
- Release

Problems | Javadoc | Imports/Exports | Console | Terminal

No consoles to display at this time.

Assemble



distros

Distros

- A distro provides the runtime environment for one or more profiles

- The OSGi enRoute project will deliver a reference distribution for all profiles based on open source and OSGi provided bundles

- Members and other companies can provide other, competing, interoperable, distributions (And are actively encouraged to do so).

how do we prevent vendor lock-in?

Capability Model

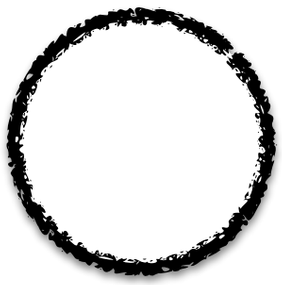
Requirement **namespace** **Capability**

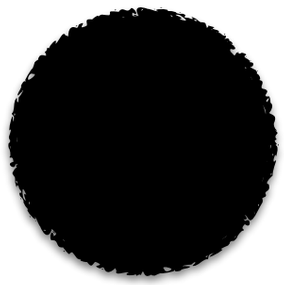
(foo>=14)

foo =14
base=“bar”
id =21

Capability Model

Import **osgi.wiring.package** **Export**





```
(&
    (osgi.wiring.package=com.acme)
    (version>=1.2)
)
```

```
osgi.wiring.package=com.acme
version=1.2
```

Bndtools – com.acme.foo.database/com.acme.foo.database.bndrun – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package Exp | Type Hierarc

com.acme.foo.database.command.jar | com.acme.foo.database.provider | com.acme.foo.database

Run

Run OSGi | Debug OSGi | Export

Debug

Resolve

Resolution Results

The required resources will be used to create the Run Bundles list. NOTE: The existing content of Run Bund
be replaced!

Required Resources

- biz.aQute.bnd.annotation 2.3.0.20140411-120027 [/Users/aqute/.bnd/shacache/shas/DD5651C2589DD2A360DBC91DC2416E87C12
- com.acme.foo.database.command 1.0.0.201406111038 [file:/Ws/metadata/temp/com.acme.foo.database/generated/com.acme.foo.da
- com.acme.foo.database.provider 1.0.0.201406111038 [file:/Ws/metadata/temp/com.acme.foo.database/generated/com.acme.foo.data
- org.apache.felix.configadmin 1.8.0 [/Users/aqute/.bnd/shacache/shas/A3D2427029DABC22F29DD4CFF508481621F2C94D/org.apach
- org.apache.felix.scr 1.8.2 [/Users/aqute/.bnd/shacache/shas/C3047D56EE57DE0752821FD9C3894DDA664F2E37/org.apache.felix.scr
- osgi.base.provider 1.0.0.201404180900 [/Users/aqute/.bnd/shacache/shas/E7F5E3C15F848B5CB47B11D089501E0467DAE7D1/osgi.b
- osgi.logger.provider 1.0.0.201404171642 [/Users/aqute/.bnd/shacache/shas/14FF54CBF2F7981E546C5C61414CF64E50B57C6A/osgi

Optional Resources

Reasons

- osgi.wiring.package=**org.osgi.service.cm**,version1.5.0 [bundle-symbolic-name=org.apache.felix.configadmin,bundle-version=1.8.0
  - REQUIRED BY **org.apache.felix.scr** 1.8.2 [filter:=(&(osgi.wiring.package=org.osgi.service.cm)(version>=1.2.0)(!(version>=2.0.0)))]
    - osgi.wiring.package=**org.osgi.service.component**,version1.2.1 [bundle-symbolic-name=org.apache.felix.scr,bundle-version=

Cancel | Finish

src
com.acme.f
com.acme.f
Databas
com.acme.f
Databas
test
JRE System Lib
Bnd Bundle Pa
osgi.enrout
biz.aQute.j
generated
buildfiles
com.acme.f
com.acme.f
com.acme.f
api.bnd
bnd.bnd
com.acme.foo
command.bnd
debug.bndru
provider.bnd
readme.md

Repositories

Enter search string

Workspace temp
Local
Central
Release

Resolve

Bndtools – com.acme.foo.database/com.acme.foo.database.bndrun – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package Exp | Type Hierarc

- src
  - com.acme.foo.database.api [1.0.0
  - com.acme.foo.database.commanc
    - DatabaseCommand.java
  - com.acme.foo.database.provider
    - DatabaseImpl.java
- test
- JRE System Library [Java SE 8 [1.8.0]]
- Bnd Bundle Path
  - osgi.enroute.base.api-1.0.0.2014
  - biz.aQute.junit-1.3.0.jar – cnf/ca
- generated
  - fw
  - buildfiles
  - com.acme.foo.database.api.jar
  - com.acme.foo.database.bndrun.r
  - com.acme.foo.database.commanc
  - com.acme.foo.database.provider.
  - launch8167337594429961289.p
- api.bnd
- bnd.bnd
- com.acme.foo.database.bndrun
- command.bnd

Repositories

Enter search string

- Workspace temp
- Local
- Central
- Release

com.acme.foo.database.command.jar | com.acme.foo.database.provider | com.acme.foo.database

```
1  #
2  #   LAUNCH SPECIFICATION
3  #
4
5
6  Bundle-Version:              1.0.0.${tstamp}
7  Bundle-SymbolicName:         com.acme.foo.database.launch
8  JPMCommand:                  databas
9
10
11 -runrequires:  \
12     osgi.identity;filter:='(osgi.identity=com.acme.foo
13     osgi.identity;filter:='(osgi.identity=com.acme.fo
14 -runbundles:  \
15     biz.aQute.bnd.annotation;version='[2.3.0,2.3.1)',\
16     com.acme.foo.database.command;version=latest,\
17     com.acme.foo.database.provider;version=latest,\
18     org.apache.felix.configadmin;version='[1.8.0,1.8.1)',\
19     org.apache.felix.scr;version='[1.8.2,1.8.3)',\
20     osgi.base.provider;version='[1.0.0,1.0.1)',\
21     osgi.logger.provider;version='[1.0.0,1.0.1)'
```

Resolved bundles

Running

Run | Source

Problems | Javadoc | Imports/Exports | Console | Terminal

com.acme.foo.database.bndrun [OSGi Framework] /Library/Java/JavaVirtualMachines/jdk1.8.0.jdk/Contents/Home/bin/java (11 jun. 2014 0

```
0    ACTIV <>              System Bundle
1    ACTIV 201430118042    reference:file:/Users/aqute/.bnd/shacache/shas/DD5651C2589DD2A360DBC91DC2416E87C1
2    ACTIV 201450116038    reference:file:/Ws/metadata/temp/com.acme.foo.database/generated/com.acme.foo.data
3    ACTIV 201450116038    reference:file:/Ws/metadata/temp/com.acme.foo.database/generated/com.acme.foo.data
4    ACTIV 201380251021    reference:file:/Users/aqute/.bnd/shacache/shas/A3D2427029DABC22F29DD4CFF508481621F
5    ACTIV 201400172251    reference:file:/Users/aqute/.bnd/shacache/shas/C3047D56EE57DE0752821FD9C3894DDA664
6    ACTIV 201430185020    reference:file:/Users/aqute/.bnd/shacache/shas/E7F5E3C15F848B5CB47B11D089501E0467D
7    ACTIV 201430171243    reference:file:/Users/aqute/.bnd/shacache/shas/14FF54CBF2F7981E546C5C61414CF64E50E
```

Bndtools – com.acme.foo.database/debug.bndrun – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package Exp | Type Hierarc | com.acme.foo.database.comma | com.acme.foo.database.provide | com.acme.foo.database | debug

OSGi | Export

Resolve

Resolve

Resolution Results

The required resources will be used to create the Run Bundles list. NOTE: The existing content of Run Bundles will be replaced!

Required Resources

- aQute.xray.plugin 1.7.0.201403241317 [/Users/aqute/.bnd/shacache/shas/55D5F5F29616F6D69B990875ACB352BE6E286C7A/aQute.xray.plugir
- biz.aQute.bnd.annotation 2.3.0.20140411-120027 [/Users/aqute/.bnd/shacache/shas/DD5651C2589DD2A360DBC91DC2416E87C12DB7CF/biz.
- com.acme.foo.database.command 1.0.0.201406111038 [file:/Ws/metadata/temp/com.acme.foo.database/generated/com.acme.foo.database.com
- com.acme.foo.database.provider 1.0.0.201406111038 [file:/Ws/metadata/temp/com.acme.foo.database/generated/com.acme.foo.database.provi
- org.apache.felix.configadmin 1.8.0 [/Users/aqute/.bnd/shacache/shas/A3D2427029DABC22F29DD4CFF508481621F2C94D/org.apache.felix.conf
- org.apache.felix.eventadmin 1.3.2 [/Users/aqute/.bnd/shacache/shas/2E6EB30259CCC3A7E2FCFEA757899781012DAB13/org.apache.felix.eventa
- org.apache.felix.gogo.command 0.12.0 [/Users/aqute/.bnd/shacache/shas/4D7FBB5A56B37C5EA63D05577742CF2941B7C648/org.apache.felix.g
- org.apache.felix.gogo.runtime 0.12.0 [/Users/aqute/.bnd/shacache/shas/C7D5749671B313CC9881FE6D7BAFDA8CFEBC83FA/org.apache.felix.go
- org.apache.felix.gogo.shell 0.10.0 [/Users/aqute/.bnd/shacache/shas/C119EFBA69451B2A3FD708CD775A60013CEA8445/org.apache.felix.gogo.

Optional Resources

Reasons

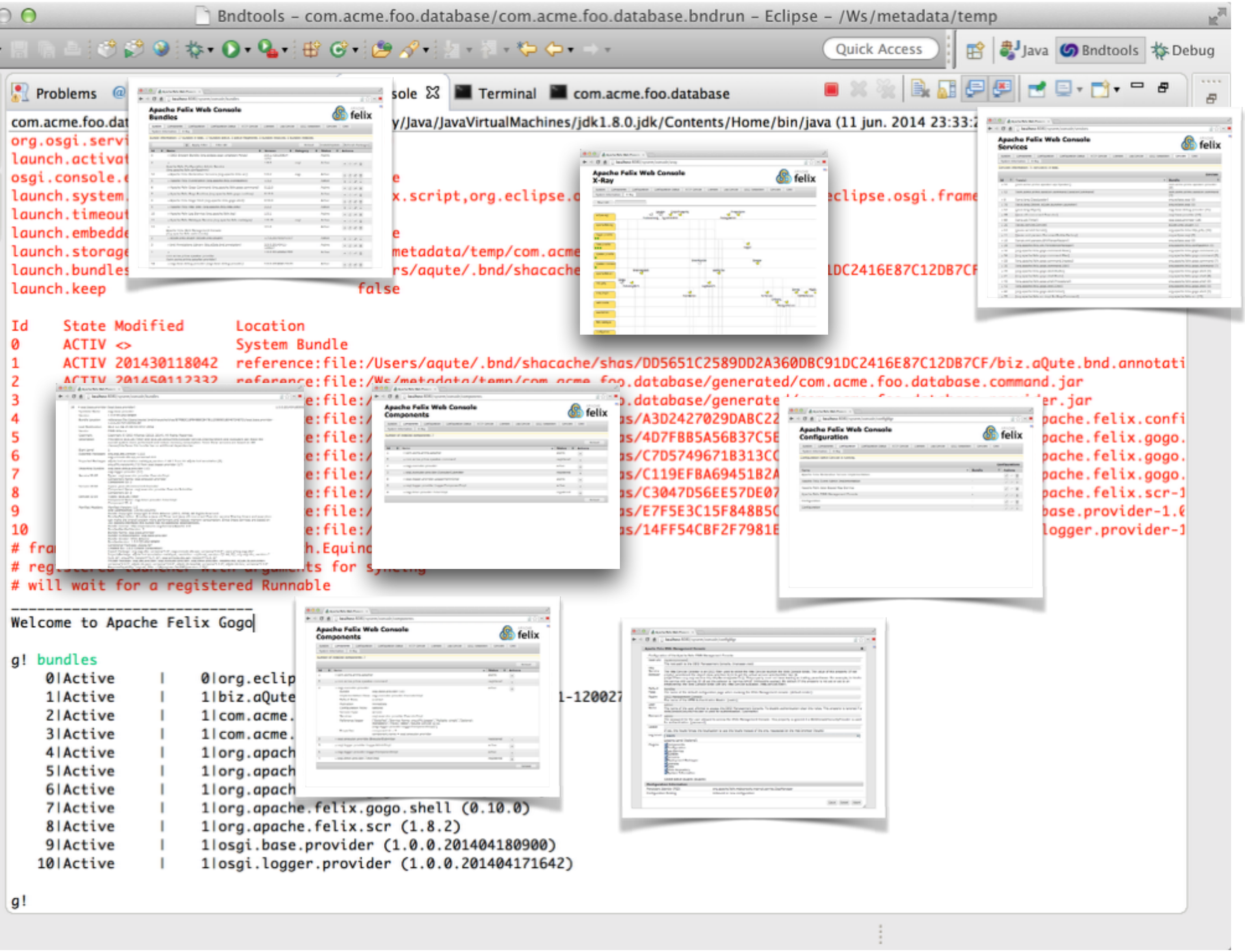
Cancel | Finish

Repositories | Workspa | Local | Central | Release

11 jun. 2014 06

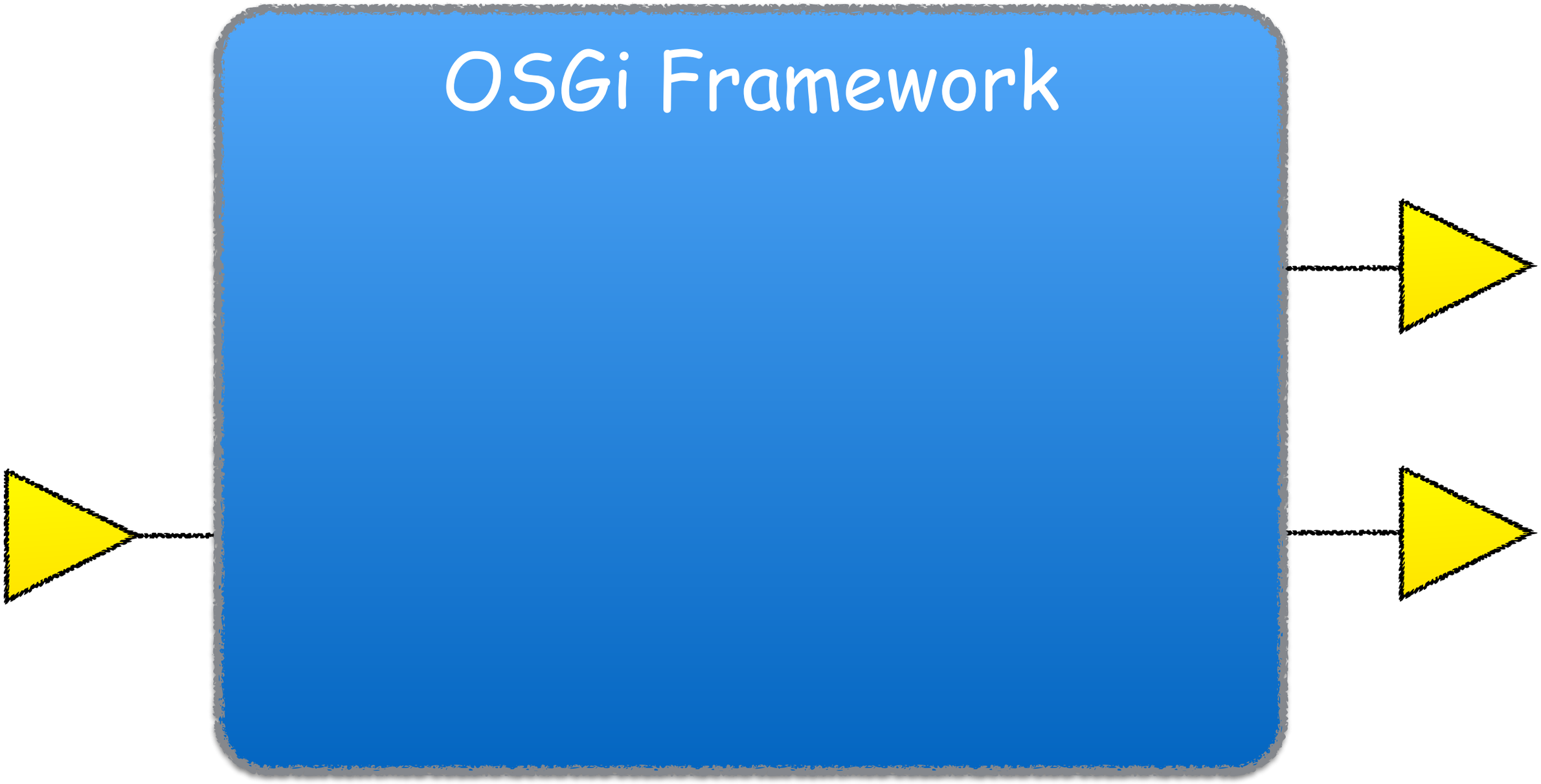
4 ACTIV 201380251021 reference:file:/Users/aqute/.bnd/shacache/shas/A3D2427029DABC22F29DD4CFF508481621F
5 ACTIV 201400172251 reference:file:/Users/aqute/.bnd/shacache/shas/C3047D56EE57DE0752821FD9C3894DDA664
6 ACTIV 201430185020 reference:file:/Users/aqute/.bnd/shacache/shas/E7F5E3C15F848B5CB47B11D089501E0467D
7 ACTIV 201430171243 reference:file:/Users/aqute/.bnd/shacache/shas/14FF54CBF2F7981E546C5C61414CF64E50E

debug.bndrun – com.acme.foo.database


Bndtools – com.acme.foo.database/com.acme.foo.database.bndrun – Eclipse – /Ws/metadata/temp
Quick Access
Java
Bndtools
Debug
Problems
Terminal
com.acme.foo.database
Apache Felix Web Console Bundles
Apache Felix Web Console X-Ray
Apache Felix Web Console Services
Apache Felix Web Console Components
Apache Felix Web Console Configuration
Apache Felix Web Console Components
Id State Modified Location
0 ACTIV <> System Bundle
1 ACTIV 201430118042 reference:file:/Users/aqute/.bnd/shacache/shas/DD5651C2589DD2A360DBC91DC2416E87C12DB7CF/biz.aQute.bnd.annotati
will wait for a registered Runnable
Welcome to Apache Felix Gogo
g! bundles
0|Active | 0|org.eclip
1|Active | 1|biz.aQute
2|Active | 1|com.acme.
3|Active | 1|com.acme.
4|Active | 1|org.apach
5|Active | 1|org.apach
6|Active | 1|org.apach
7|Active | 1|org.apache.felix.gogo.shell (0.10.0)
8|Active | 1|org.apache.felix.scr (1.8.2)
9|Active | 1|osgi.base.provider (1.0.0.201404180900)
10|Active | 1|osgi.logger.provider (1.0.0.201404171642)
g!

staging

Staging



Bndtools – com.acme.foo.database/com.acme.foo.database.bndrun – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package E | Type Hiera

- cnf
- com.acme.foo.database
  - src
    - com.acme.foo.database.api [1.0.0
      - Database.java
      - package-info.java
    - com.acme.foo.database.commanc
      - DatabaseCommand.java
    - com.acme.foo.database.provider
  - test
  - JRE System Library [Java SE 8 [1.8.0]]
  - Bnd Bundle Path
  - generated
  - api.bnd
  - bnd.bnd
  - com.acme.foo.database.bndrun
  - command.bnd
  - debug.bndrun
  - provider.bnd
  - readme.md

Repositories

ibm

- Workspace temp
- Local
- Central
  - Continue Search on JPM4J.org...
- Release

com.acme.foo.database | com.acme.foo.database

Run

Run OSGi | Debug OSGi | Export

Repository Selection

Available Bundles

Available bundles. These
Requirements list to the

Enter search string

- com.acme.foo.dat
- com.acme.foo.dat
- com.acme.foo.dat
- aQute.xray.plugin
- biz.aQute.bnd.anr
- biz.aQute.bndlib

Core Runtime

OSGi Framework:

Execution Env.:

Runtime Properties

Program Arguments

VM Arguments

Run Bundles

Resolve

Run | Source

Problems | Javadoc | Imports/Exports | Console | Terminal

No consoles to display at this time.

Export Wizard Selection

Select a wizard for exporting this Run Descriptor

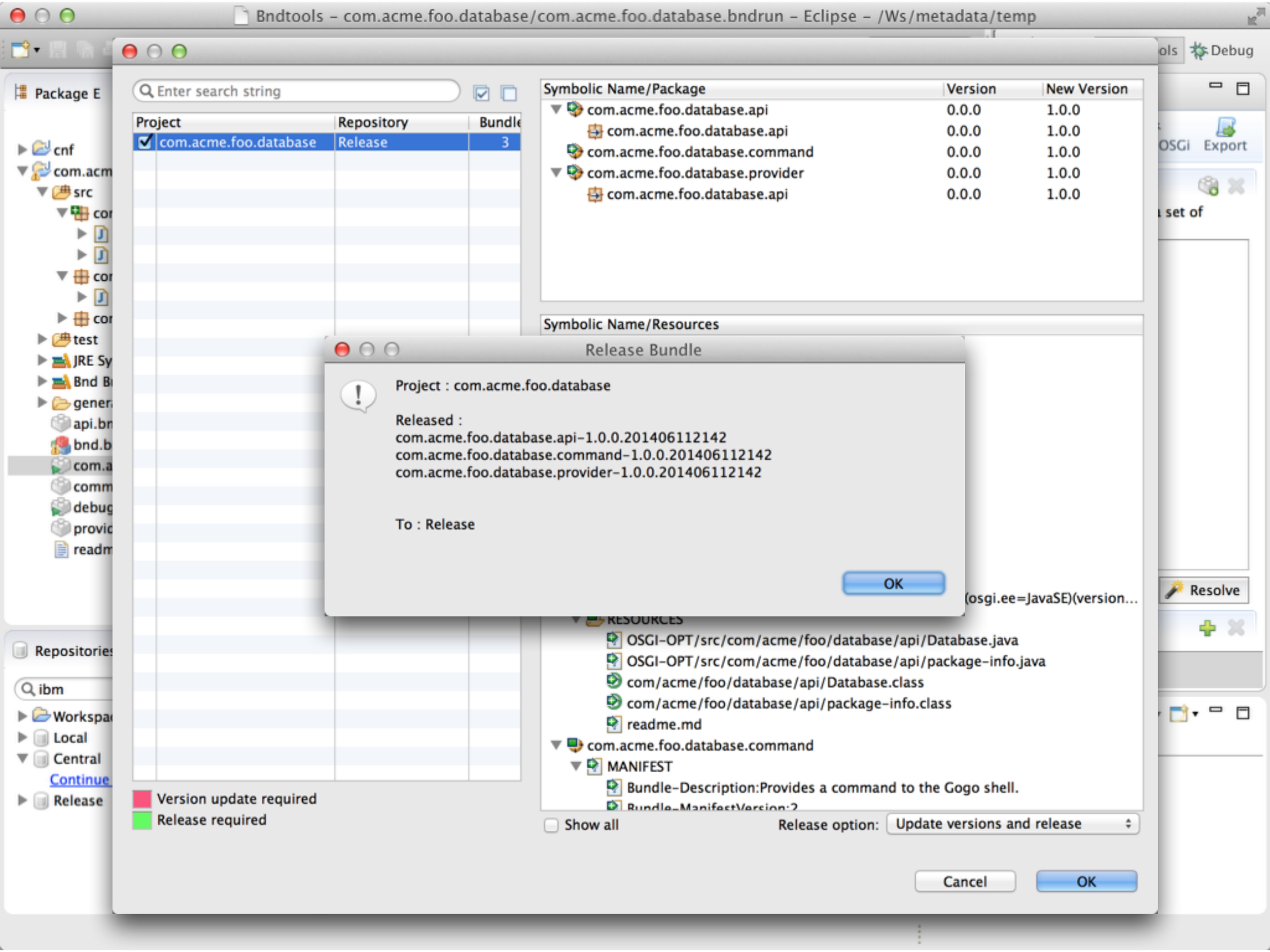
Executable JAR

< Back | Next > | Cancel | Finish

release

Semantic Versioning

- major – Breaking change for consumers
- minor – Breaking change for providers
- micro – Invisible change


Bndtools – com.acme.foo.database/com.acme.foo.database.bndrun – Eclipse – /Ws/metadata/temp
Enter search string
Project
Repository
Bundle
com.acme.foo.database
Release
3
Symbolic Name/Package
Version
New Version
com.acme.foo.database.api 0.0.0 1.0.0
com.acme.foo.database.api 0.0.0 1.0.0
com.acme.foo.database.command 0.0.0 1.0.0
com.acme.foo.database.provider 0.0.0 1.0.0
com.acme.foo.database.api 0.0.0 1.0.0
Symbolic Name/Resources
Release Bundle
Project : com.acme.foo.database
Released :
com.acme.foo.database.api-1.0.0.201406112142
com.acme.foo.database.command-1.0.0.201406112142
com.acme.foo.database.provider-1.0.0.201406112142
To : Release
OK
(osgi.ee=JavaSE)(version...
RESOURCES
OSGI-OPT/src/com/acme/foo/database/api/Database.java
OSGI-OPT/src/com/acme/foo/database/api/package-info.java
com/acme/foo/database/api/Database.class
com/acme/foo/database/api/package-info.class
readme.md
com.acme.foo.database.command
MANIFEST
Bundle-Description:Provides a command to the Gogo shell.
Version update required
Release required
Show all
Release option:
Update versions and release
Cancel
OK
Package E
cnf
com.acm
src
test
JRE Sy
Bnd B
gener
api.br
bnd.b
com.a
comm
debug
provic
readm
Repositories
ibm
Workspa
Local
Central
Continue
Release
Debug
OSGi
Export
set of
Resolve

baselining

Bndtools – com.acme.foo.database/src/com/acme/foo/database/api/Database.java – Eclipse – /Ws/metadata/temp

Quick Access | Java | Bndtools | Debug

Package E | Type Hiera

- cnf
- com.acme.foo.database
  - src
    - com.acme.foo.database.api [1.0.0
      - Database.java
      - package-info.java
      - packageinfo
    - com.acme.foo.database.commanc
      - DatabaseCommand.java
    - com.acme.foo.database.provider
  - test
  - JRE System Library [Java SE 8 [1.8.0]]
  - Bnd Bundle Path
  - generated
  - api.bnd
  - bnd.bnd
  - com.acme.foo.database.bndrun
  - command.bnd
  - debug.bndrun
  - provider.bnd
  - readme.md

com.acme.foo.database | com.acme.foo.database | Database.java

```
1  package com.acme.foo.database.api;
2
3  import org.osgi.annotation.versioning.ProviderType;
4
5  /**
6   * This is an example enroute bundle that has a component that implements a
7   * simple API.
8   */
9
10 @ProviderType
11 public interface Database {
12
13     /**
14      * The interface is a minimal method.
15      *
16      * @param message the message to say
17      * @return true if the message could be spoken
18      */
19     boolean say(String message);
20
21 }
22
```

Repositories

Enter search string

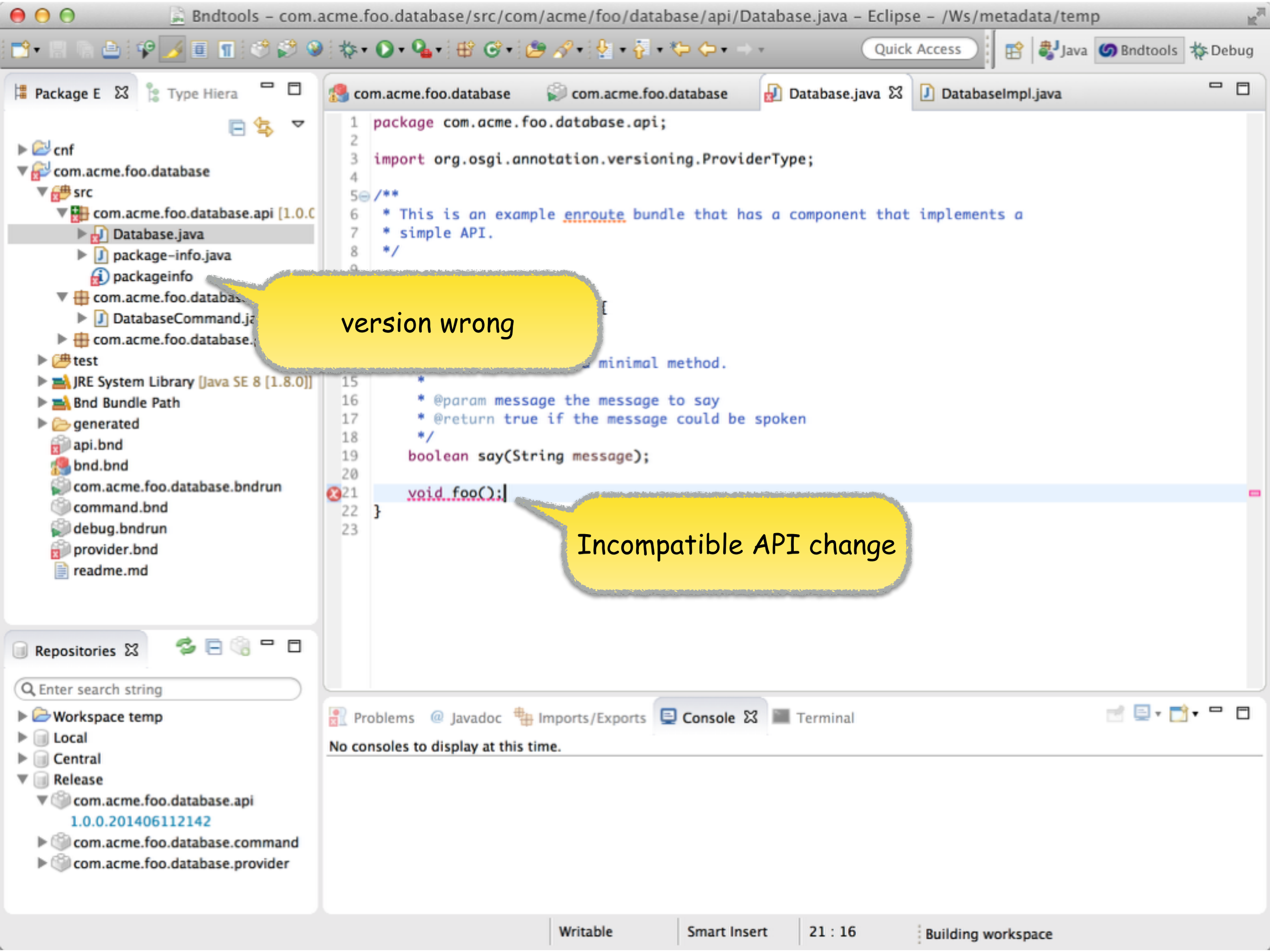
- Workspace temp
- Local
- Central
- Release
  - com.acme.foo.database.api
    - 1.0.0.201406112142
  - com.acme.foo.database.command
  - com.acme.foo.database.provider

Problems | Javadoc | Imports/Exports | Console | Terminal

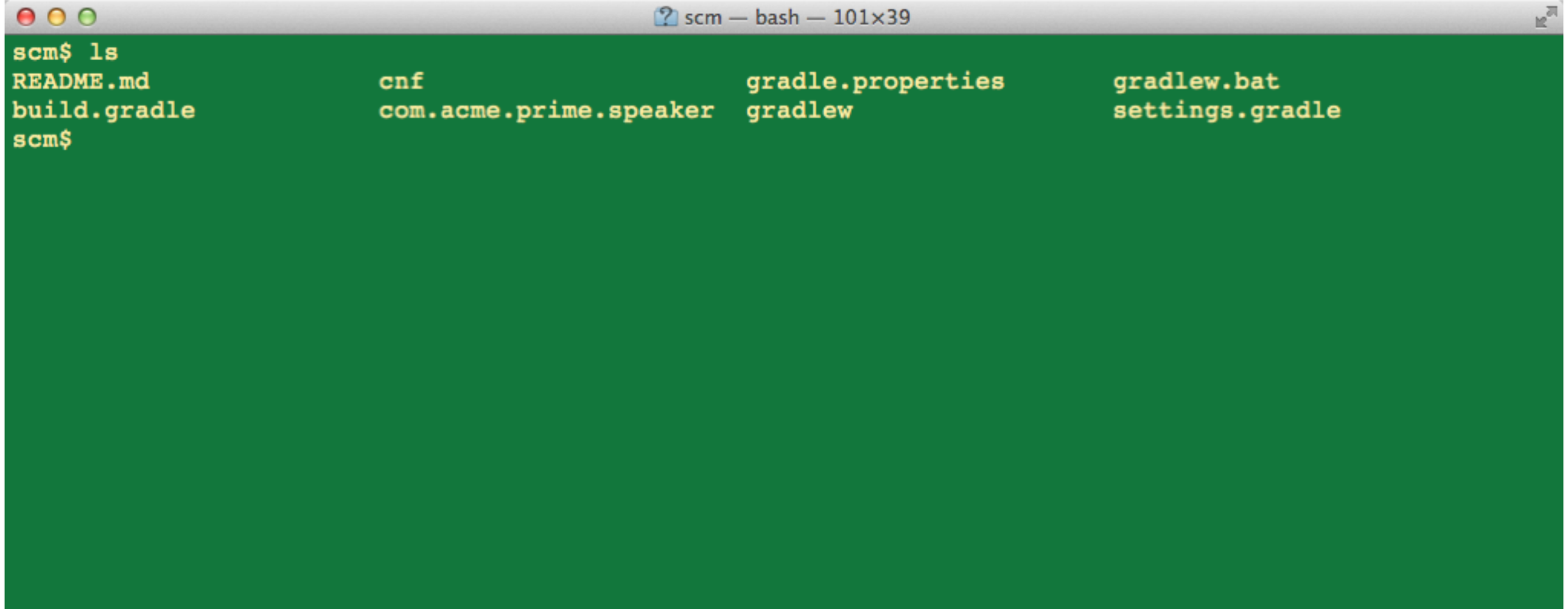
No consoles to display at this time.

Released bundles

NoSuchMethodException


Bndtools – com.acme.foo.database/src/com/acme/foo/database/api/Database.java – Eclipse – /Ws/metadata/temp
Quick Access
Java
Bndtools
Debug
Package E
Type Hiera
cnf
com.acme.foo.database
src
com.acme.foo.database.api [1.0.0
Database.java
package-info.java
packageinfo
com.acme.foo.databas
DatabaseCommand.ja
com.acme.foo.database.
test
JRE System Library [Java SE 8 [1.8.0]]
Bnd Bundle Path
generated
api.bnd
bnd.bnd
com.acme.foo.database.bndrun
command.bnd
debug.bndrun
provider.bnd
readme.md
com.acme.foo.database
com.acme.foo.database
Database.java
DatabaseImpl.java
package com.acme.foo.database.api;
import org.osgi.annotation.versioning.ProviderType;
/**
* This is an example enroute bundle that has a component that implements a
* simple API.
*/
minimal method.
*
* @param message the message to say
* @return true if the message could be spoken
*/
boolean say(String message);
void foo();
}
version wrong
Incompatible API change
Repositories
Enter search string
Workspace temp
Local
Central
Release
com.acme.foo.database.api
1.0.0.201406112142
com.acme.foo.database.command
com.acme.foo.database.provider
Problems
Javadoc
Imports/Exports
Console
Terminal
No consoles to display at this time.
Writable
Smart Insert
21 : 16
Building workspace

command line



scm — bash — 101×39

```
scm$ ls
README.md                cnf                      gradle.properties        gradlew.bat
build.gradle             com.acme.prime.speaker   gradlew                  settings.gradle
scm$
```

```
scm$ ls
README.md                com.acme.prime.speaker  gradle.properties       settings.gradle
build.gradle             gradlew                 gradlew.bat
cnf
scm$
scm$ ./gradlew release
:com.acme.prime.speaker:compileJava UP-TO-DATE
:com.acme.prime.speaker:processResources UP-TO-DATE
:com.acme.prime.speaker:classes UP-TO-DATE
:com.acme.prime.speaker:jar UP-TO-DATE
:com.acme.prime.speaker:assemble UP-TO-DATE
:com.acme.prime.speaker:release
Warning: com.acme.prime.speaker.api: Please update this Bundle-Description in com.acme.prime.speaker/
api.bnd
Warning: com.acme.prime.speaker.command: Please update this Bundle-Description in com.acme.prime.spea
ker/command.bnd
Warning: com.acme.prime.speaker.provider: Please update this Bundle-Description in com.acme.prime.spe
aker/api.bnd

BUILD SUCCESSFUL

Total time: 3.35 secs
scm$
```

continuous integration

Peter Kriens

bnd

aQute
Montpellier, France
Peter.Kriens@aqute.biz
http://www.osgi.org
Joined on Feb 09, 2010

55 Followers **9** Starred **0** Following

Organizations

Contributions | Repositories | Public activity

Popular repositories

aQute.repo 4★
A repository for binary in bnd format

maven 1★
maven 3

posthooktest 1★
Test for posthooks

repo 1★
bnd primary major repo

com.acme.prime 0★
An OSGi enRoute Tutorial CI example

Repositories contributed to

bndtools/bnd
bnd, the swiss army knife for OSGi. A to...

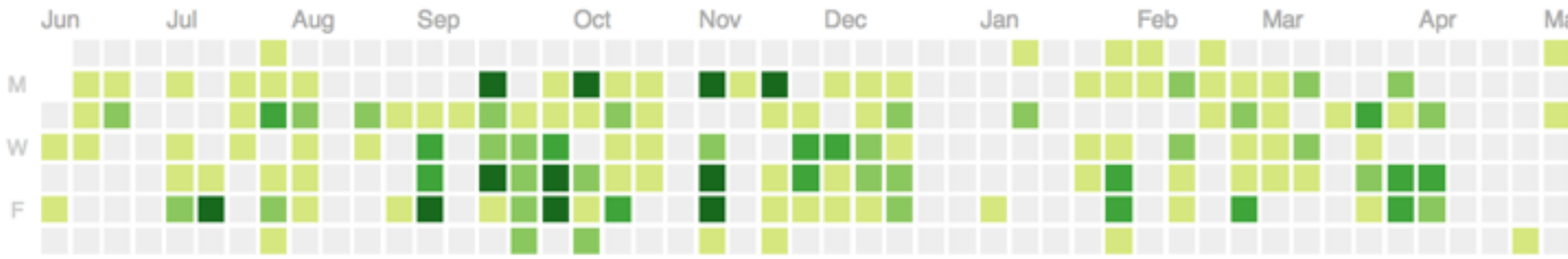
bndtools/bndtools
Eclipse tools for developing OSGi bundles

osgi/bundles
A repository with runtime bundles that wil...

osgi/osgi.enroute.template
Provides the bnd template for the enRout...

osgi/osgi.enroute
The repository that contains the docume...

Contributions



Summary of Pull Requests, issues opened, and commits. Learn more.

Less

Year of contributions | Longest streak | Current streak

Travis CI - Free Hosted Co

https://travis-ci.org/bndtools/bnd

travis | Home | Blog | Status | Help | Travis CI for Private Repositories | Peter Kriens

Search all repositories

My Repositories | Recent | +

- osgi/osgi.enroute.template 2
  - 52 sec
  - about 3 hours ago
- bndtools/bndtools 23
  - 2 min 37 sec
  - about 7 hours ago
- bndtools/bnd 78
  - 6 min 12 sec
  - a day ago
- bndtools/bindex 3
  - 1 min 20 sec
  - 2 days ago
- bnd/com.acme.prime 2
  - 1 min 12 sec
  - 4 days ago

bndtools/bnd

build passing

bnd, the swiss army knife for OSGi. A tool to build bundles.

Current | Build History | Pull Requests | Branch Summary

master - Enhanced FilterParser

#78 passed

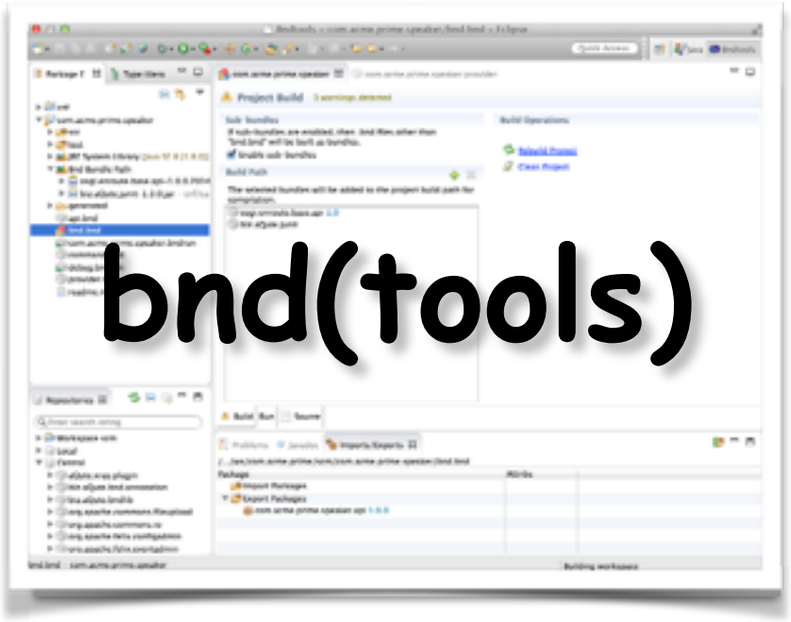
ran for 6 min 12 sec
a day ago

Neil Bartlett authored and committed

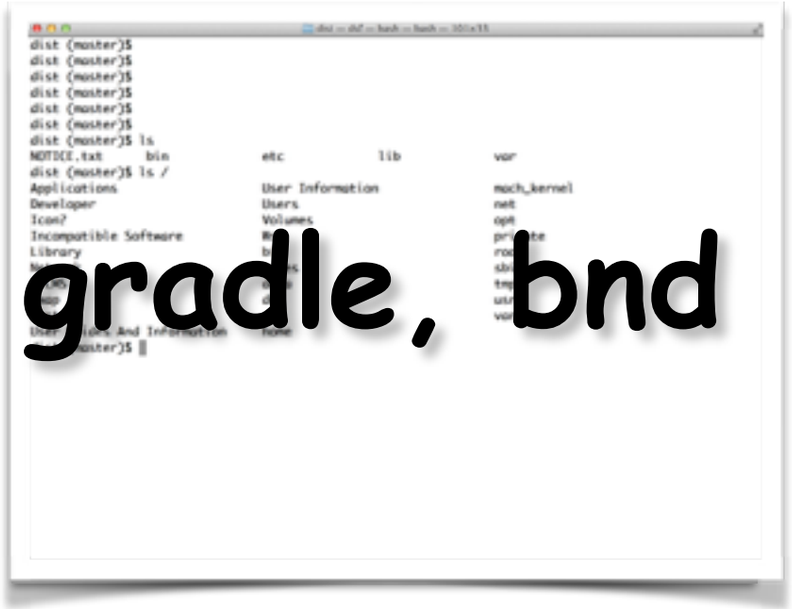
Commit 0f7cc09 Compare 7ea3fa8..0f7cc09

```
1  Using worker: worker-linux-10-1.bb.travis-ci.org:travis-linux-20
2
3  $ export TERM=dumb
4  $ git clone --depth=50 --branch=master                          git.1
12 $ cd bndtools/bnd
13 $ git checkout -qf 0f7cc098e72668d35bbfef63367ebe2b836021fe     git.3
14 $ jdk_switcher use oraclejdk7
15 Switching to Oracle JDK7 (java-7-oracle), JAVA_HOME will be set to
   /usr/lib/jvm/java-7-oracle
16 update-alternatives: error: no alternatives for apt.
17 update-alternatives: error: no alternatives for apt.
18 $ java -version
19 java version "1.7.0_51"
20 Java(TM) SE Runtime Environment (build 1.7.0_51-b13)
21 Java HotSpot(TM) 64-Bit Server VM (build 24.51-b03, mixed mode)
22 $ javac -version
```

summary



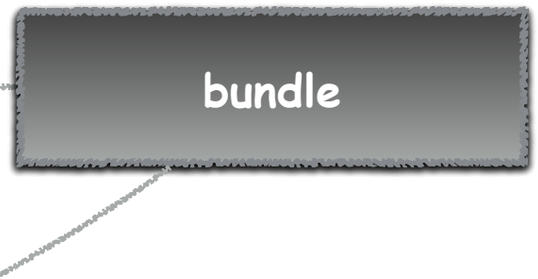
bnd(tools)



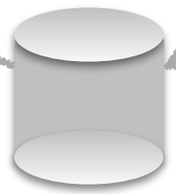
gradle, bnd

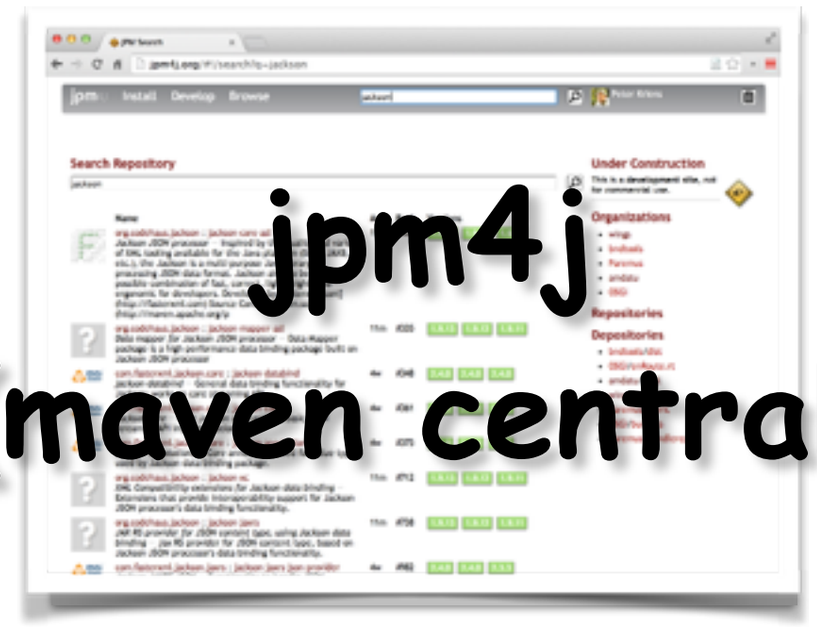
bundle

Workspace

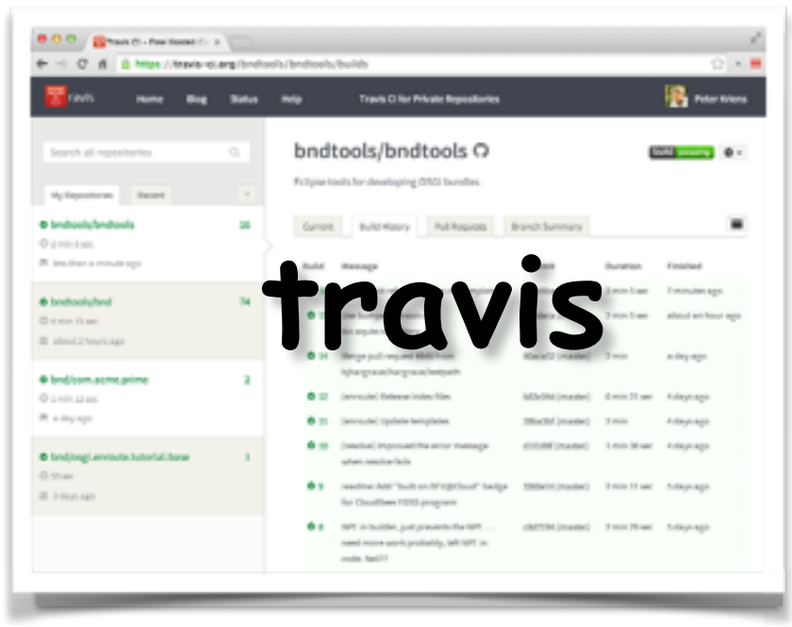


bundle





jpm4j
(maven central)



travis

// TODO

TODO

- bnd(tools) documentation
- Base Tutorial
- Additional profiles
- Additional deployment standards
- Create a community!