Tutorial

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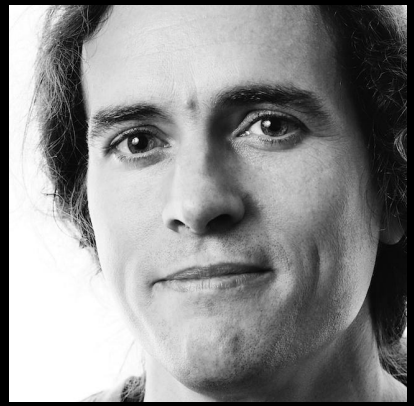
Markus Knauer

Who we are



Florian

Johannes

Markus

Introduction Round

1. Who am I?
2. What is my EclipseRT background?
3. What is my motivation to visit the tutorial?

Roadmap

1. Install Virgo Server and IDE + Tooling
2. Walkthrough greenpages
3. “Hands On”

Installing Prerequisites

1. Virgo Server for Apache Tomcat
2. Spring Tool Suite™ with Virgo Tooling

Installing Virgo (3.6.2.RELEASE)

Goto https://www.eclipse.org/virgo/download/

```
unzip virgo-tomcat-server-3.6.2.RELEASE.zip
```

USB stick:

```
/virgo-tomcat-server-3.6.2.RELEASE.zip
```

Installation of 3rd party libraries

USB stick:

```
cp /USB Stick/par-provided/*.jar ${VIRGO_HOME}/repository/usr
```

Install Eclipse and Virgo Tooling

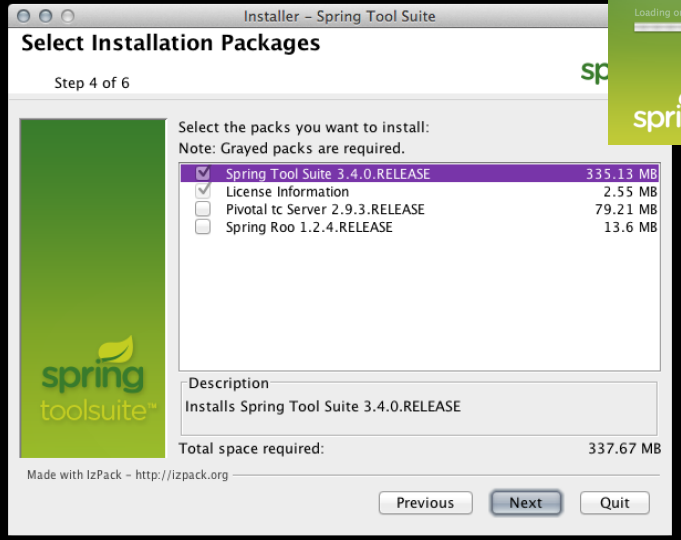
Install Eclipse

- Eclipse Kepler (4.3.2) SR2 Packages
  OR
- Spring Tool Suite™ (3.4.0.RELEASE)

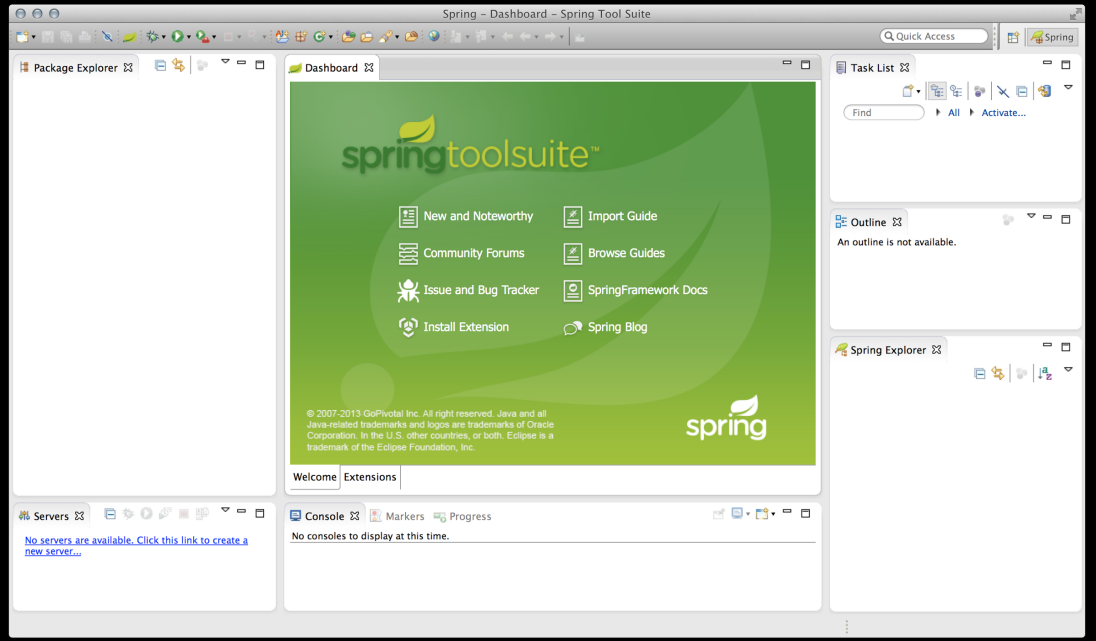
USB stick:

unzip <platform>/spring-tool-suite…

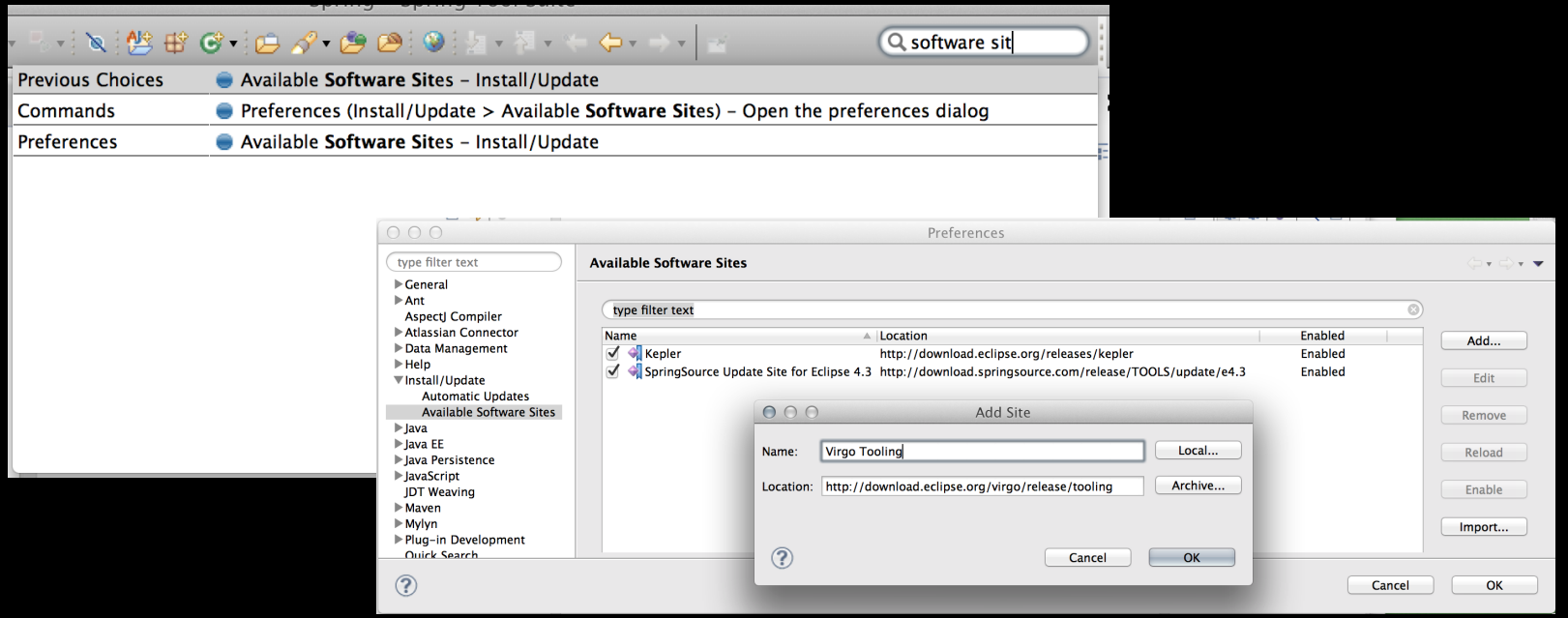
Install STS


Installer – Spring Tool Suite
Select Installation Packages
Step 4 of 6
Select the packs you want to install:
Note: Grayed packs are required.
Spring Tool Suite 3.4.0.RELEASE 335.13 MB
License Information 2.55 MB
Pivotal tc Server 2.9.3.RELEASE 79.21 MB
Spring Roo 1.2.4.RELEASE 13.6 MB
Description
Installs Spring Tool Suite 3.4.0.RELEASE
Total space required: 337.67 MB
Made with IzPack - http://izpack.org
Previous
Next
Quit


springtoolsuite
3.4.0.RELEASE
Loading org.springsource.ide.eclipse.dashboard.ui
spring

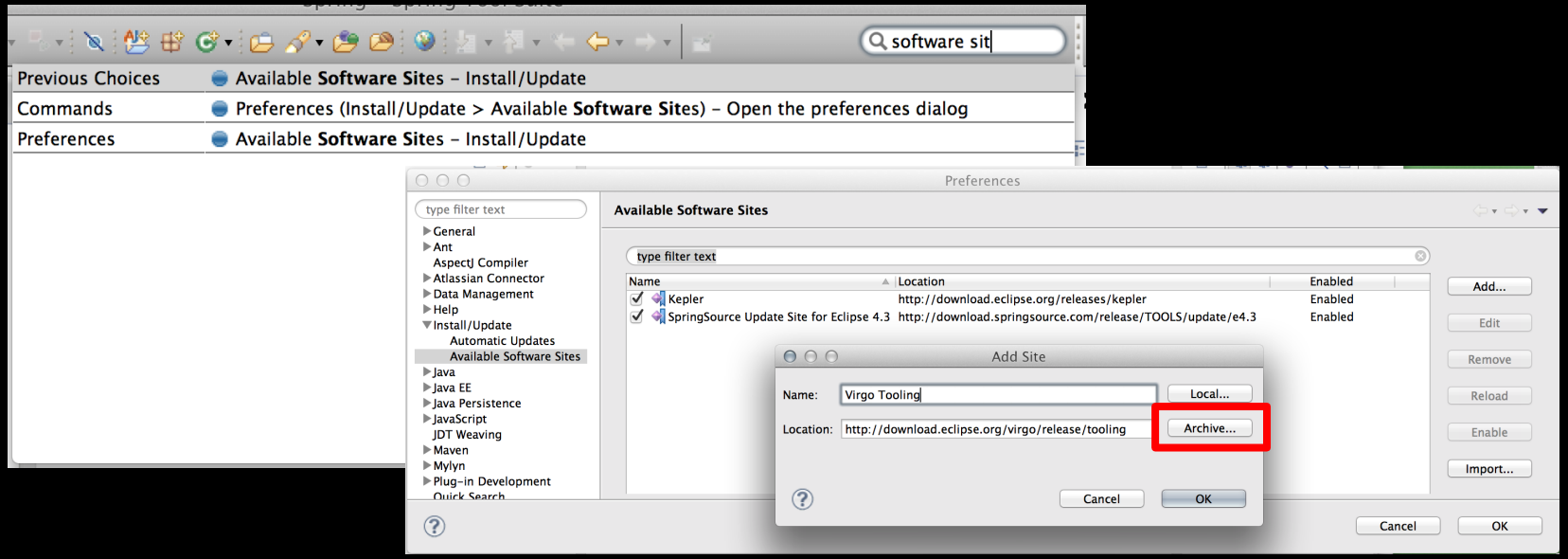

Spring – Dashboard – Spring Tool Suite
Package Explorer
Dashboard
springtoolsuite
New and Noteworthy
Import Guide
Community Forums
Browse Guides
Issue and Bug Tracker
SpringFramework Docs
Install Extension
Spring Blog
Welcome
Extensions
Task List
Outline
An outline is not available.
Spring Explorer
Servers
No servers are available. Click this link to create a new server...
Console
Markers
Progress
No consoles to display at this time.

<ctrl>+<3> software site



Update Site:
http://download.eclipse.org/virgo/release/tooling

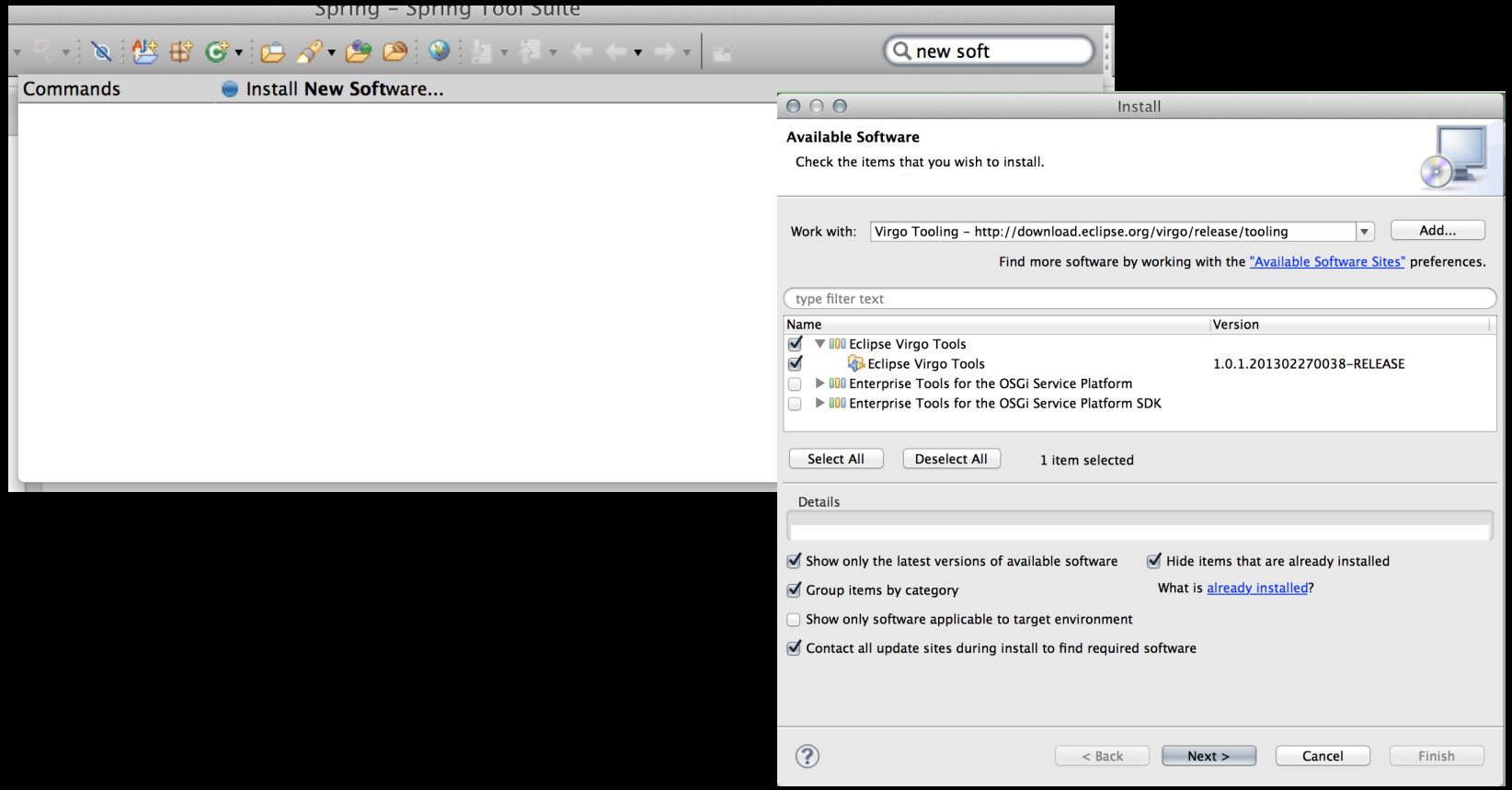
<ctrl>+<3> software site



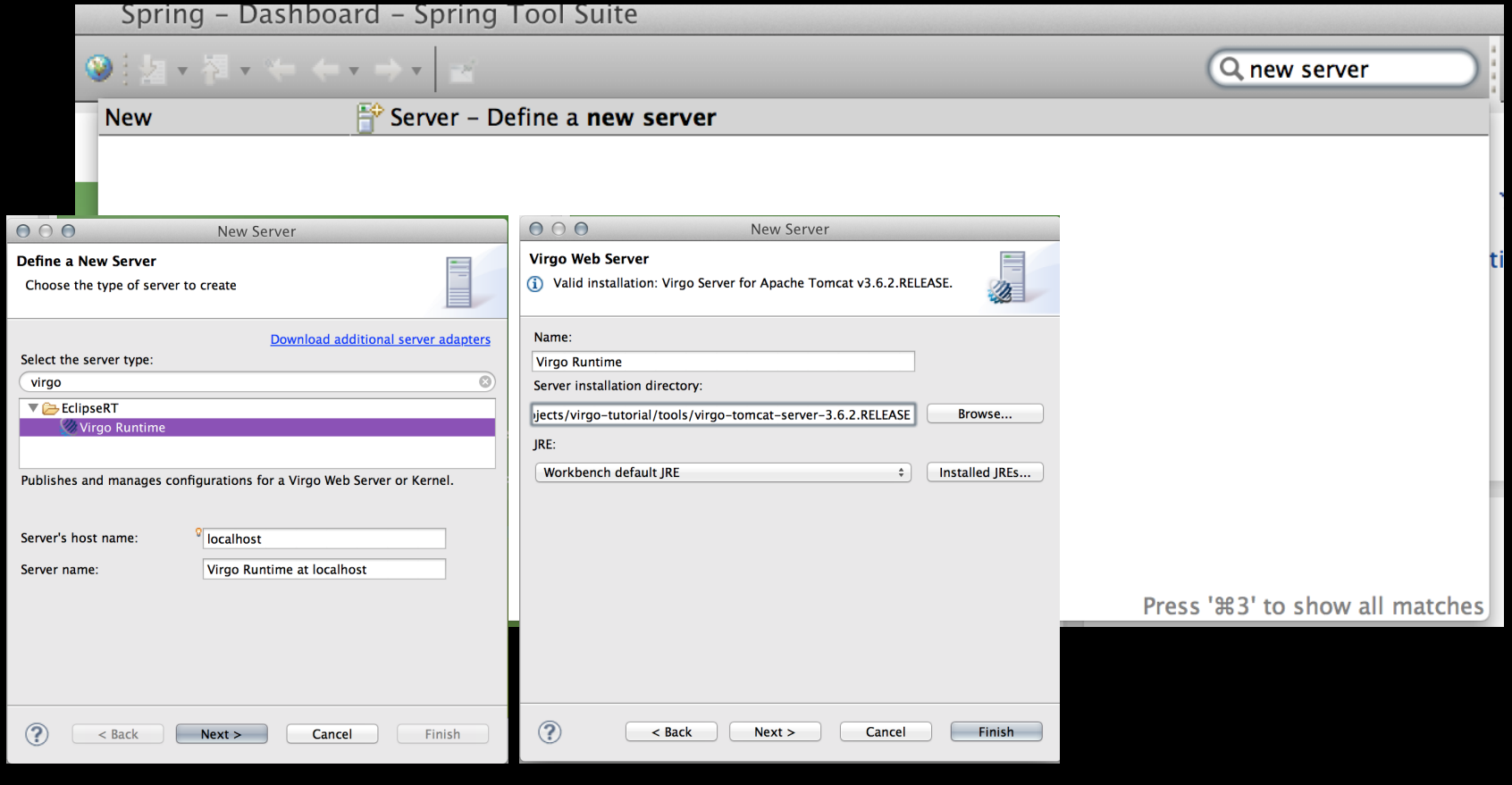
USB stick:

use `virgo.ide-1.0.1...zip`

<ctrl>+<3> new software



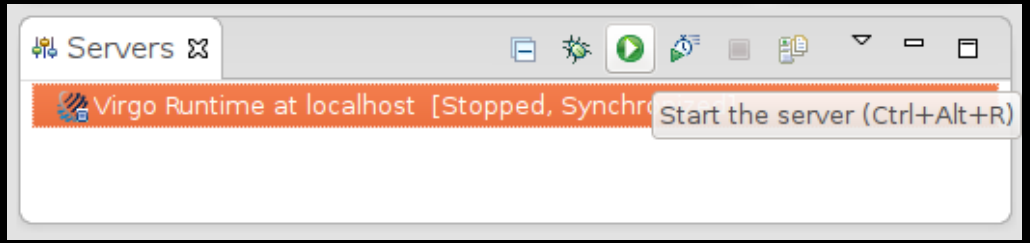
<ctrl>+<3> new server



Enable OSGi console

`${VIRGO_HOME}/repository/ext/osgi.console.properties`

```
telnet.enabled=true
telnet.port=2501
telnet.host=localhost
ssh.enabled=false
ssh.port=2502
ssh.host=localhost
```




```
$> telnet localhost 2501
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
osgi>
```

Virgo Alive

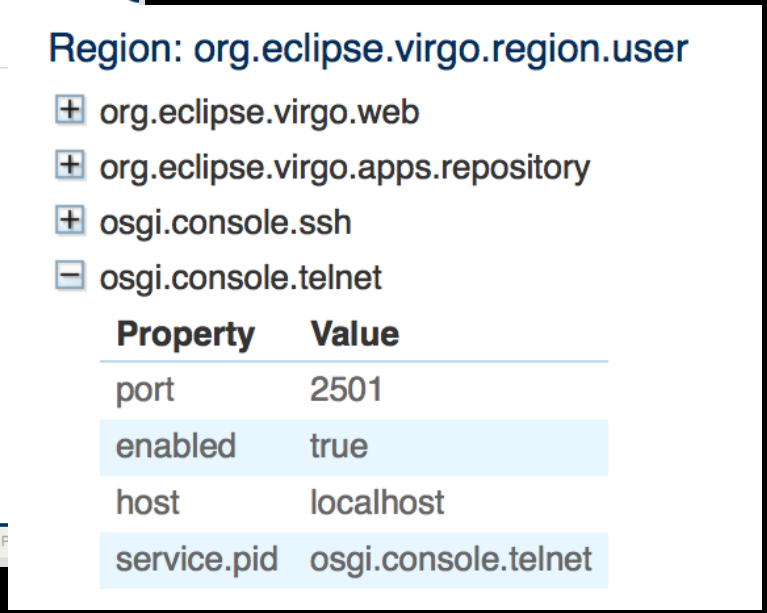
Admin Console

`localhost:8080`

Username: **admin**

Password: **springsource**

Virgo Admin Console



GreenPages Admin Console Virgo

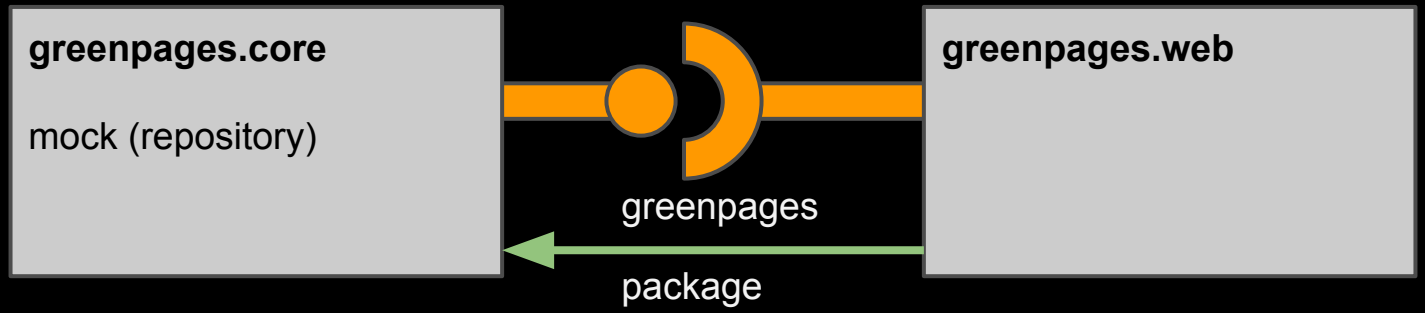
Virgo Web Server - Greenpages sample

Submit Query

Virgo demo used in official documentation

"Despite its simplicity, GreenPages is designed to demonstrate many different Virgo features and to act as a template from which other modular applications can be built."

Architectural Overview 1/2

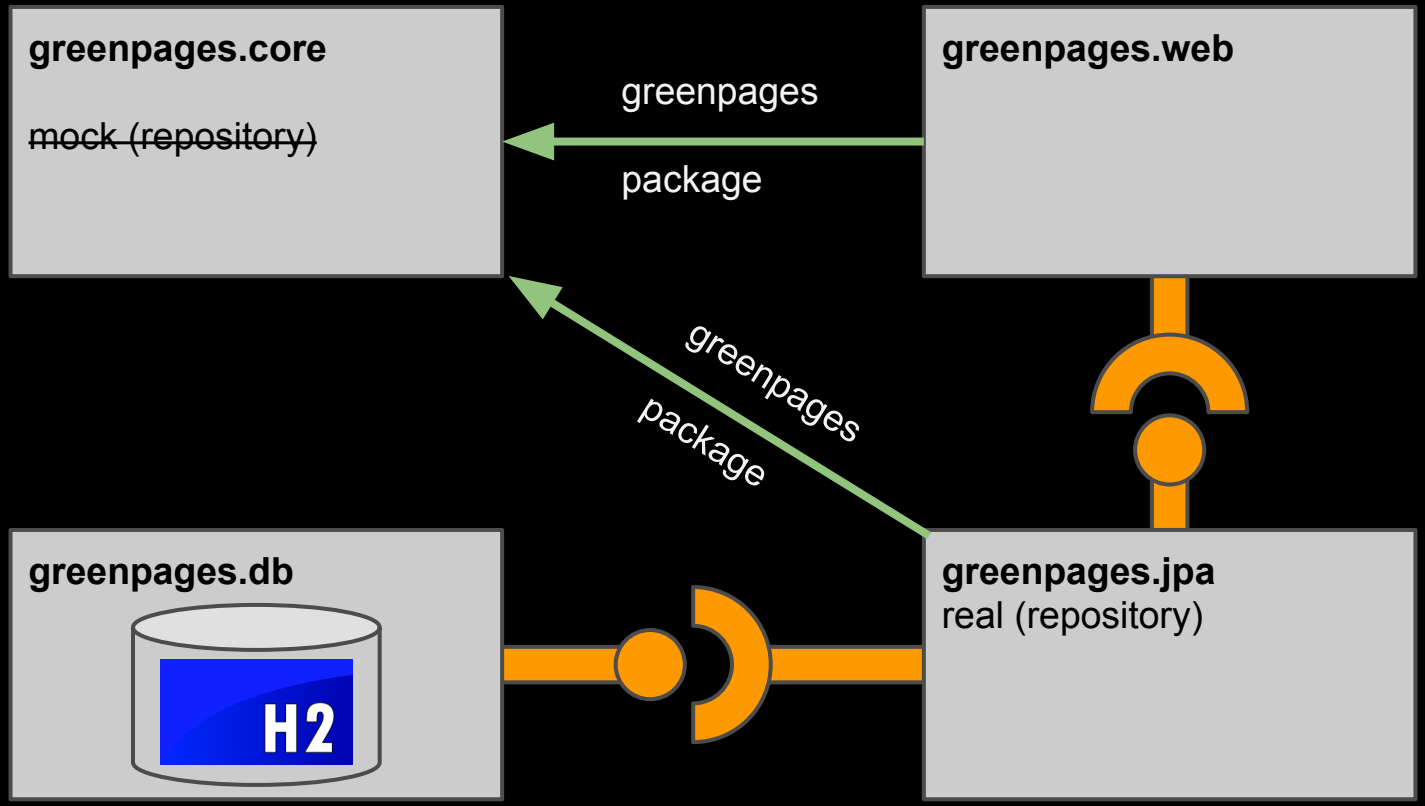


OSGi service export

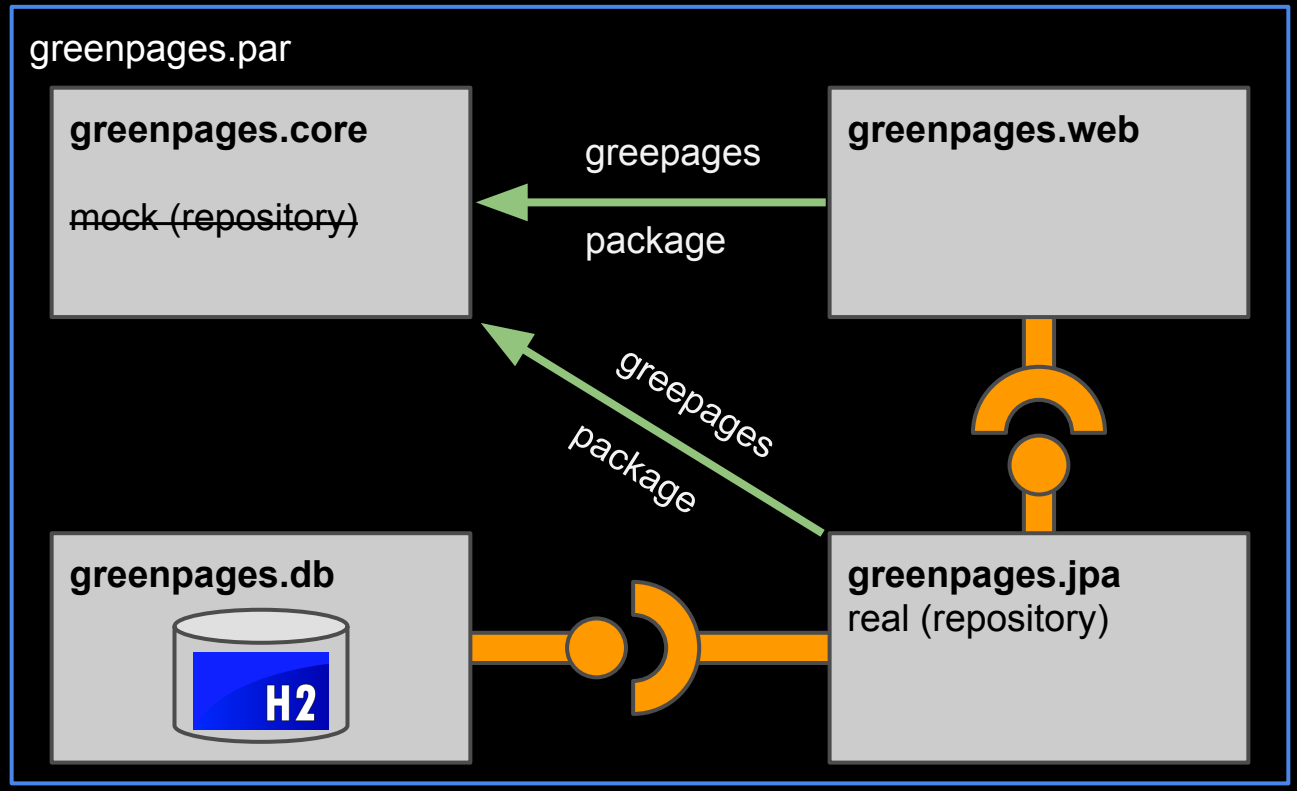
OSGi service import

package usage

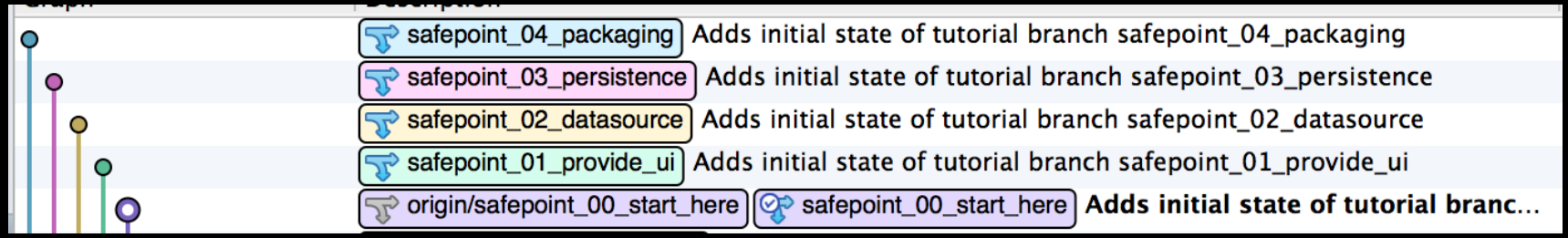
Architectural Overview 2/2



Packaging


greenpages.par
greenpages.core
~~mock (repository)~~
greepages
package
greenpages.web
greepages
package
greenpages.db
H2
greenpages.jpa
real (repository)

Tutorial as Branches



During the Tutorial YOU do:

1. Try to solve the steps (Hint: Look for TODO x.y)
2. `git diff safepoint_0x_<branch_name>`
3. `git checkout safepoint_0x_<branch_name>`

Ready, Steady, ...

Vir...Go!

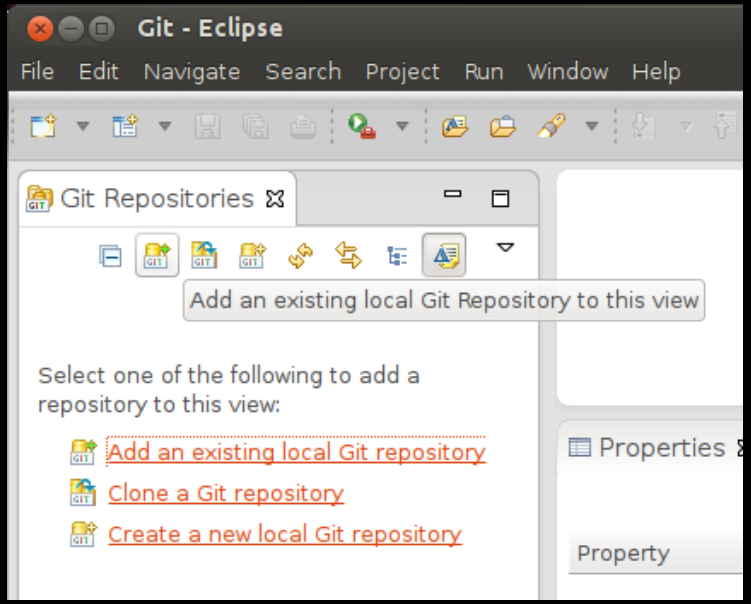
Kickstart

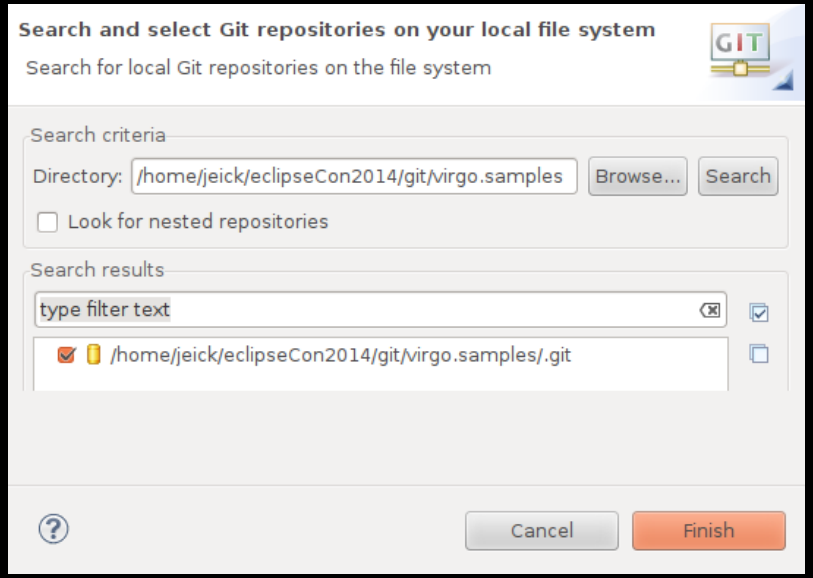
```
git clone https://github.com/eclipse/virgo.samples
```

USB Stick (Get local copy of the Git repository)

unzip /usb/virgo.samples_GITrepo.zip -d <your working dir>/git/

Import Git repo





Next Goal: Export first OSGi service

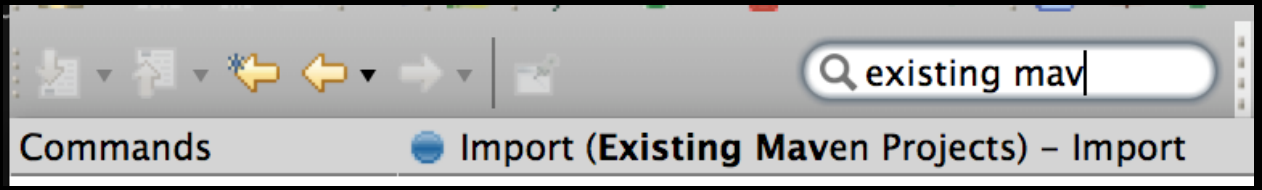
Idea: Export mock OSGi service to allow other developers on the team to start integrating with your module

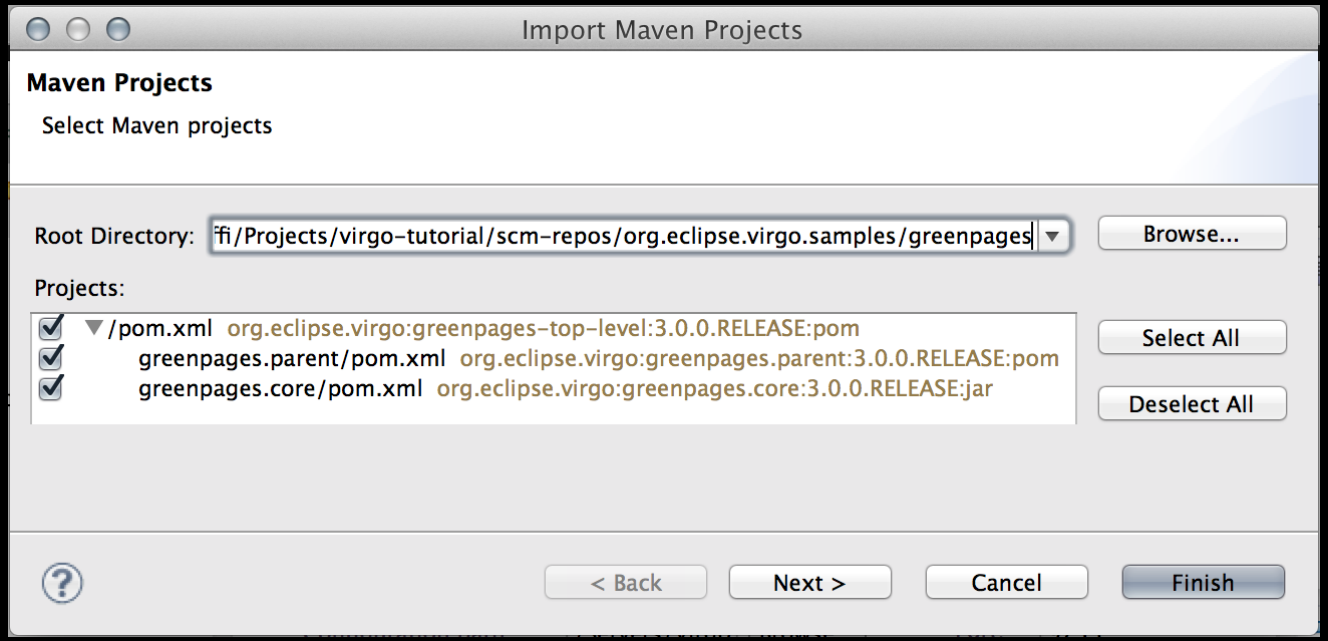
Safepoint 0 - Start Here

```
git checkout safepoint_00_start_here
```

Import... -> Existing Maven Projects

0.1 Import existing Maven project





0.2 Activate the mock OSGi service

Export Spring bean “**directory**” as OSGi service

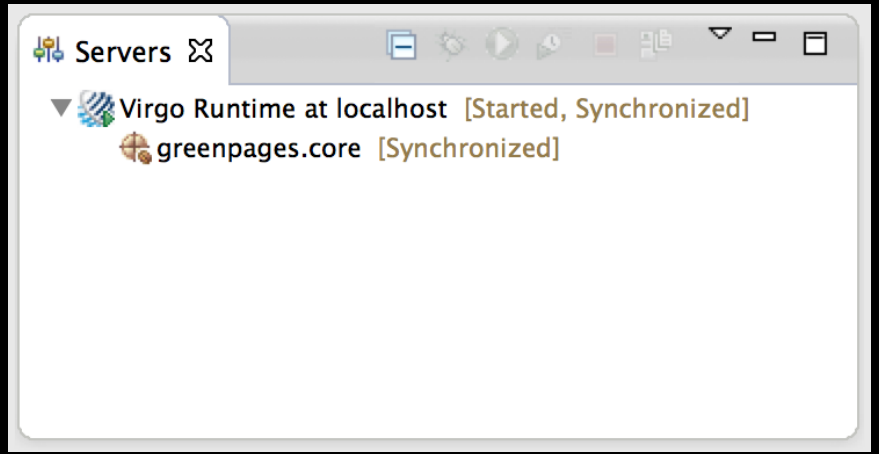
META-INF/spring/osgi-context.xml

```
<beans xmlns=...>
    <osgi:service interface="greenpages.Directory"
          ref="directory"/>
</beans>
```

0.3 Deploy the mock bundle

Add OSGi Bundle Project Nature

Deploy the bundle
(drag'n'drop)



0.4 Check if the service is running

```
osgi> services *Directory
{greenpages.Directory}={org.eclipse.gemini.blueprint.bean.name=directory,
org.springframework.osgi.bean.name=directory, osgi.service.blueprint.
compname=directory, Bundle-SymbolicName=greenpages.core, Bundle-Version=3.
0.0.RELEASE, service.id=260}
  "Registered by bundle:" greenpages.core_3.0.0.RELEASE [140]
```

Safepoint 1 - First OSGi service

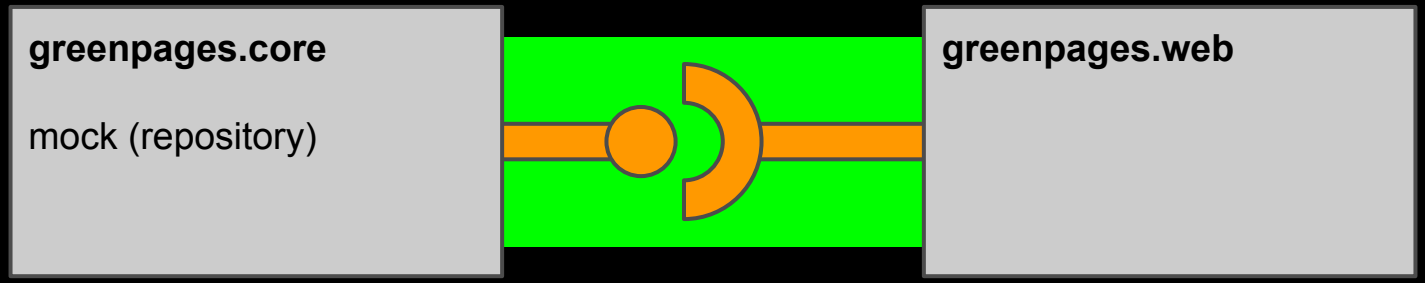
```
git diff safepoint_01_provide_ui
```

Prepare for next goal:

```
git checkout safepoint_01_provide_ui
```

import -> existing Maven Project greenpages.web

Next Goal: Provide UI



- Wire exported OSGi service `Directory`
- Make web application available

1.0 Ping web application

Set OSGi aware contextClass in `web.xml`

```
<context-param>
        <param-name>contextClass</param-name>
        <param-value>org.eclipse.virgo.web.dm.ServerOsgiBundleXmlWebApplicationContext</param-value>
 </context-param>
```

Add OSGi Web-ContextPath in `pom.xml`

```
        <Web-ContextPath>greenpages</Web-ContextPath>
```

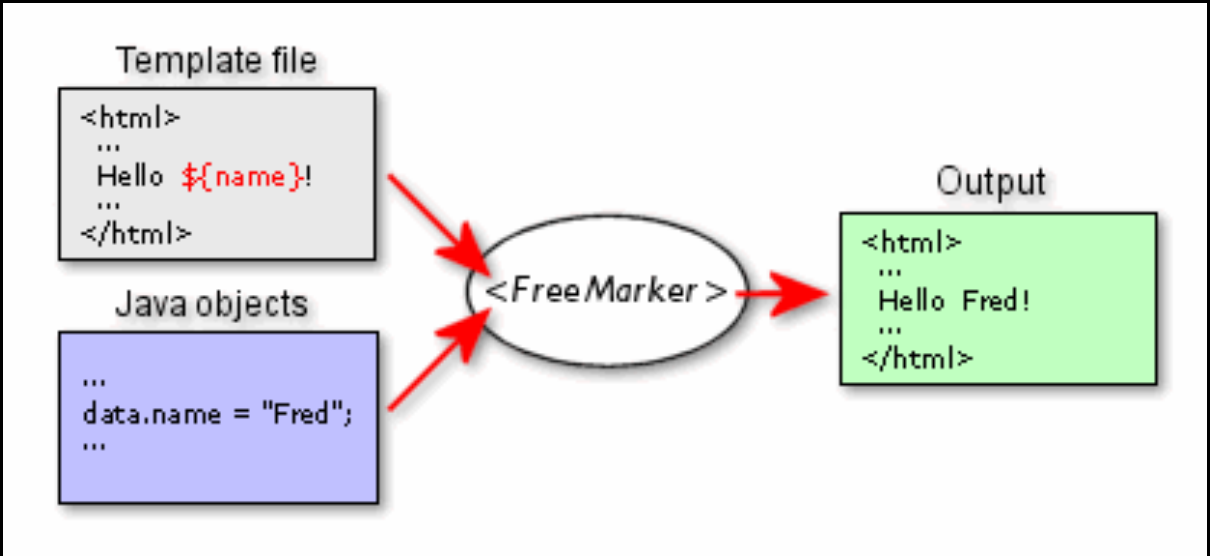
Visit GreenPages application

http://localhost:8080/greenpages/

1.1 First contact

http://localhost:8080/greenpages/

1.2 Web Presentation Layer



<FreeMarker> http://freemarker.org/

1.3 Import OSGi service “Directory”

Import OSGi service and publish as “**directory**” bean

WEB-INF/applicationContext.xml

```
<beans xmlns=...>
    <osgi:reference interface="greenpages.Directory"
          id="directory"/>
</beans>
```

1.4 Let Virgo autowire OSGi Service

@Autowired field `directory` in `GreenPagesController`

1.5 Use autowired service

Implement web endpoints:

```
@RequestMapping("/search.htm")
@RequestMapping("/entry.htm")
```

Safepoint 2 - Provide UI

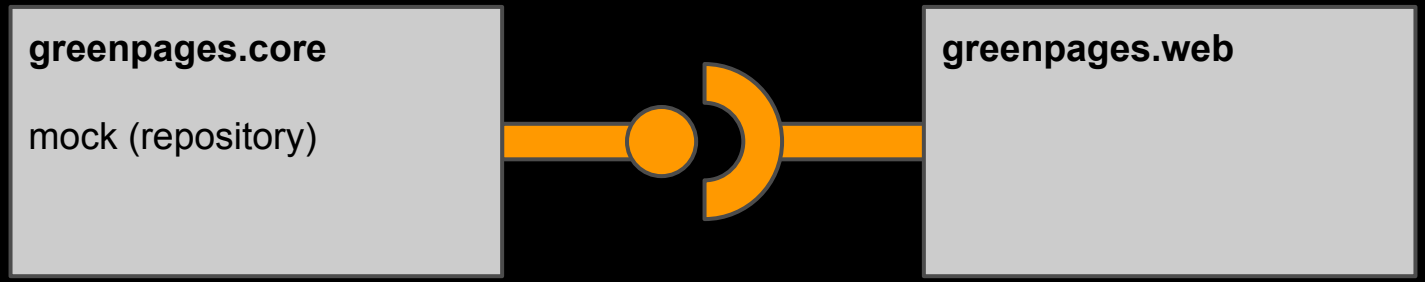
```
git diff safepoint_02_datasource
```

Prepare for next goal:

```
git checkout safepoint_02_datasource
```

import -> existing Maven Project greenpages.db

Next Goal: Prepare database



2.1 Export `javax.sql.DataSource`

Export Spring bean “**dataSource**” as OSGi service

`META-INF/spring/osgi-context.xml`

```
<beans xmlns=...>
    <osgi:service … />
</beans>
```

2.2 Add OSGi Console Commands

Provide “**execute**” and “**queryForInt**” as OSGi commands

```
<osgi:service ref="sqlCommandProvider" auto-export="all-classes">
  <osgi:service-properties>
    <entry key="osgi.command.scope">
      <value>sql</value>
    </entry>
    <entry key="osgi.command.function">
      <array value-type="java.lang.String">
        <value>execute</value>
        <value>queryForInt</value>
      </array>
    </entry>
  </osgi:service-properties>
</osgi:service>
```

2.3 Implement SQL commands

Implement SQL commands in `SqlCommandProvider`:

```
public void execute(String[] args)

public int queryForInt(String[] args)
```

2.4 Register Spring bean

```
<bean id="sqlCommandProvider"    class="greenpages.
db.internal.SqlCommandProvider"
    p:jdbcTemplate-ref="jdbcTemplate" />
```

2.5 Insert test data

```
$> telnet localhost 2501
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
osgi> sql:execute CREATE TABLE …
osgi> sql:execute INSERT INTO LISTING VALUES(...)
...
osgi> sql:queryForInt SELECT COUNT(*) FROM LISTING
```

Safepoint 3 - Provide Datasource

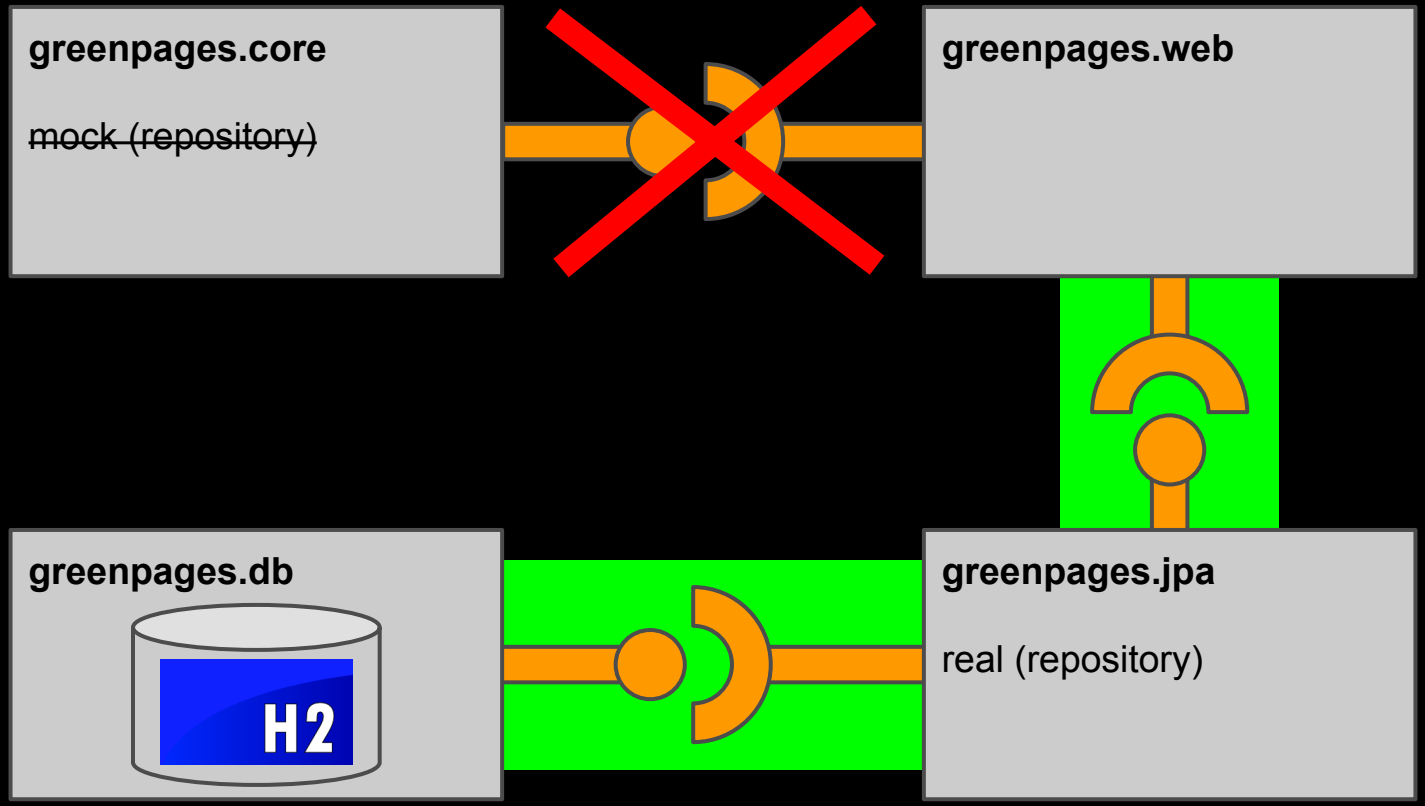
```
git diff safepoint_03_persistence
```

Prepare for next goal:

```
git checkout safepoint_03_persistence
```

import -> existing Maven Project greenpages.jpa

Next Goal: Persistence



3.1 Rewire OSGi services

```
<beans xmlns=...>
    <osgi:service … />
    <osgi:reference … />
</beans>
```

Safepoint 4 - Persistence

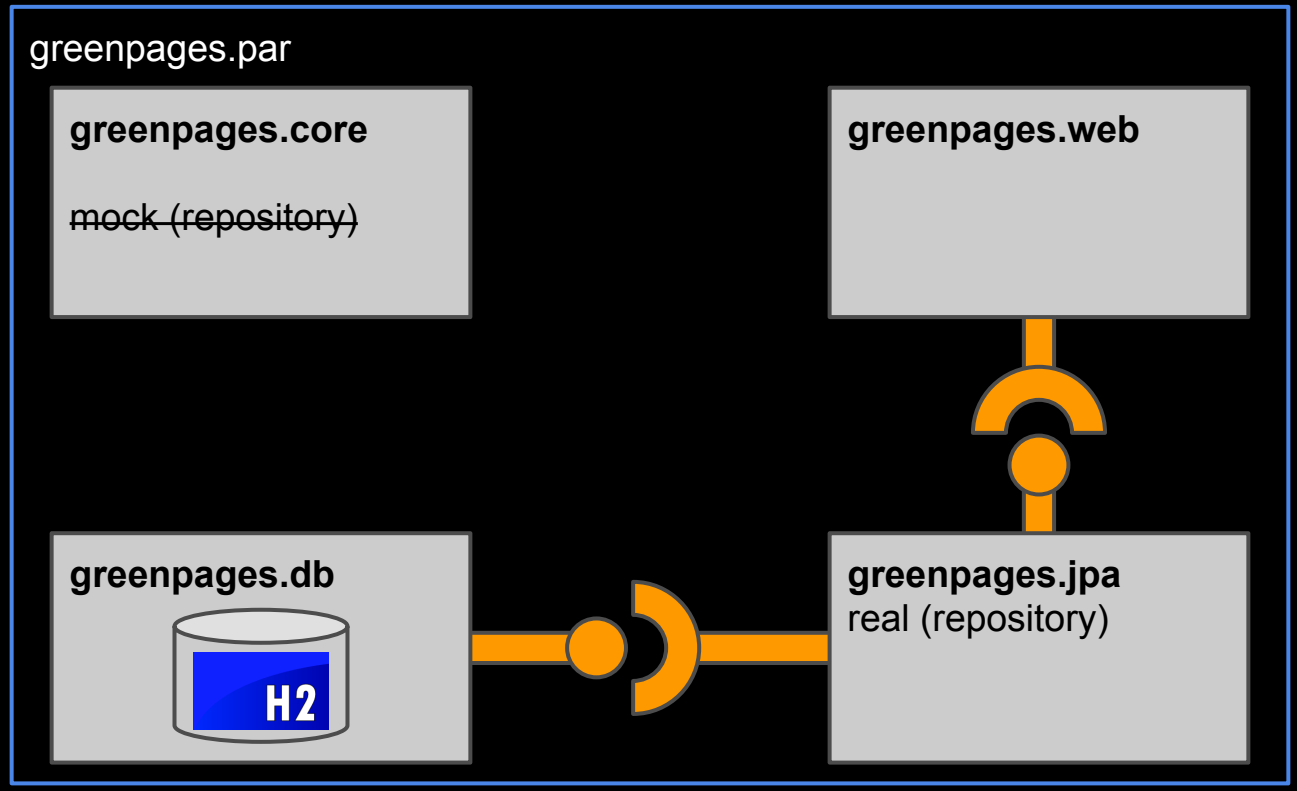
```
git diff safepoint_04_packaging
```

Prepare for next goal:

```
git checkout safepoint_04_packaging
```

import -> existing Maven Project greenpages.par

Next Goal: Single Deployment Unit



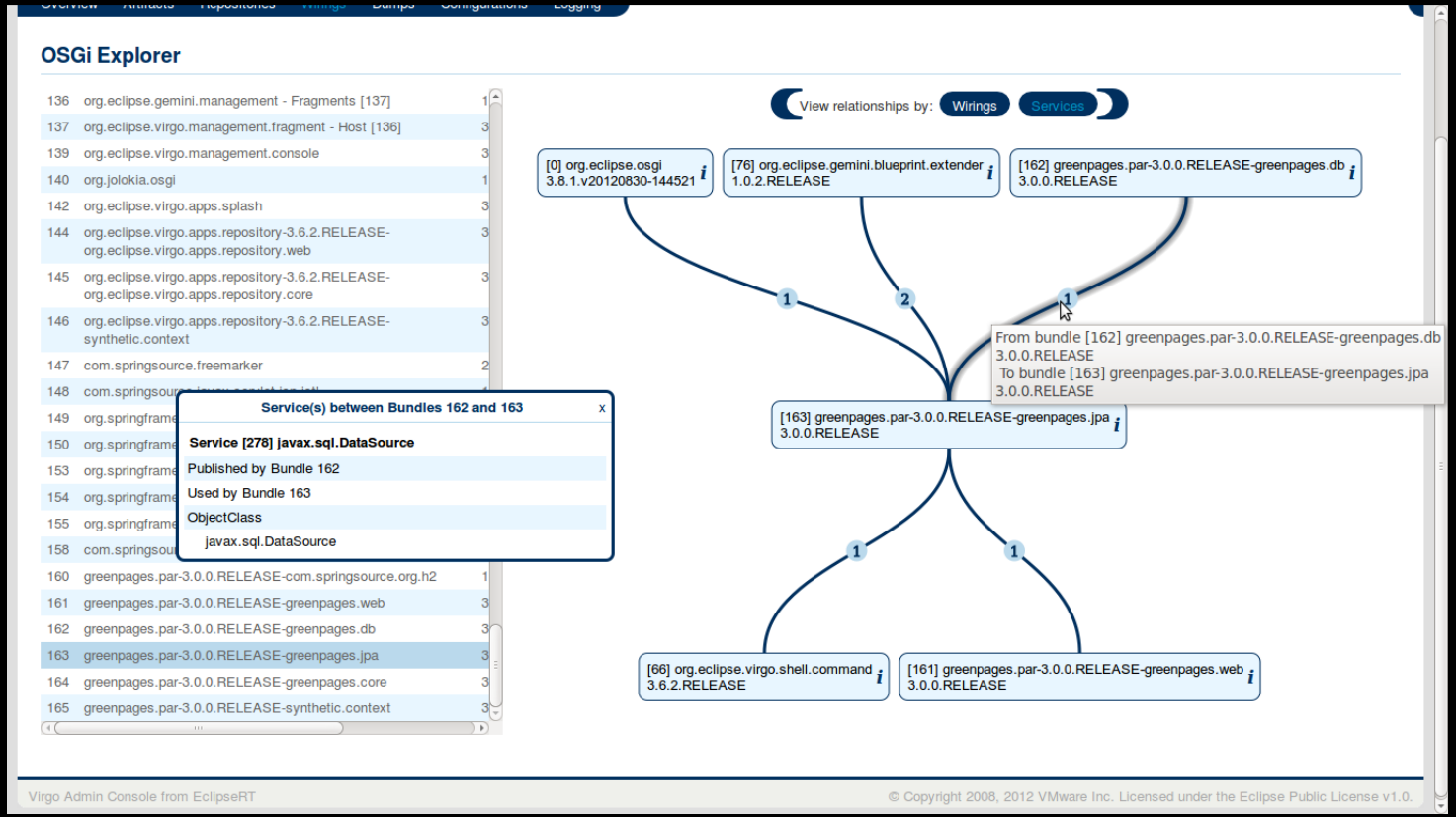
Package greenpages

```
mvn package
```

Deploy greenpages

```
cp greenpages.par ${VIRGO_HOME}/pickup
```

Inspection via Admin Console



Congratulations, you made it!

Thank you!

Who has/can load a class?

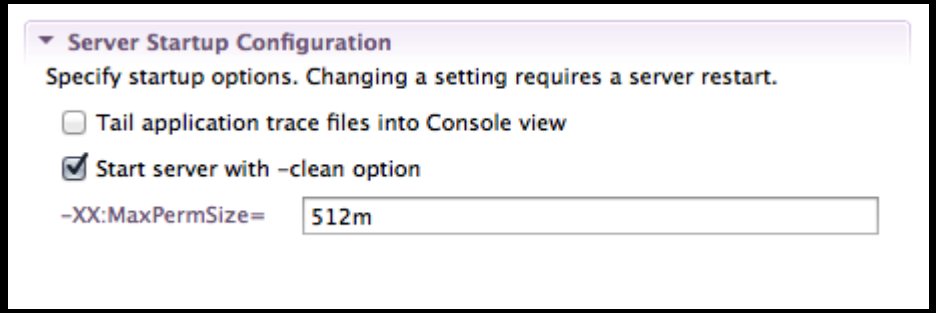
```
osgi> clhas greenpages.Directory
Bundles containing [greenpages/Directory.class]:
  136    greenpages.core
         /greenpages/Directory.class

osgi> clload greenpages.Directory
Successfully loaded [greenpages.Directory] from:
  136    greenpages.core
  137    greenpages.web
         [provided by 136 greenpages.core]
  133    osgi.enterprise
         [provided by 136 greenpages.core]
```

miscellaneous

Clean start `${VIRGO_HOME}/bin/startup.sh -clean`

Debug Virgo `${VIRGO_HOME}/bin/startup.sh -debug -suspend`

Virgo logs `${VIRGO_HOME}/serviceability/logs/`



Evaluate This Session

1. Sign-in: www.eclipsecon.org
2. Select session from schedule
3. Evaluate: +1 0 -1

SAN FRANCISCO
MARCH 17-20, 2014