

Java EE

Olivier Gutierrez

Le framework Spring

La programmation orientée aspect

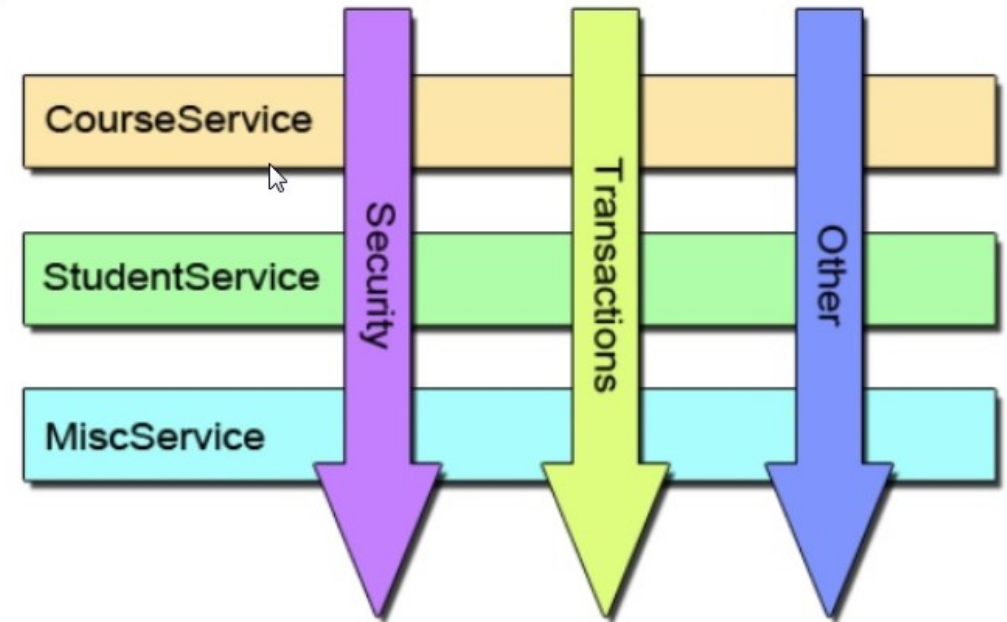
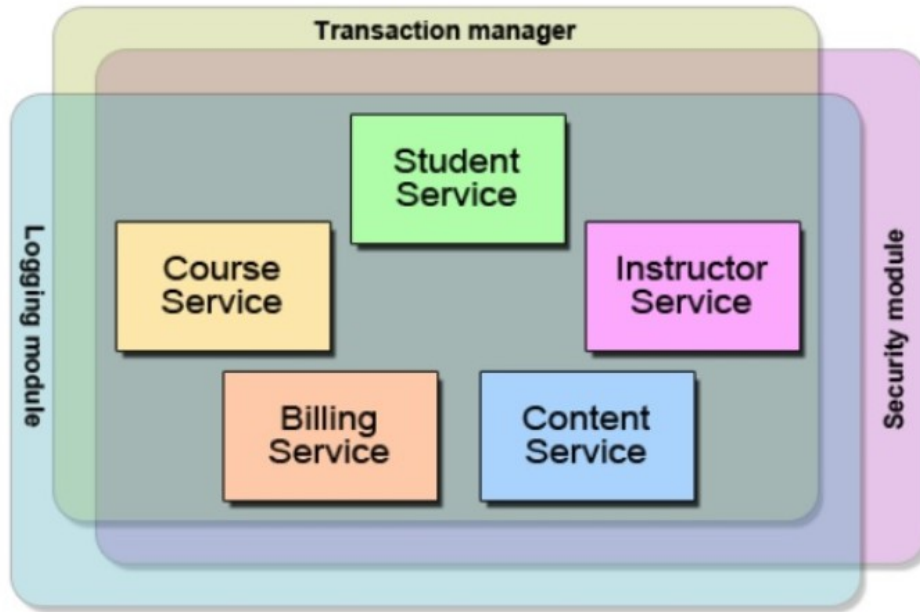


Sommaire

- La programmation orientée aspect
- Application au projet précédent

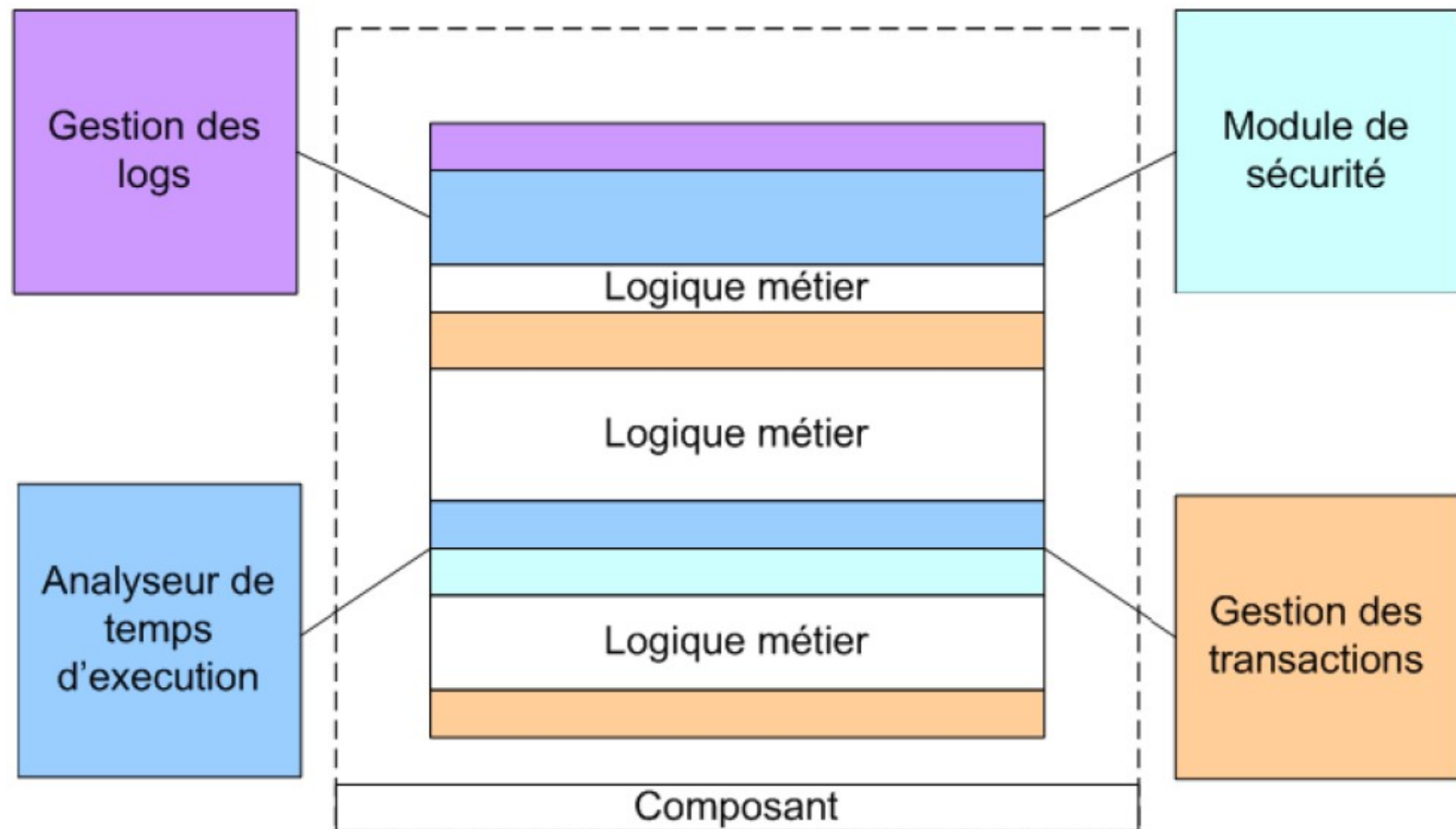
La programmation orientée aspect

La programmation orientée aspect AOP



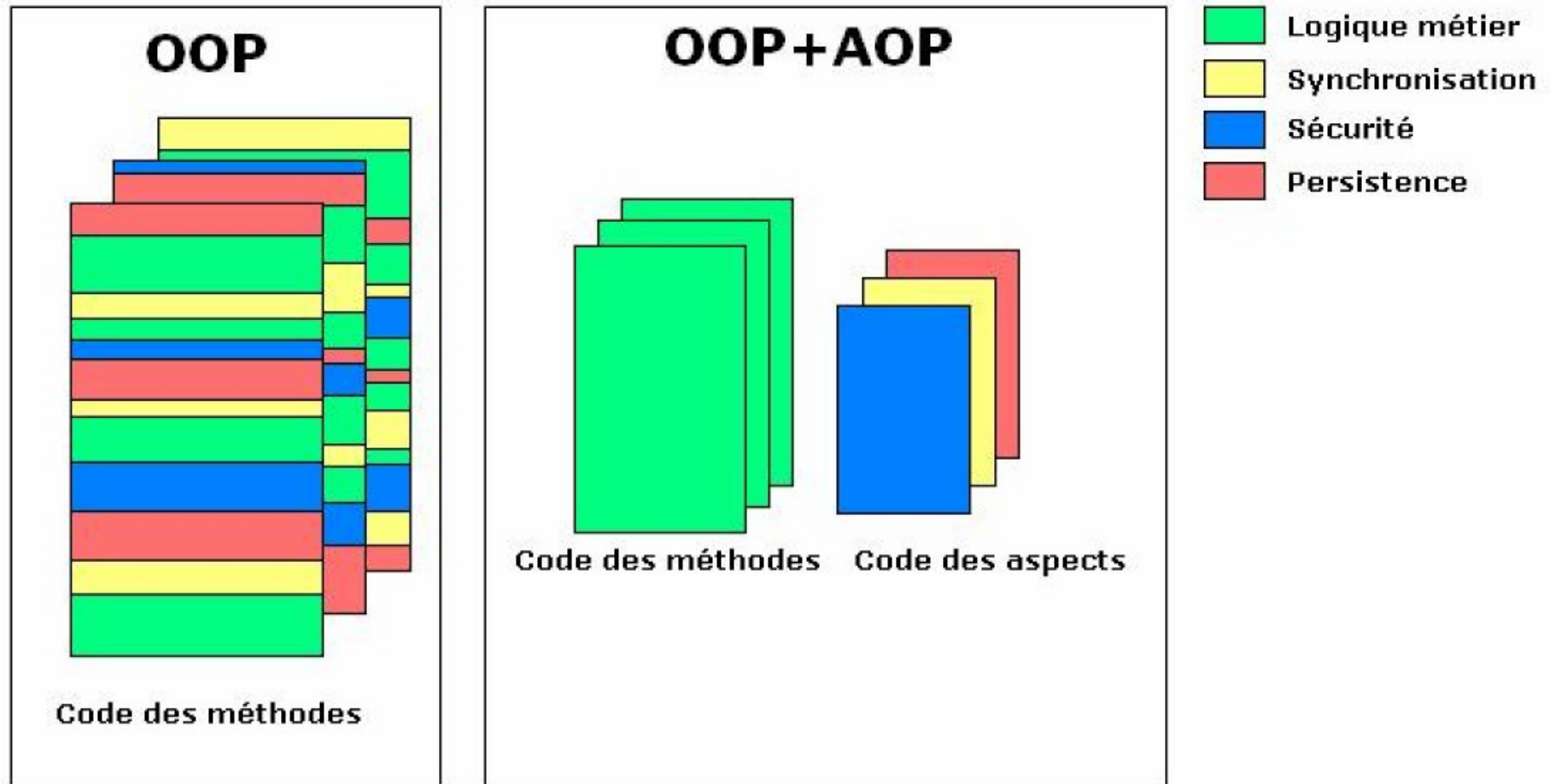
chaque module gère des aspects différents du système, sécurité, transactions, log, etc.

La programmation orientée aspect AOP



Habituellement les différents aspects sont entremêlés

La programmation orientée aspect AOP



La programmation orientée aspect AoP

- L'AOP est utilisée par Spring pour fournir des fonctionnalités
 - Transverses, par exemple la gestion des transactions
 - Spécifiques, par exemple l'injection de dépendances dans un bean non géré par Spring
- Cela se fait de manières déclaratives dans la configuration XML ou grâce à des annotations
- L'extension AspectJ est utilisée par Spring depuis sa version 2.5

Application au projet précédent

Objectif :

rajouter des éléments techniques (logs) à des classes métiers sans ajouter une seule ligne de code à celles-ci

eclipse_sts_ws - Demo/pom.xml - Spring Tool Suite

File Edit Navigate Search Project Run Design Window Help

Package Explorer Navigator

- Demo [olivier master]
 - src/main/java
 - fr.formation.m2.spring
 - Hello.java
 - HelloImpl.java
 - Salutations.java
 - SalutationsImpl.java
 - Start.java
 - StartSalutations.java
 - src/main/resources
 - src/test/java
 - fr.formation.m2.spring
 - TestHello.java
 - JRE System Library [J2SE-1.5]
 - Maven Dependencies
 - src
 - target
 - pom.xml

Dashboard Start.java Salutations... StartSaluti... Demo/pom.xml »4

Dependencies

Filter:

Dependencies

- spring-context : \${spring-framework.version}
- spring-tx : \${spring-framework.version}
- slf4j-api : \${slf4j.version} [compile]
- logback-classic : \${logback.version} [runtime]
- hibernate-entitymanager : \${hibernate.version}
- spring-test : \${spring-framework.version} [test]
- junit : \${junit.version} [test]

Dependency Management

To manage your transitive dependency exclusions, please use the [Dependency Hierarchy](#) page.

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Console Progress Problems Search Properties

No consoles to display at this time.

Servers

- Pivotal tc Server Developer Edition v3.2 [Stopped]

Quick Access

Outline

project xmlns=http://mav

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

bouton 'add'

eclipse_sts_ws - Demo/pom.xml - Spring Tool Suite

File Edit Navigate Search Project Run Design Window Help

Package Explorer Navigator

- Demo [olivier master]
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Dashboard Start.java Salutations... StartSaluti... Demo/pom.xml »4

Dependencies

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- hibernate-entitymanager : \${hibernate.version}
- spring-test : \${spring-framework.version} [test]
- junit : \${junit.version} [test]

Dependency Management

To manage your transitive dependency exclusions, please

Overview Dependencies Dependency Hierarchy Effective

Console Progress Problems Search

No consoles to display at this time.

Servers

- Pivotal tc Server Developer Edition v3.2 [Stopped,

Select Dependency

Group Id: * aspectj

Artifact Id: * aspectjrt

Version: 1.5.4 Scope: compile

Enter groupId, artifactId or sha1 prefix or pattern (*):

aspectj

Search Results:

- aspectj aspectjlib
- aspectj aspectjrt
- aspectj aspectjtools
- aspectj aspectjweaver
- ch.abertschi.arquillian arquillian-extension-aspectj
- com.cargemini.platina.maven aspectj-maven-plugin
- com.coherentlogic.enterprise-data-adapter aspectj-int
- com.comcast.money money-aspectj_2.10
- com.comcast.money money-aspectj_2.11
- com.covisint.core aspectj-bom
- com.eoniantech.build aspectj-bom
- com.github.adedayo.eclipse.sdk org.eclipse.equinox.weaving.aspectj

OK Cancel

aspectjrt

eclipse_sts_ws - Demo/pom.xml - Spring Tool Suite

File Edit Navigate Search Project Run Design Window Help

Package Explorer Navigator

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Dashboard Start.java Salutations... StartSaluti... *Demo/pom.xml »4

Dependencies

Filter:

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- spring-tx : \${spring-framework.version}
- slf4j-api : \${slf4j.version} [compile]
- logback-classic : \${logback.version} [runtime]
- hibernate-entitymanager : \${hibernate.version}
- spring-test : \${spring-framework.version} [test]
- junit : \${junit.version} [test]
- aspectjrt : 1.5.4

Dependency Management

Add... Remove Properties...

Select Dependency

Group Id: * aspectj

Artifact Id: * aspectjweaver

Version: 1.5.4 Scope: compile

Enter groupId, artifactId or sha1 prefix or pattern (*):

aspectj

Search Results:

- aspectj aspectj-ant
- aspectj aspectj-tools
- aspectj aspectjlib
- aspectj aspectjrt
- aspectj aspectjtools
- aspectj aspectjweaver
- ch.abertschi.arquillian arquillian-extension-aspectj
- com.capgemini.platina.maven aspectj-maven-plugin
- com.coherentlogic.enterprise-data-adapter aspectj-int
- com.comcast.money money-aspectj_2.10
- com.comcast.money money-aspectj_2.11
- com.covisint.core aspectj-bom

OK Cancel

To manage your transitive dependency exclusions, please

Overview Dependencies Dependency Hierarchy Effective

Console Progress Problems Search

No consoles to display at this time.

Servers

- Pivotal tc Server Developer Edition v3.2 [Stopped]

project

Failure Trace

eclipse_sts_ws - Demo/pom.xml - Spring Tool Suite

File Edit Navigate Search Project Run Design Window Help

Package Explorer Navigator

- Demo [olivier master]
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Dashboard Start.java Salutations... StartSaluti... *Demo/pom.xml »4

Dependencies

Filter:

Dependencies	Dependency Management
spring-context : \${spring-framework.version}	
spring-tx : \${spring-framework.version}	
slf4j-api : \${slf4j.version} [compile]	
logback-classic : \${logback.version} [runtime]	
hibernate-entitymanager : \${hibernate.version}	
spring-test : \${spring-framework.version} [test]	
junit : \${junit.version} [test]	
aspectjrt : 1.5.4	
aspectjweaver : 1.5.4	

Add... Remove Properties... Manage...

To manage your transitive dependency exclusions, please use the [Dependency Hierarchy](#) page.

Overview Dependencies Dependency Hierarchy Effective POM pom.xml

Console Progress Problems Search Properties

No consoles to display at this time.

Servers

 - Pivotal tc Server Developer Edition v3.2 [Stopped]

Outline

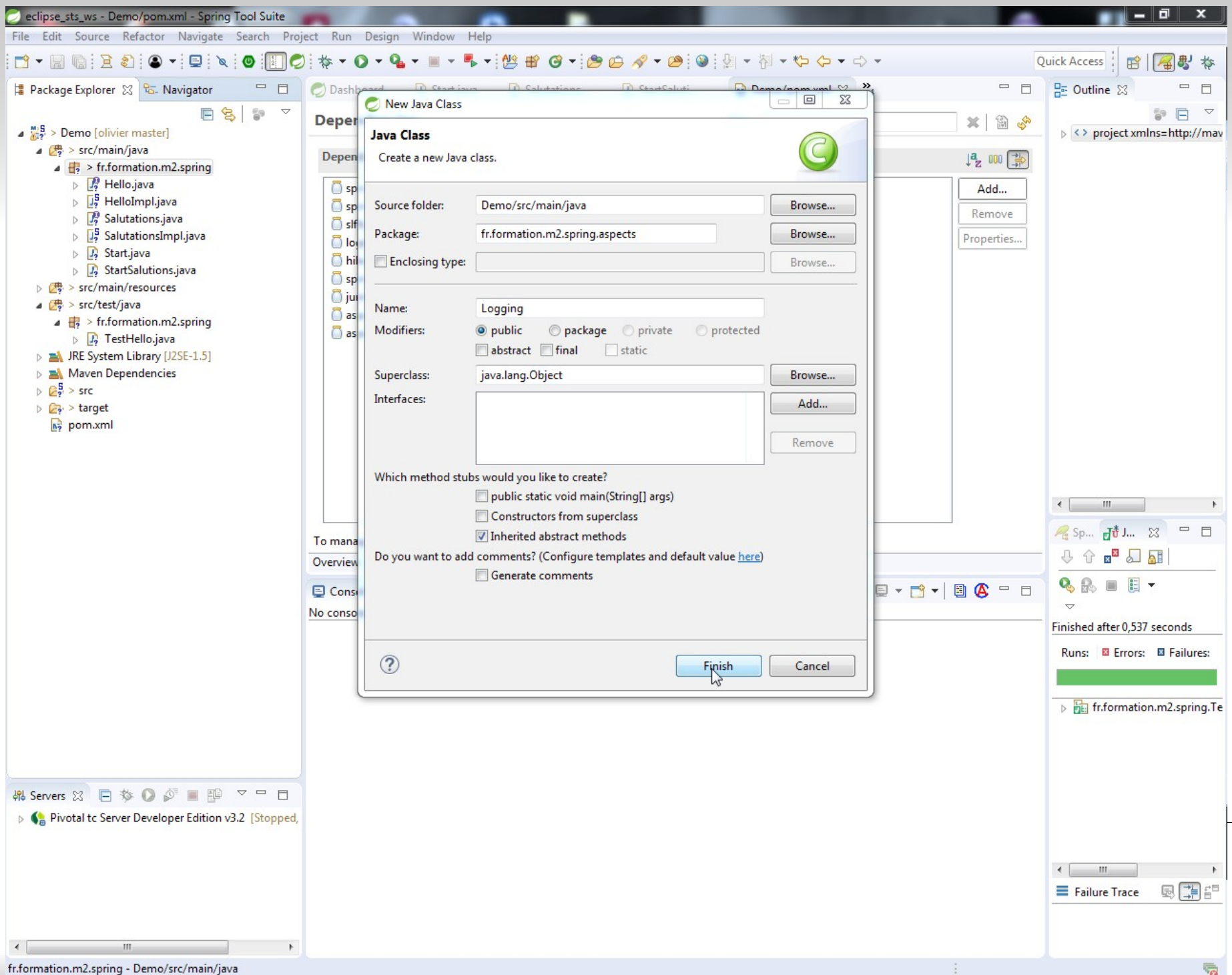
project xmlns=http://mav

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

les 2 dépendances créées



Logging.java

```

1 package fr.formation.m2.spring.aspects;
2
3 import org.aspectj.lang.JoinPoint;
4
5 public class Logging {
6
7     public void beforeMethod(JoinPoint joinPoint) {
8         // récupérer la signature de la méthode invoquée
9         String methodName = joinPoint.getSignature().toShortString();
10        // récupérer l'ensemble des paramètres transmis à la méthode
11        Object[] args = joinPoint.getArgs();
12        // construction d'une String avec tous les paramètres
13        // StringBuilder préférable à String pour construire une chaîne dynamiquement
14        StringBuilder builder = new StringBuilder();
15        builder.append("Méthode ");
16        builder.append(methodName);
17        builder.append(" invoquée avec les paramètres : ");
18        for (Object o : args) {
19            builder.append(o);
20            builder.append(" - ");
21        }
22        System.out.println(builder.toString());
23    }
24
25    public void afterMehod(JoinPoint joinPoint, Object result) {
26        String methodName = joinPoint.getSignature().toShortString();
27        System.out.println("Méthode " + methodName + " a produit le résultat " + result);
28    }
29 }
30
31

```

Package Explorer:

- fr.formation.m2.spring
 - Hello.java
 - HelloImpl.java
 - Salutations.java
 - SalutationsImpl.java
 - Start.java
 - StartSalutations.java
- fr.formation.m2.spring.aspects
 - Logging.java
- src/main/resources
 - app-context.xml
- src/test/java
- JRE System Library [J2SE-1.5]
- Maven Dependencies
- src
- target
- pom.xml

Outline:

- fr.formation.m2.spring.
 - Logging
 - beforeMethod(JoinPoint)
 - afterMehod(JoinPoint, Object)

Console: No consoles to display at this time.

Run View: Finished after 0,537 seconds. Runs: 1, Errors: 0, Failures: 0.

création des deux méthodes : avant et après invocation d'une classe métier

- Ajout d'une fonctionnalité technique 'Log' à nos classes métier
- Création d'une classe de log

The screenshot shows the Eclipse IDE interface. The Package Explorer on the left displays the project structure: Demo [olivier master] > src/main/java > fr.formation.m2.spring > Hello.java, HelloImpl.java, Salutations.java, SalutationsImpl.java, Start.java, StartSalutations.java, and fr.formation.m2.spring.aspects > Logging.java. The Outline view on the right shows the XML content of app-context.xml, including the namespace declaration: beans xmlns="http://www.springframework.org/schema/beans". The main editor area shows the 'Configure Namespaces' dialog for app-context.xml. The dialog lists various Spring namespaces, with 'aop' and 'beans' selected. The 'aop' namespace is highlighted with a mouse cursor. The dialog also shows the 'Source', 'Namespaces', 'Overview', 'aop', 'beans', and 'Beans Graph' tabs. The bottom status bar shows 'No consoles to display at this time.' and the bottom right corner shows the 'Run' button and the text 'Finished after 0,537 seconds'.

pour la réalisation du tissage (weaving) on a besoin d'un nouvel espace de nom 'aop'
(remarquez l'ajout d'un nouvel onglet 'aop')

The screenshot shows the Eclipse IDE with the Spring Tool Suite. The main editor displays the `app-context.xml` file. The **Namespaces** tab is active, showing the configuration for the XML namespaces. The **Configure Namespaces** section lists the XSD namespaces to use in the configuration file. The **Namespace Versions** section shows the available versions for the selected namespace.

Configure Namespaces

Select XSD namespaces to use in the configuration file

- ☒ aop - <http://www.springframework.org/schema/aop>
- ☒ beans - <http://www.springframework.org/schema/beans>
- ☐ c - <http://www.springframework.org/schema/c>
- ☐ cache - <http://www.springframework.org/schema/cache>
- ☐ context - <http://www.springframework.org/schema/context>
- ☐ jee - <http://www.springframework.org/schema/jee>
- ☐ lang - <http://www.springframework.org/schema/lang>
- ☐ p - <http://www.springframework.org/schema/p>
- ☐ task - <http://www.springframework.org/schema/task>
- ☐ tx - <http://www.springframework.org/schema/tx>
- ☐ util - <http://www.springframework.org/schema/util>

Namespace Versions

Select XSD (if none is selected the default will be used):

- ☐ <http://www.springframework.org/schema/aop/spring-aop>
- ☐ <http://www.springframework.org/schema/aop/spring-aop>
- ☐ <http://www.springframework.org/schema/aop/spring-aop>
- ☐ <http://www.springframework.org/schema/aop/spring-aop>
- ☐ <http://www.springframework.org/schema/aop/spring-aop>
- ☒ <http://www.springframework.org/schema/aop/spring-aop>

The console shows the application finished after 0.537 seconds.

Finished after 0,537 seconds

Runs: ■ Errors: ■ Failures:

fr.formation.m2.spring.Te

cliquer sur le texte de l'espace de nom fait apparaître les différentes versions disponibles
(avec la version par défaut sélectionnée)

The screenshot shows the Eclipse IDE interface with the Spring Beans configuration. The 'Create New Bean' dialog is open, and the 'Select Type' dialog is also open, showing a list of matching items for the 'logging' bean. The 'Logging' class from 'fr.formation.m2.spring.aspects' is selected. The background shows the 'Spring Beans' overview and the 'app-context.xml' file.

Spring Beans Overview

Select an element to edit its details.

type filter text

New Bean...

Up

Down

Create New Bean

Bean Definition

Enter bean attributes.

Bean definitions file:

\Demo\src\main\resources\app-context.xml

Browse...

Id: logging

Name:

Class:

Parent:

Ignore errors

Select Type

Select entries:

logging

Matching items:

- Logging - com.sun.javaafx.binding - [jdk1.8.0_92]
- Logging - com.sun.javaafx.scene.control - [jdk1.8.0_92]
- Logging - com.sun.javaafx.util - [jdk1.8.0_92]
- Logging - fr.formation.m2.spring.aspects - Demo/src/main/java
- Logging - fr.formation.spring.aspects - DemoSpring/src/main/java
- Logging - java.util.logging - [jdk1.8.0_92]
- logging
- logging_de
- logging_es
- logging_fr
- logging_it
- logging_ja
- logging_ko
- logging_pt_BR

Package Explorer

Demo [olivier master]

- src/main/java
 - fr.formation.m2.spring
 - Hello.java
 - HelloImpl.java
 - Salutations.java
 - SalutationsImpl.java
 - Start.java
 - StartSalutations.java
 - fr.formation.m2.spring.aspects
 - Logging.java
- src/main/resources
 - app-context.xml
- src/test/java
- JRE System Library [J2SE-1.5]
- Maven Dependencies
- src
- target
- pom.xml

Console

No consoles to display at this time

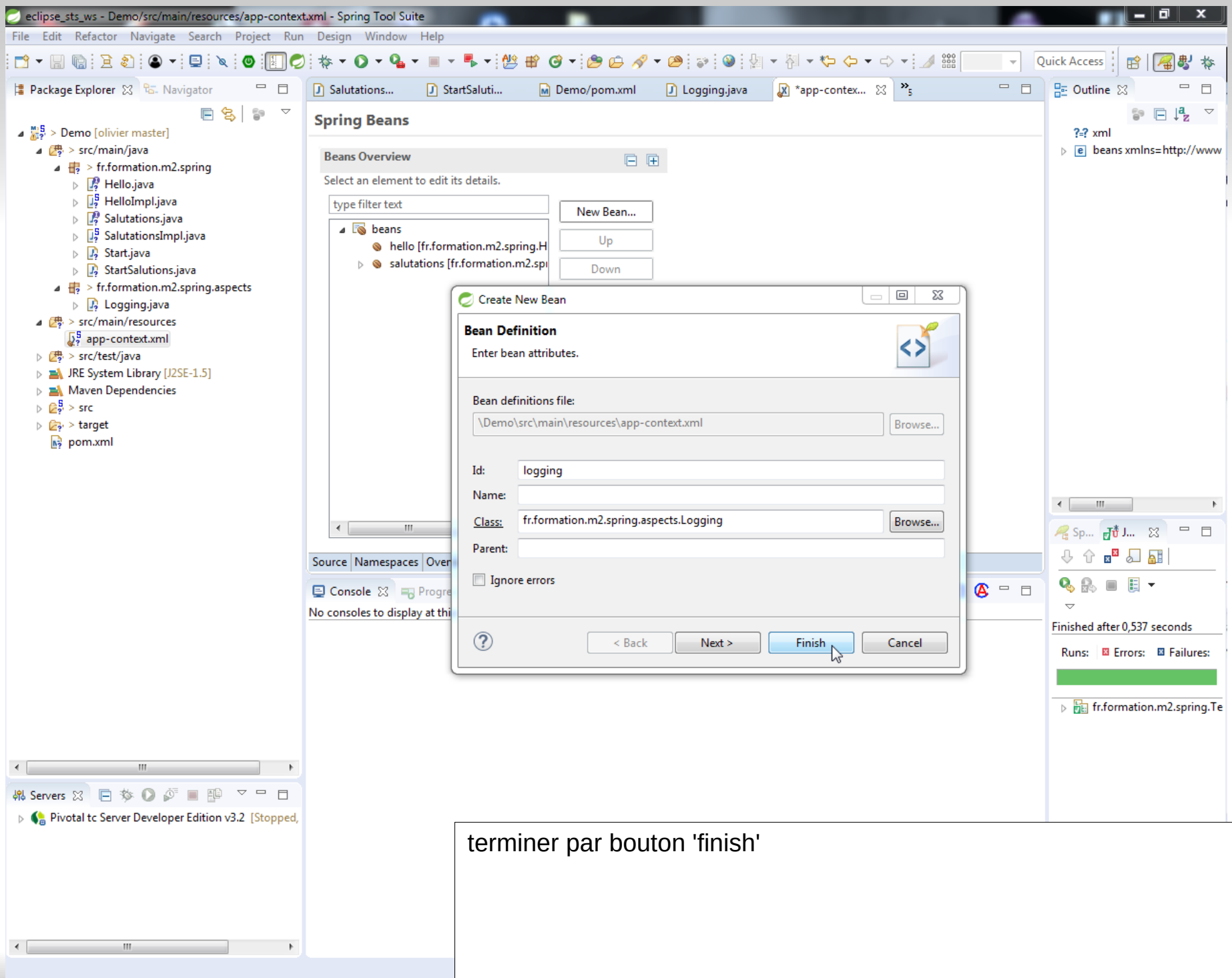
Servers

Pivotal tc Server Developer Edition v3.2 [Stopped]

Outline

beans xmlns=http://www

déclaration de l'aspect en tant que bean à part entière et indication de la classe associée



terminer par bouton 'finish'

The screenshot shows the Eclipse IDE with the Spring AOP configuration in `app-context.xml`. The 'beans' tab is selected in the 'aop' section. A context menu is open over the 'beans' tab, showing options to insert or delete elements. The 'Insert <aop:config> element' option is highlighted. The Package Explorer on the left shows the project structure, and the Console at the bottom shows a successful run of 'fr.formation.m2.spring.Te'.

il faut maintenant faire le tissage (le configurer)

- clic droit sur 'beans' dans l'onglet 'aop' (et pas dans l'onglet 'beans')
- choisir insert <aop:config>

eclipse_sts_ws - Demo/src/main/resources/app-context.xml - Spring Tool Suite

File Edit Refactor Navigate Search Project Run Design Window Help

Package Explorer Navigator

Salutations... StartSaluti... Demo/pom.xml Logging.java *app-context... »

Spring AOP

AOP Overview

Select an element to edit its details.

type filter text

beans

config

New Bean... Up Down

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

expose-proxy: proxy-target-class:

Documentation

Element : config

A section (compartmentalization) of AOP-specific configuration (ir

Content Model : (pointcut*, advisor*, aspect*)

[Click for additional documentation at springsource.org](#)

Source Namespaces Overview aop beans Beans Graph

Console Progress Problems Search Properties

No consoles to display at this time.

Servers

Pivotal tc Server Developer Edition v3.2 [Stopped,

beans/bean

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

le résultat

eclipse_sts_ws - Demo/src/main/resources/app-context.xml - Spring Tool Suite

File Edit Refactor Navigate Search Project Run Design Window Help

Package Explorer Navigator

Salutations... StartSaluti... Demo/pom.xml Logging.java *app-context... »

Spring AOP

AOP Overview

Select an element to edit its details.

type filter text New Bean... Up

- Insert <aop:advisor> element
- Insert <aop:aspect> element
- Insert <aop:pointcut> element
- Delete <aop:config> element

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

expose-proxy: proxy-target-class:

Documentation

Element : config
A section (compartmentalization) of AOP-specific configuration (ir Content Model : (pointcut*, advisor*, aspect*)
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Source Namespaces Overview aop beans Beans Graph

Console Progress Problems Search Properties

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Servers

Pivotal tc Server Developer Edition v3.2 [Stopped,

beans/bean

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

rajouter les pointcut

The screenshot shows the Eclipse IDE interface with the Spring AOP configuration editor open. The Package Explorer on the left shows the project structure, including the `app-context.xml` file. The main editor displays the `beans` namespace configuration, with a pointcut named `salutationsPointcut` selected. The `expression` is set to `execution(* fr.formation.spring.Salutations.*(..))`. The Element Details panel on the right provides information about the pointcut, including its ID and a link to additional documentation. The bottom status bar indicates that the application has finished running after 0.537 seconds.

Spring AOP

AOP Overview

Select an element to edit its details.

type filter text

New Bean... Up Down

beans

- config
 - pointcut salutationsPointcut

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

id*: salutationsPointcut

expression*: `execution(* fr.formation.spring.Salutations.*(..))`

Documentation

Element : pointcut
A named pointcut definition.
[Click for additional documentation at springsource.org](http://www.springsource.org)

Console

No consoles to display at this time.

Run Status

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

`execution(* fr.formation.spring.Salutations.*(..))`
premier * : tous les types de retour
2eme * : toutes les méthodes de cette classe

pour l'utilisation des wildcards, voir :

<http://www.eclipse.org/aspectj/doc/released/progguide/language-joinPoints.html>

eclipse_sts_ws - Demo/src/main/resources/app-context.xml - Spring Tool Suite

File Edit Refactor Navigate Search Project Run Design Window Help

Package Explorer Navigator

Salutations... StartSaluti... Demo/pom.xml Logging.java *app-context... »

Spring AOP

AOP Overview

Select an element to edit its details.

type filter text New Bean... Up

- Insert <aop:advisor> element
- Insert <aop:aspect> element
- Insert <aop:pointcut> element
- Delete <aop:config> element

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

expose-proxy: proxy-target-class:

Documentation

Element : config
A section (compartmentalization) of AOP-specific configuration (ir Content Model : (pointcut*, advisor*, aspect*)
[Click for additional documentation at springsource.org](#)

Source Namespaces Overview aop beans Beans Graph

Console Progress Problems Search Properties

No consoles to display at this time.

Servers

Pivotal tc Server Developer Edition v3.2 [Stopped,

beans/bean

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

définition de l'aspect (clic droit sur config)

eclipse_sts_ws - Demo/src/main/resources/app-context.xml - Spring Tool Suite

File Edit Refactor Navigate Search Project Run Design Window Help

Package Explorer Navigator

Salutations... StartSaluti... Demo/pom.xml Logging.java *app-context...

Spring AOP

AOP Overview

Select an element to edit its details.

type filter text

New Bean... Up Down

beans

- config
- pointcut salutationsPointcut
- aspect loggingAspect

id: logging
class: fr.formation.m2.spring.aspects.Logging
singleton: true
abstract: false
lazy-init: default
filename: src/main/resources/app-context.xml

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

id: loginAspect
order:
ref:

hello [HelloImpl] - src/main/resources/app-context.xml
loginAspect - src/main/resources/app-context.xml
logging [Logging] - src/main/resources/app-context.xml
salutations [SalutationsImpl] - src/main/resources/app-context.xml
salutationsPointcut - src/main/resources/app-context.xml

Source Namespaces Overview aop beans Beans Graph

Console Progress Problems Search Properties

No consoles to display at this time.

Servers

Pivotal tc Server Developer Edition v3.2 [Stopped]

beans/bean

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

choix du bean associé

eclipse_sts_ws - Demo/src/main/resources/app-context.xml - Spring Tool Suite

File Edit Refactor Navigate Search Project Run Design Window Help

Package Explorer Navigator

Salutations... StartSaluti... Demo/pom.xml Logging.java app-context.xml

Spring AOP

AOP Overview

Select an element to edit its details.

type filter text

- beans
 - config
 - pointcut salutationsPointcu
 - aspect loginAspect <loggi

New Bean... Up Down

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

id: loginAspect

order:

ref: logging

Documentation

Element : aspect
A named aspect definition.

Content Model : (pointcut | declare-parents | before | after | after-re

[Click for additional documentation at springsource.org](#)

Source Namespaces Overview aop beans Beans Graph

Console Progress Problems Search Properties

No consoles to display at this time.

Servers

Pivotal tc Server Developer Edition v3.2 [Stopped,

Outline

xml

beans xmlns=http://www

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

le résultat

eclipse_sts_ws - Demo/src/main/resources/app-context.xml - Spring Tool Suite

File Edit Refactor Navigate Search Project Run Design Window Help

Package Explorer Navigator

Salutations... StartSaluti... Demo/pom.xml Logging.java app-context.xml

Spring AOP

AOP Overview

Select an element to edit its details.

type filter text

beans

- config
- pointcut salutationsPointcu
- aspect loginAspect <loggi

New Bean... Up Down

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

id: loginAspect

order:

ref: logging

- Insert <aop:after> element
- Insert <aop:after-returning> element
- Insert <aop:after-throwing> element
- Insert <aop:around> element
- Insert <aop:before> element
- Insert <aop:declare-parents> element
- Insert <aop:pointcut> element
- Delete <aop:aspect> element

Source Namespaces Overview aop beans Beans Graph

Console Progress Problems Search Properties

No consoles to display at this time.

Servers

Pivotal tc Server Developer Edition v3.2 [Stopped,

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

association au bean loggingAspect de l' "advice" before...

The screenshot shows the Eclipse IDE with the Spring AOP configuration in `app-context.xml`. The `beans` namespace contains a `config` element with a `pointcut` and an `aspect` named `loggingAspect`. The `before` advice is selected, and a dropdown menu shows available methods, with `beforeMethod` highlighted.

Spring AOP Overview

Select an element to edit its details.

type filter text

New Bean... Up Down

beans

- config
 - pointcut salutationsPointcut
 - aspect loggingAspect <loggi
 - before

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

method*:

arg-names:

pointcut:

pointcut-ref:

type:

Documentation

Element : before

A before advice

[Click for additional information](#)

afterMehod (JoinPoint joinPoint, Object result) void - Logging

beforeMethod (JoinPoint joinPoint) void - Logging

equals (Object obj) void - Object

getClass() Class - Object

hashCode() void - Object

notify() void - Object

notifyAll() void - Object

toString() String - Object

wait (long timeout) void - Object

Source Namespaces Overview aop beans Beans Graph

Console **Progress** **Problems** **Search** **Properties**

No consoles to display at this time.

Servers

Pivotal tc Server Developer Edition v3.2 [Stopped]

Finished after 0,537 seconds

Runs: ■ Errors: ■ Failures:

fr.formation.m2.spring.Te

...à la méthode before correspondante

The screenshot displays the Eclipse IDE interface for configuring Spring AOP. The Package Explorer on the left shows the project structure, including the `src/main/resources` directory where `app-context.xml` is located. The Spring AOP Overview panel shows a tree of beans, with `salutationsPointcut` selected. The Element Details panel shows the configuration for the selected element, including the `method` property set to `beforeMethod`. A tooltip for `salutationsPointcut` is visible, showing its location in `src/main/resources/app-context.xml`. The bottom status bar shows the application finished after 0.537 seconds.

qui s'appliquera pour toutes les méthodes définies (dans le *pointCut* configuré précédemment) qui correspondent au poincut qu'on va indiquer

The screenshot shows the Eclipse IDE with the Spring AOP configuration editor open. The 'AOP Overview' tab is active, displaying a tree of beans. The 'after-returning' advice is selected, and its details are shown on the right. The 'returning' field is set to 'result'.

Spring AOP Overview

Select an element to edit its details.

type filter text

beans

- config
 - pointcut salutationsPointcut
 - aspect loginAspect <loggi
 - before beforeMethod
 - after-returning afterMeh

Buttons: New Bean..., Up, Down

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

method*: afterMehod

arg-names:

pointcut:

pointcut-ref: salutationsPointcut

returning: result

Documentation

Element : after-returning
An after-returning advice definition.
[Click for additional documentation at springsource.org](http://springsource.org)

Console

No consoles to display at this time.

Servers

Pivotal tc Server Developer Edition v3.2 [Stopped]

Outline

xml

beans xmlns=http://www

Run Status

Finished after 0,537 seconds

Runs: Errors: Failures:

fr.formation.m2.spring.Te

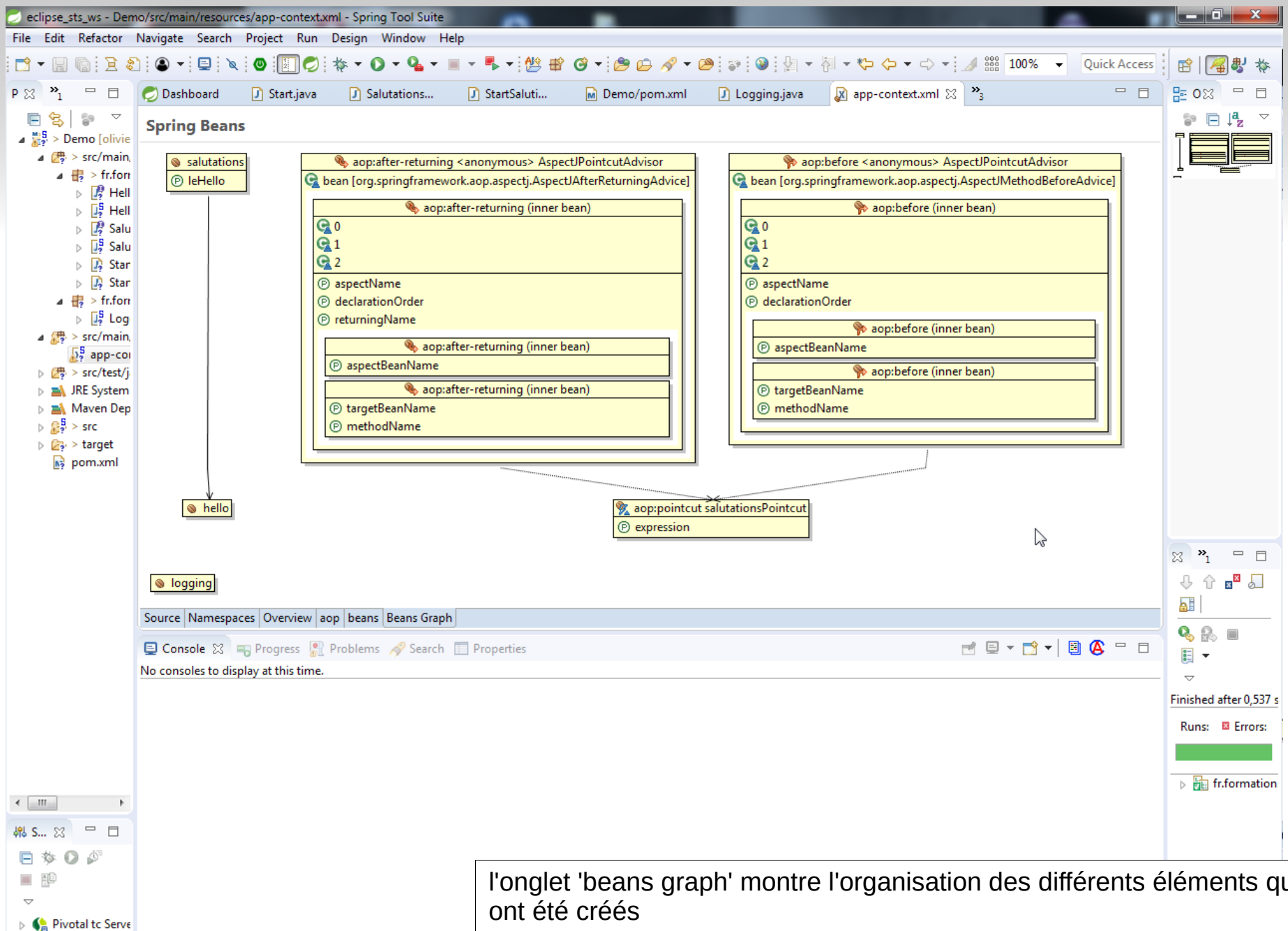
pareil pour le pointcut after : le champ 'returning' contient le nom du paramètre de la méthode afterMethod soit result
(le nom de la variable doit correspondre)

The screenshot displays the Eclipse IDE interface with the following components:

- Package Explorer:** Shows the project structure for 'Demo [olivier master]'. The package 'fr.formation.m2.spring.aspects' contains 'Logging.java'. The package 'fr.formation.m2.spring' contains 'Hello.java', 'HelloImpl.java', 'Salutations.java', 'SalutationsImpl.java', 'Start.java', and 'StartSalutations.java'.
- Editor:** Displays the 'Logging.java' file. The code defines an aspect with two methods: 'beforeMethod' and 'afterMehod' (note the typo). The 'afterMehod' method takes a 'result' parameter, which is highlighted in blue in the original image. The code uses 'joinPoint.getSignature().toShortString()' to get the method name and 'joinPoint.getArgs()' to get the arguments. It uses 'StringBuilder' to build a log message.
- Outline:** Shows the class structure of 'fr.formation.m2.spring.Logging', listing 'beforeMethod(JoinPoint)' and 'afterMehod(JoinPoint, Object)'.
- Console:** Shows 'No consoles to display at this time.'
- Bottom Right:** Shows a successful run of the application, 'fr.formation.m2.spring.Te', which finished after 0.537 seconds. The run status is 'Runs: 1, Errors: 0, Failures: 0'.

```
1 package fr.formation.m2.spring.aspects;
2
3 import org.aspectj.lang.JoinPoint;
4
5 public class Logging {
6
7     public void beforeMethod(JoinPoint joinPoint) {
8         // récupérer la signature de la méthode invoquée
9         String methodName = joinPoint.getSignature().toShortString();
10        // récupérer l'ensemble des paramètres transmis à la méthode
11        Object[] args = joinPoint.getArgs();
12        // construction d'une String avec tous les paramètres
13        // StringBuilder préférable à String pour construire une chaîne dynamiquement
14        StringBuilder builder = new StringBuilder();
15        builder.append("Méthode ");
16        builder.append(methodName);
17        builder.append(" invoquée avec les paramètres : ");
18        for (Object o : args) {
19            builder.append(o);
20            builder.append(" - ");
21        }
22        System.out.println(builder.toString());
23    }
24
25    public void afterMehod(JoinPoint joinPoint, Object result) {
26        String methodName = joinPoint.getSignature().toShortString();
27        System.out.println("Méthode " + methodName + " a produit le résultat " + result);
28    }
29 }
30
31
```

le paramètre 'result' surligné dans la méthode afterMethod



l'onglet 'beans graph' montre l'organisation des différents éléments qui ont été créés

bien aller voir aussi :

- les indications rajoutées (flèches) dans les méthodes de la classe de log
- pareil dans le source app-context.xml
- la flèche entrant dans la méthode de la classe Salutations (qui indique 2 marqueurs AOP)

The screenshot displays the Eclipse IDE interface for a Spring AOP project. The Package Explorer on the left shows the project structure, including the 'src/main/resources' directory where 'app-context.xml' is located. The central editor shows the 'beans' configuration in 'app-context.xml', with a 'pointcut salutationsPoint' defined. The 'Element Details' panel on the right shows the 'id' as 'salutationsPointcut' and the 'expression' as 'execution(* fr.formation.spring.Salutations.*(..))'. The bottom right shows a 'Spring Explorer' window with a 'JU...' button and a 'Finished after 0,537 seconds' status bar.

Spring AOP

AOP Overview

Select an element to edit its details.

type filter text

beans

config

pointcut salutationsPoint

aspect loginAspect <log

before beforeMethod

after-returning afterM

New Bean...

Up

Down

Element Details

Set the properties of the selected element. Required fields are denoted by "*".

id*: salutationsPointcut

expression*: execution(* fr.formation.spring.Salutations.*(..))

Documentation

Element : pointcut

A named pointcut definition.

[Click for additional documentation at springsource.org](http://springframework.org)

Source | Namespaces | Overview | aop | beans | Beans Graph

Console | Progress | Problems | Search | Properties

No consoles to display at this time.

Spring Explorer

JU...

Finished after 0,537 seconds

Runs: 1/1 Errors: 0 Failures: 0

fr.formation.m2.spring.TestHello [R]

écriture d'une nouvelle classe de test 'TestSalutation'

eclipse_sts_ws - Demo/src/test/java/fr/formation/m2/spring/TestSalutations.java - Spring Tool Suite

File Edit Source Refactor Navigate Search Project Run Window Help

Package Explorer Navigator Salutations... StartSaluta... Logging.java app-context.xml TestSalutati... »

1 package fr.formation.m2.spring;

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```
eclipse_sts_ws - Demo/src/test/java/fr/formation/m2/spring/TestSalutations.java - Spring Tool Suite
File Edit Source Refactor Navigate Search Project Run Window Help

<terminated> C:\Program Files\Java\jdk1.8.0_92\bin\javaw.exe (2 févr. 2018 à 18:45:19)
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ Demo ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] Copying 1 resource
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ Demo ---
[INFO] Nothing to compile - all classes are up to date
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ Demo ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory D:\olivier\eclipse_sts_ws\Demo\src\test\resources
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ Demo ---
[INFO] Nothing to compile - all classes are up to date
[INFO] --- maven-surefire-plugin:2.12.4:test (default-test) @ Demo ---
[INFO] Surefire report directory: D:\olivier\eclipse_sts_ws\Demo\target\surefire-reports

-----
T E S T S
-----
Running fr.formation.m2.spring.TestHello
févr. 02, 2018 6:45:25 PM org.springframework.context.support.AbstractApplicationContext prepareRefresh
INFOS: Refreshing org.springframework.context.support.ClassPathXmlApplicationContext@6aceb1a5: startup date [Fri Feb 02 18:45:25 CET 2018]; root of context hierarchy
févr. 02, 2018 6:45:25 PM org.springframework.beans.factory.xml.XmlBeanDefinitionReader loadBeanDefinitions
INFOS: Loading XML bean definitions from class path resource [app-context.xml]
févr. 02, 2018 6:45:25 PM org.springframework.beans.factory.support.DefaultListableBeanFactory preInstantiateSingletons
INFOS: Pre-instantiating singletons in org.springframework.beans.factory.support.DefaultListableBeanFactory@4d95d2a2: defining beans [hello,salutations,logging,org.spring
Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 1.012 sec
févr. 02, 2018 6:45:25 PM org.springframework.context.support.AbstractApplicationContext prepareRefresh
INFOS: Refreshing org.springframework.context.support.ClassPathXmlApplicationContext@2e4b8173: startup date [Fri Feb 02 18:45:25 CET 2018]; root of context hierarchy
févr. 02, 2018 6:45:25 PM org.springframework.beans.factory.xml.XmlBeanDefinitionReader loadBeanDefinitions
INFOS: Loading XML bean definitions from class path resource [app-context.xml]
Running fr.formation.m2.spring.TestSalutations
févr. 02, 2018 6:45:25 PM org.springframework.beans.factory.support.DefaultListableBeanFactory preInstantiateSingletons
INFOS: Pre-instantiating singletons in org.springframework.beans.factory.support.DefaultListableBeanFactory@636be97c: defining beans [hello,salutations,logging,org.spring
Méthode Salutations.saluerQuelqun(..) invoquée avec les paramètres : Jacques - 
Méthode Salutations.saluerQuelqun(..) a produit le résultat Hello Jacques, comment allez-vous ?
Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.053 sec

Results :

Tests run: 2, Failures: 0, Errors: 0, Skipped: 0

[INFO] --- maven-jar-plugin:2.4:jar (default-jar) @ Demo ---
[INFO] --- maven-install-plugin:2.4:install (default-install) @ Demo ---
[INFO] Installing D:\olivier\eclipse_sts_ws\Demo\target\Demo-0.0.1-SNAPSHOT.jar to C:\Users\olivier\.m2\repository\org\springframework\samples\Demo\0.0.1-SNAPSHOT\Demo-0.
[INFO] Installing D:\olivier\eclipse_sts_ws\Demo\pom.xml to C:\Users\olivier\.m2\repository\org\springframework\samples\Demo\0.0.1-SNAPSHOT\Demo-0.0.1-SNAPSHOT.pom
[INFO] BUILD SUCCESS
[INFO] Total time: 4.445 s
[INFO] Finished at: 2018-02-02T18:45:26+01:00
[INFO] Final Memory: 10M/245M
[INFO] -----
```

le résultat avec l'appel des méthodes before et after lors du test TestSalutations

On a pu rajouter des éléments techniques (logs) sur des éléments métiers sans ajouter de ligne de code dans le code métier. Tout s'est fait par tissage

Sources

- guide de programmation AspectJ

<http://www.eclipse.org/aspectj/doc/released/progguide/index.html>

- XML Schema Based AOP with Spring

https://www.tutorialspoint.com/spring/schema_based_aop_approach.htm