

# Structured Datatype Mappings Lab

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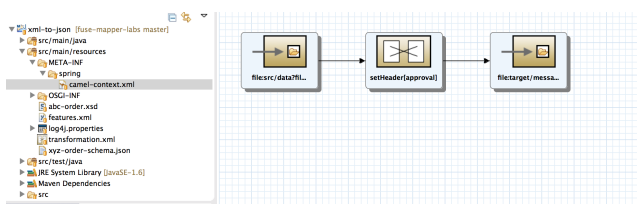
## Goals

- Import and modify a Fuse project to add a mapping activity that converts XML to a JSON object.
- Build and test the mapping.

## 1. Open the Lab

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1. Click the **Project Explorer** tab and expand the **xml-to-json** project node.
2. Navigate to **camel-context.xml** by clicking **src/main/java** → **META-INF** → **spring**



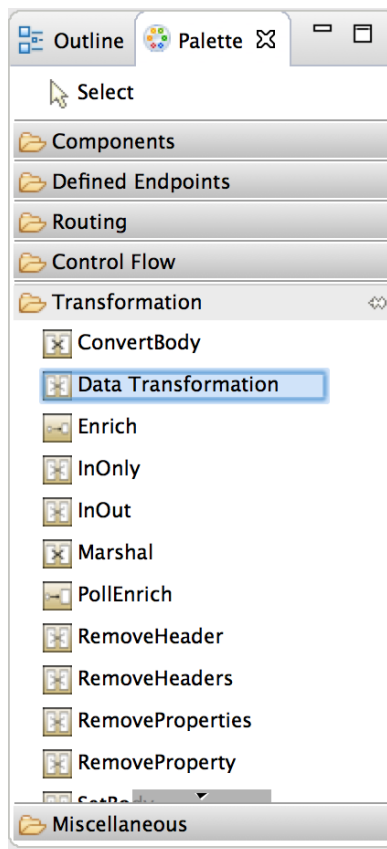
**Figure 1. Camel route**

## 2. Map XML Input Schema to JSON Output Schema

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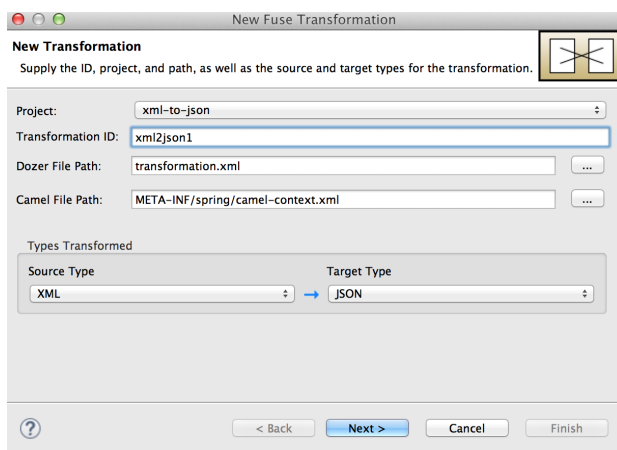
Here you add a Data Transformation tool activity to this route to map between the input and output objects.

1. Click the **Palette** tab on the right side of the canvas.
2. Click **Transformation**.



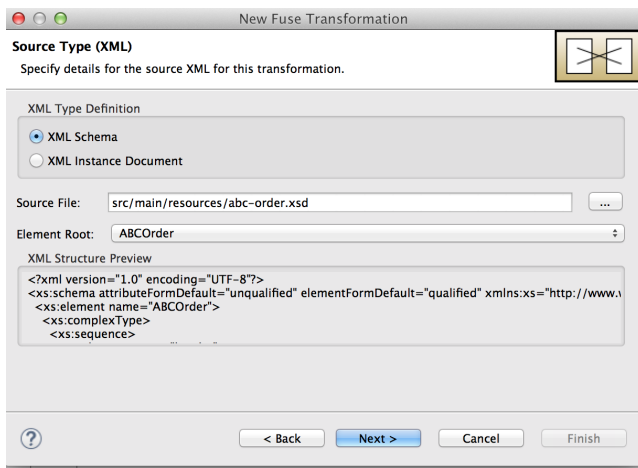
**Figure 2. Transformation drawer**

3. Select **Data Transformation** and drag it onto the canvas.
4. The **New Transformation** screen appears. Enter or select the following:
  - **Transformation ID:** `transform_xml_json`
  - **Source type:** `XML`
  - **Target type:** `JSON`



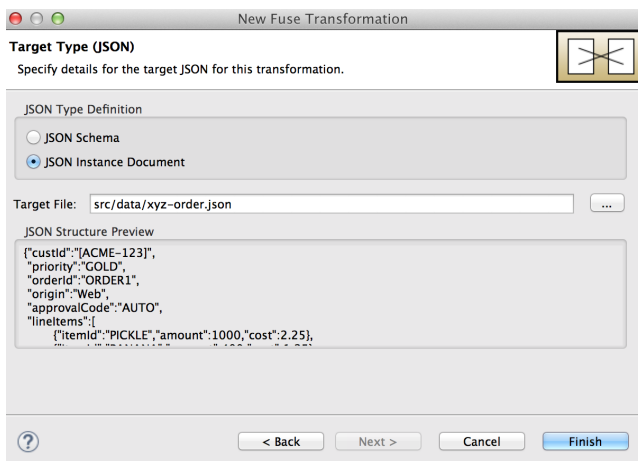
**Figure 3. New transformation activity**

5. Under **XML Type Definition**, select **XML Schema**.
6. In the **Source File** field, navigate to `abc_order.xsd`, and then click **Next..**



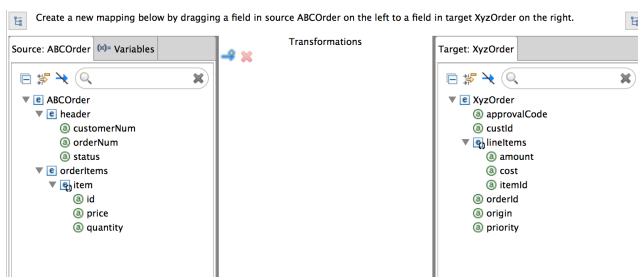
**Figure 4. XML type definition**

7. Under **JSON Type Definition**, select **JSON Instance Document**.
8. In the **Target File** field, navigate to **xyz-order.json**, and then click **Finish**.



**Figure 5. JSON type definition**

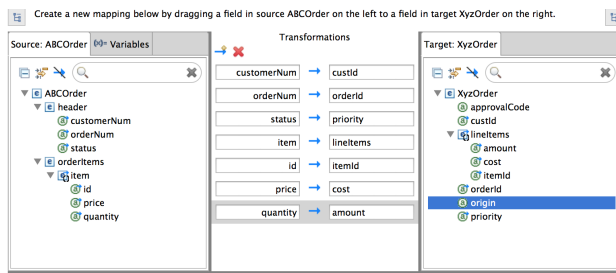
- The Data Transformation tool canvas is now ready.
9. Expand the input and output schemas. The canvas looks like this:



**Figure 6. Input and output schemas**

10. Drag and connect the following input fields to output fields. Note that before you map the nested elements, you map the parent-level **item** field in the input schema to the parent-level **lineItems** field in the output schema.
  - **customerNum** → **custId**
  - **orderNum** → **orderId**
  - **status** → **priority**

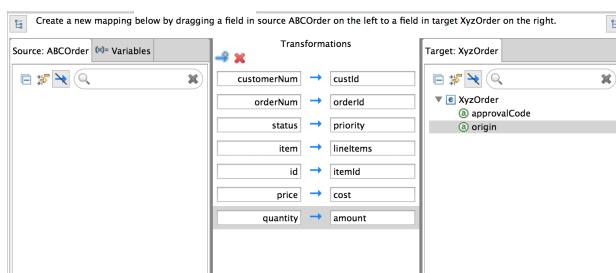
- **item** → **lineItems**
- **id** → **itemId**
- **price** → **cost**
- **quantity** → **amount**



**Figure 7. Map input and output fields**

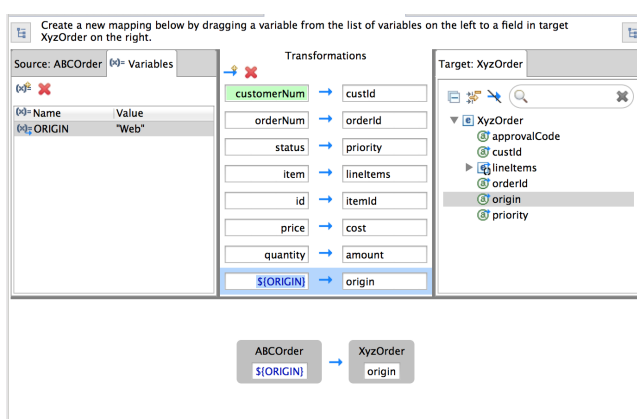
11. Filter the mapped fields on the input and output schema by clicking the  icon.

- A view with only the unmapped fields appears.
- On the output schema, **approvalCode** and **origin** are unmapped.



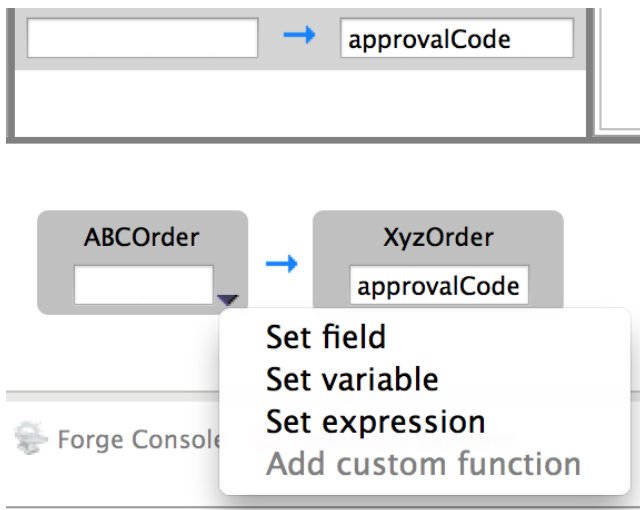
**Figure 8. Unmapped fields**

12. The **origin** field is mapped to a variable. Create a variable **\$ORIGIN** and set its value to **Web**.



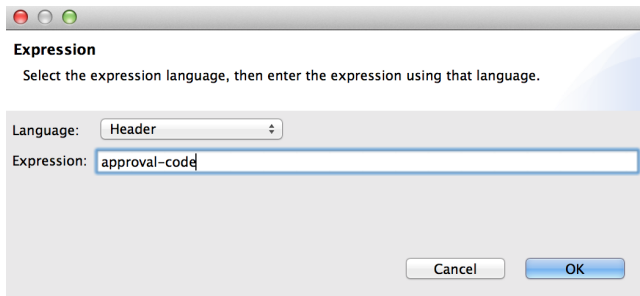
**Figure 9. Map to a variable**

13. The **approvalCode** field is set using an expression mapping that refers to a message header or an exchange property. Create a new mapping by clicking the **new mapping** button. Drag the **approvalCode** field from the output schema to the mapping. For the source, go the detail view and, in the input, select **Set expression** from the drop-down menu.



**Figure 10. Use an expression mapping**

14. On the screen that appears, select **Header** as the **Language** and enter **approval-code** as the expression.

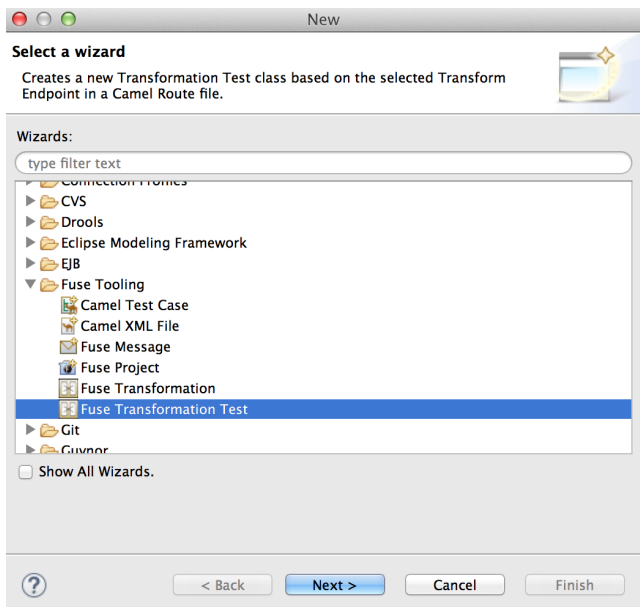


**Figure 11. Expression mapping options**

### 3. Create a Transformation Test to Verify Mapping

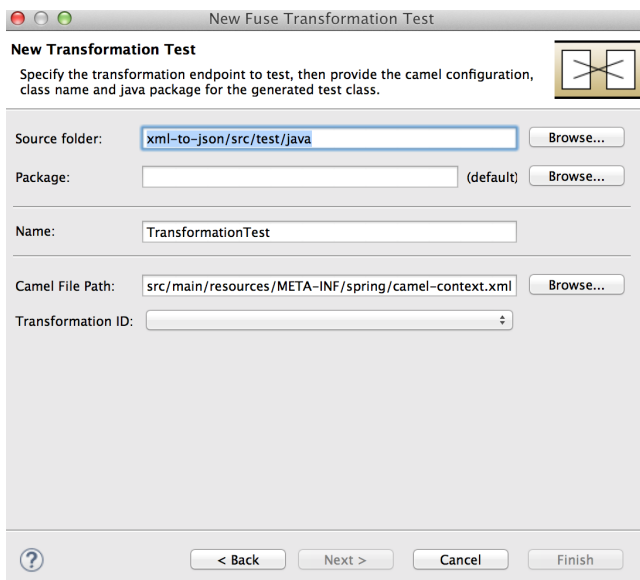
Here you create a new transformation test to verify that the mapping works.

1. In JBoss Developer Studio, click **File** → **New** → **Other**.
2. Select **Fuse Tooling** → **Fuse Transformation Test**.



## Figure 12. Select a wizard

3. Enter the package name and select the transformation ID you created previously.



New Fuse Transformation Test

Specify the transformation endpoint to test, then provide the camel configuration, class name and java package for the generated test class.

Source folder:  Browse...

Package:  Browse...

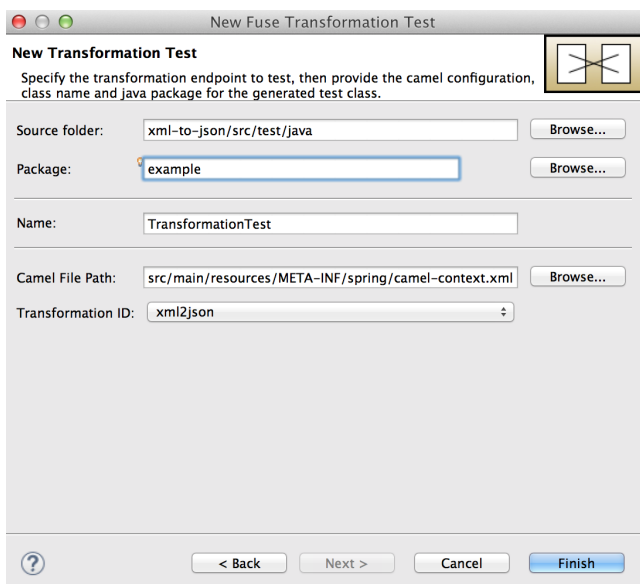
Name:

Camel File Path:  Browse...

Transformation ID:

< Back Next > Cancel Finish

Figure 13. New transformation test



New Fuse Transformation Test

Specify the transformation endpoint to test, then provide the camel configuration, class name and java package for the generated test class.

Source folder:  Browse...

Package:  Browse...

Name:

Camel File Path:  Browse...

Transformation ID:

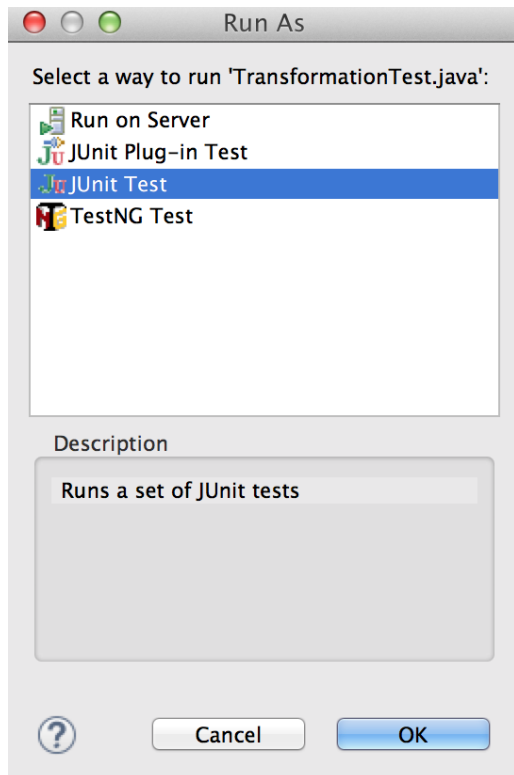
< Back Next > Cancel Finish

Figure 14. New transformation test ID

4. Click **Finish**.
  - This generates code for the transformation test that includes a route that invokes the transformation endpoint.
  - The source for the test is in `src/test/java/example/TransformationTest.java`, which includes a `transform()` method.
5. Add the following code to the method:

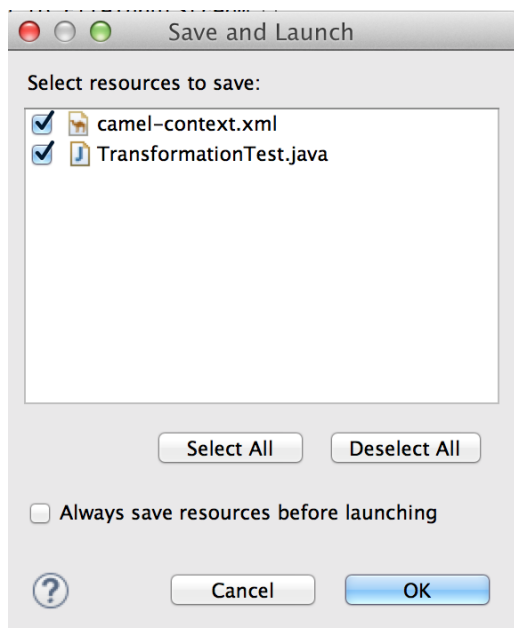
```
startEndpoint.sendBodyAndHeader(readfile("src/data/abc-order.xml"), "approval-code", "AUTO");
```

6. On the **Run As** screen, select **JUnit Test**.



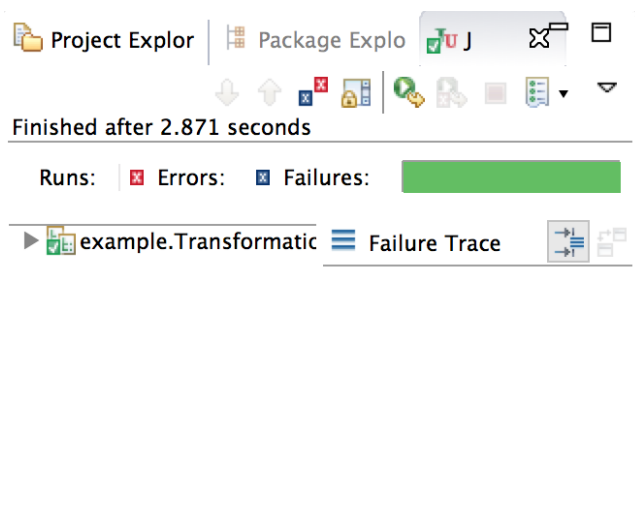
**Figure 15. Run As screen**

7. On the **Save and Launch** screen, check the box for all resources and click **OK**.



**Figure 16. Save and Launch screen**

8. In the **Project Explorer** tab, you should see a green bar indicating success.



**Figure 17. Test success**

- You should see log statements similar to the following:

```
[
    main] TransformationTest          INFO
*****
[
    main] TransformationTest          INFO  Testing:
transform(example.TransformationTest)
[
    main] TransformationTest          INFO
*****
[
    main] DefaultTypeConverter         INFO  Loaded 183
type converters
[
    main] SpringCamelContext           INFO  Apache
Camel 2.15.1 (CamelContext: camel-1) is starting
[
    main] ManagedManagementStrategy    INFO  JMX is
enabled
[
    main] GlobalSettings               INFO  Trying to
find Dozer configuration file: dozer.properties
[
    main] GlobalSettings               WARN  Dozer
configuration file not found: dozer.properties. Using defaults for all Dozer
global properties.
[
    main] DozerComponent               INFO
Configuring GlobalSettings to enable EL
[
    main] DozerInitializer              INFO
Initializing Dozer. Version: 5.5.0, Thread Name: main
[
    main] JMXPlatformImpl              INFO  Dozer JMX
MBean [org.dozer.jmx:type=DozerStatisticsController] auto registered with the
Platform MBean Server
[
    main] JMXPlatformImpl              INFO  Dozer JMX
MBean [org.dozer.jmx:type=DozerAdminController] auto registered with the
Platform MBean Server
[
    main] DozerBeanMapper              INFO
Initializing a new instance of dozer bean mapper.
[
    main] DozerEndpoint                INFO  Loading
Dozer mapping file transformation.xml.
[
    main] SpringCamelContext           INFO
AllowUseOriginalMessage is enabled. If access to the original message is not
needed, then its recommended to turn this option off as it may improve
performance.
[
    main] SpringCamelContext           INFO
```



```

StreamCaching is not in use. If using streams then its recommended to enable
stream caching. See more details at http://camel.apache.org/stream-caching.html
[           main] FileEndpoint                               INFO  Endpoint
is configured with noop=true so forcing endpoint to be idempotent as well
[           main] FileEndpoint                               INFO  Using
default memory based idempotent repository with cache max size: 1000
[           main] SpringCamelContext                         INFO  Route:
route1 started and consuming from: Endpoint[file://src/data?fileName=abc-
order.xml&noop=true]
[           main] SpringCamelContext                         INFO  Route:
route2 started and consuming from: Endpoint[direct://xml2json-test-input]
[           main] SpringCamelContext                         INFO  Total 2
routes, of which 2 is started.
[           main] SpringCamelContext                         INFO  Apache
Camel 2.15.1 (CamelContext: camel-1) started in 0.446 seconds
[           main] route2                                     INFO  Before
transformation:
<?xml version="1.0" encoding="UTF-8"?>
<ABCOrder xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:java="http://java.sun.com">
  <header>
    <status>GOLD</status>
    <customer-num>ACME-123</customer-num>
    <order-num>ORDER1</order-num>
  </header>
  <order-items>
    <item id="PICKLE">
      <price>2.25</price>
      <quantity>1000</quantity>
    </item>
    <item id="BANANA">
      <price>1.25</price>
      <quantity>400</quantity>
    </item>
  </order-items>
</ABCOrder>
[           main] JaxbDataFormat                             INFO  Creating
JAXBContext with contextPath: abcorder and ApplicationContextClassLoader:
sun.misc.Launcher$AppClassLoader@77fe0d66
[           main] StaxConverter                             INFO  Created
XMLInputFactory: com.sun.xml.internal.stream.XMLInputFactoryImpl@3063adc4.
DOMSource/DOMResult may have issues with
com.sun.xml.internal.stream.XMLInputFactoryImpl@3063adc4. We suggest using
Woodstox.
[           main] JacksonDataFormat                         INFO
Registering module:
com.fasterxml.jackson.module.jaxb.JaxbAnnotationModule@1497a91e
[           main] route2                                     INFO  After
transformation:
{"custId":["ACME-
123"],"priority":"GOLD","orderId":"ORDER1","origin":"Web","lineItems":
[{"itemId":"PICKLE","amount":1000,"cost":2.25},
{"itemId":"BANANA","amount":400,"cost":1.25}]}

```

```

[main] TransformationTest INFO
*****
[main] TransformationTest INFO Testing
done: transform(example.TransformationTest)
[main] TransformationTest INFO Took:
0.290 seconds (290 millis)
[main] TransformationTest INFO
*****
[main] SpringCamelContext INFO Apache
Camel 2.15.1 (CamelContext: camel-1) is shutting down
[main] DefaultShutdownStrategy INFO Starting
to graceful shutdown 2 routes (timeout 10 seconds)
[el-1) thread #1 - ShutdownTask] DefaultShutdownStrategy INFO Route:
route2 shutdown complete, was consuming from: Endpoint[direct://xml2json-test-
input]
[el-1) thread #1 - ShutdownTask] DefaultShutdownStrategy INFO Route:
route1 shutdown complete, was consuming from: Endpoint[file://src/data?
fileName=abc-order.xml&noop=true]
[main] DefaultShutdownStrategy INFO Graceful
shutdown of 2 routes completed in 0 seconds
[main] SpringCamelContext INFO Apache
Camel 2.15.1 (CamelContext: camel-1) uptime 0.756 seconds
[main] SpringCamelContext INFO Apache
Camel 2.15.1 (CamelContext: camel-1) is shutdown in 0.008 seconds

```

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