CREATING REST APIS WITH RED HAT FUSE AND 3SCALE

Workshop for getting started with Apache Camel

Mary Cochran
Senior Middleware Consultant

Claus Ibsen
Senior Principal Software Engineer

Wednesday May 9, 2018

What is Camel?

System Integration

Figure 1.1 Camel is the glue between disparate systems.

Integration Framework

APACHE Camel

PATTERN BASED INTEGRATION

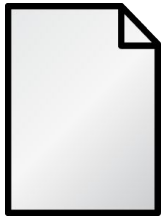
Apache Camel, a powerful pattern-based integration engine with a comprehensive set of connectors and data formats to tackle any integration problem.

ENTERPRISE INTEGRATION PATTERNS

Build integrations using enterprise best practices.

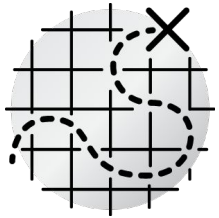
200+ COMPONENTS

Batch, messaging, web services, cloud, APIs, and more ...



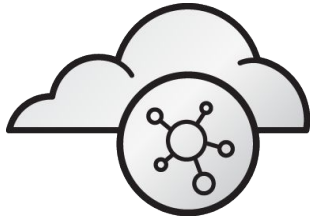
BUILT-IN DATA TRANSFORMATION

JSON, XML, HL7, YAML, SOAP, Java, CSV, and more ...



INTUITIVE ROUTING

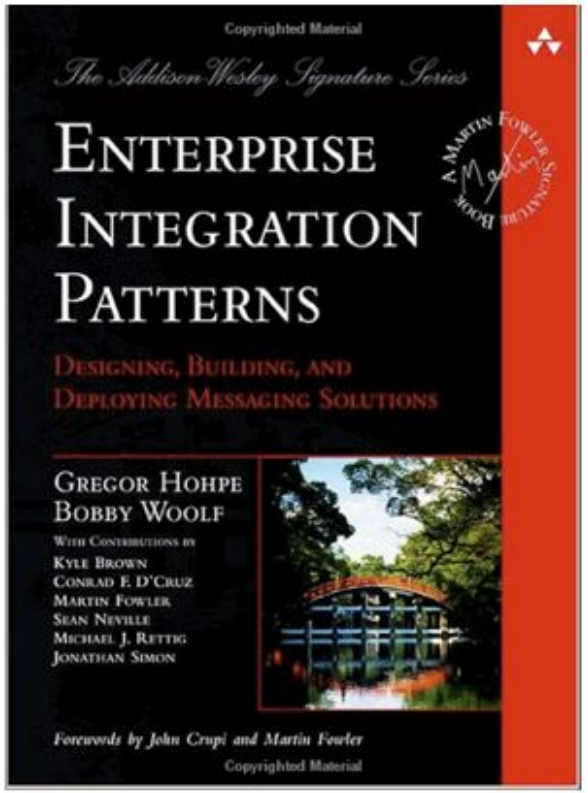
Develop integrations quickly in Java or XML.



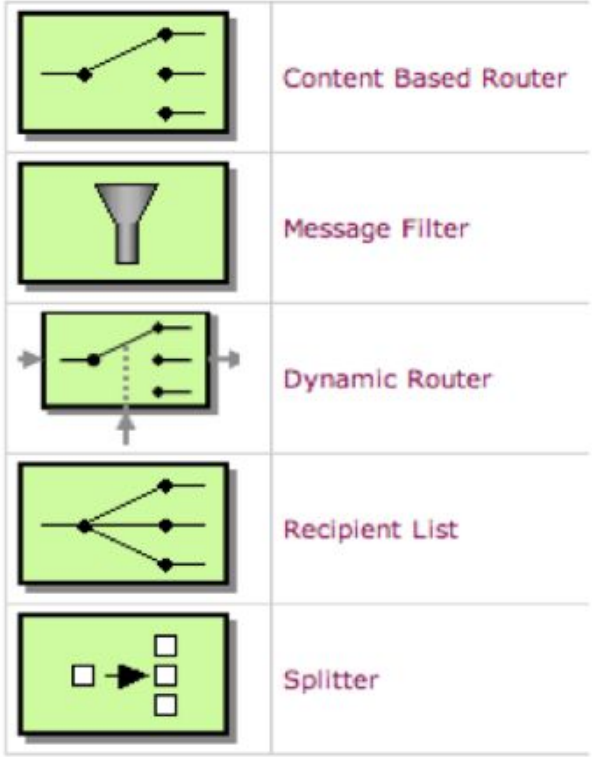
NATIVE REST SUPPORT

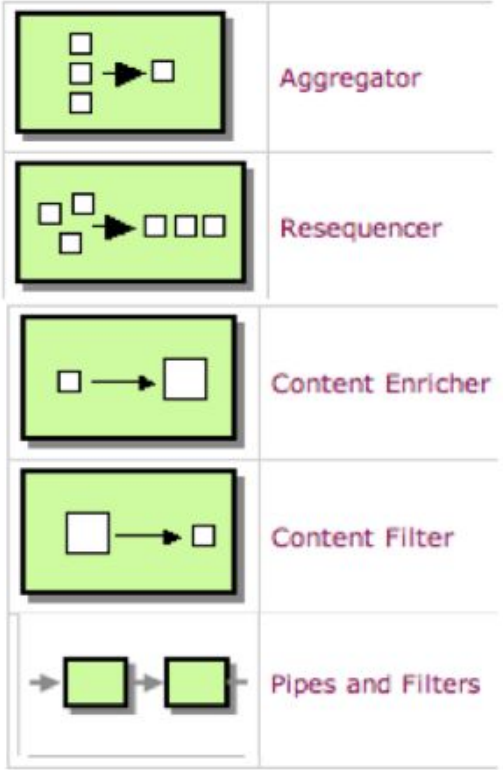
Create, connect, and compose APIs with ease.

Enterprise Integration Patterns

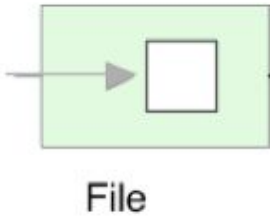


Enterprise Integration Patterns

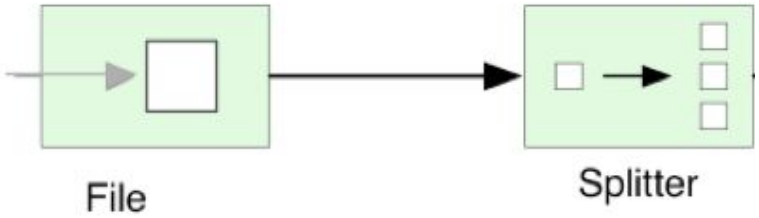




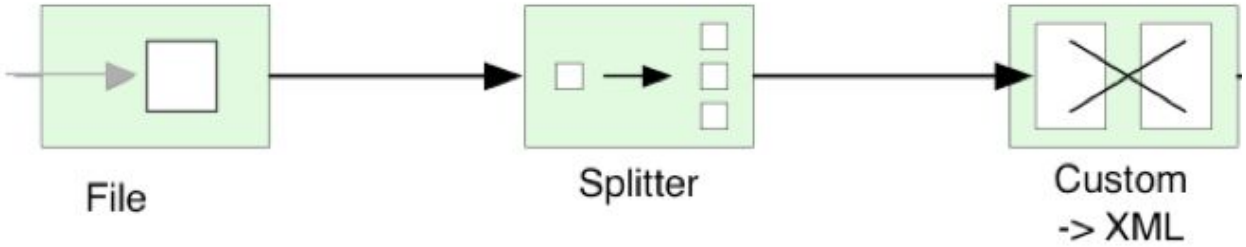
Camel Routes with Splitter



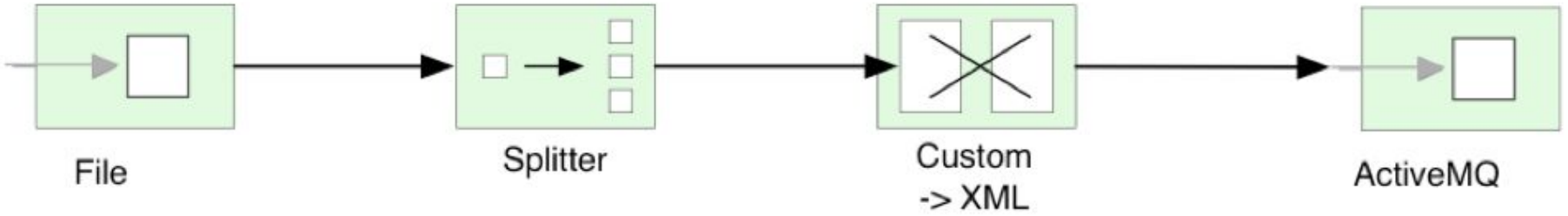
Camel Routes with Splitter



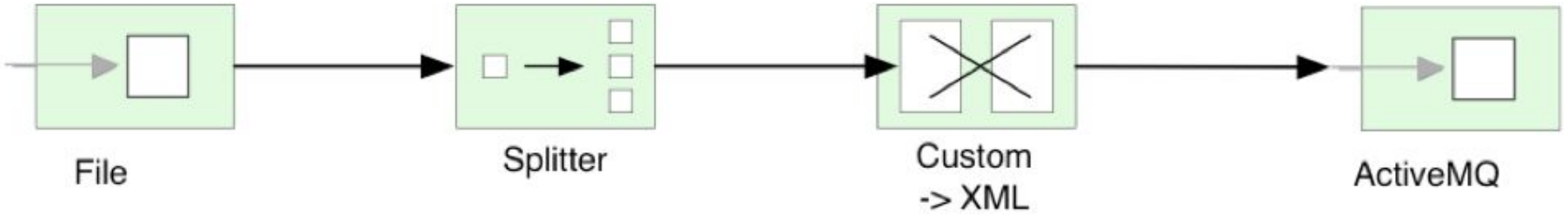
Camel Routes with Splitter



Camel Routes with Splitter

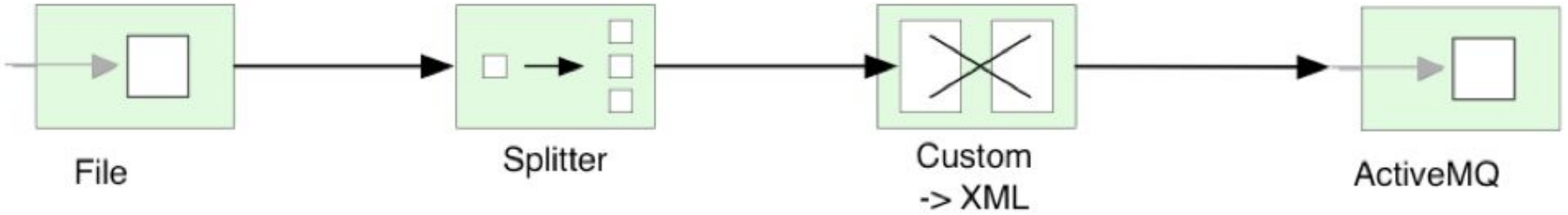


Camel Routes with Splitter



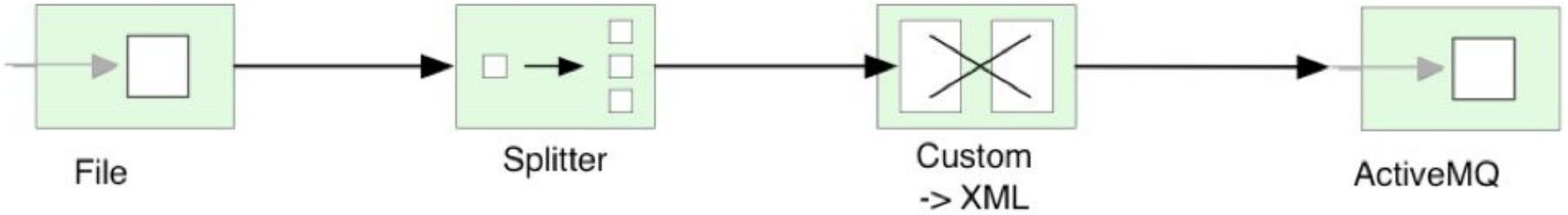

```
from("file:inbox")
```

Camel Routes with Splitter




```
from("file:inbox")
    .split(body().tokenize("\n"))
```

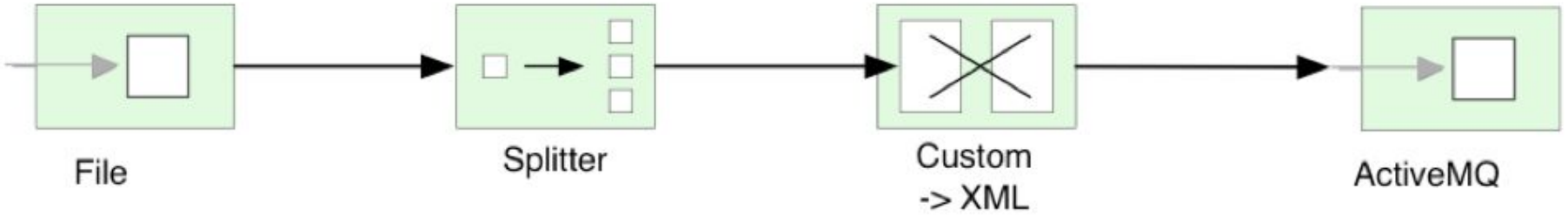
Camel Routes with Splitter




```
from("file:inbox")
    .split(body().tokenize("\n"))
        .marshal(customToXml)
```

Custom data transformation

Camel Routes with Splitter




```
from("file:inbox")
    .split(body().tokenize("\n"))
        .marshal(customToXml)
        .to("activemq:line");
```

Custom data transformation

Camel Routes with Splitter

```
from("file:inbox")
    .split(body().tokenize("\n"))
        .marshal(customToXml)
        .to("activemq:line");
```

Camel Route in Java DSL

```
public void configure() throws Exception {

   from("file:inbox")
      .split(body().tokenize("\n"))
        .marshal(customToXml)
        .to("activemq:line");
}
```

Camel Route in Java DSL

```
public class MyRoute extends RouteBuilder {

  public void configure() throws Exception {

    from("file:inbox")
      .split(body().tokenize("\n"))
        .marshal(customToXml)
        .to("activemq:line");
  }
}
```

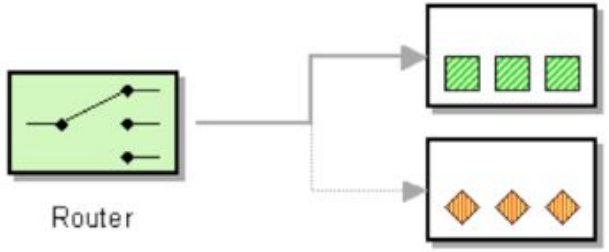
```
import org.apache.camel.builder.RouteBuilder;

public class MyRoute extends RouteBuilder {

  public void configure() throws Exception {

    from("file:inbox")
      .split(body().tokenize("\n"))
        .marshal(customToXml)
        .to("activemq:line");
  }
}
```

Camel Routes



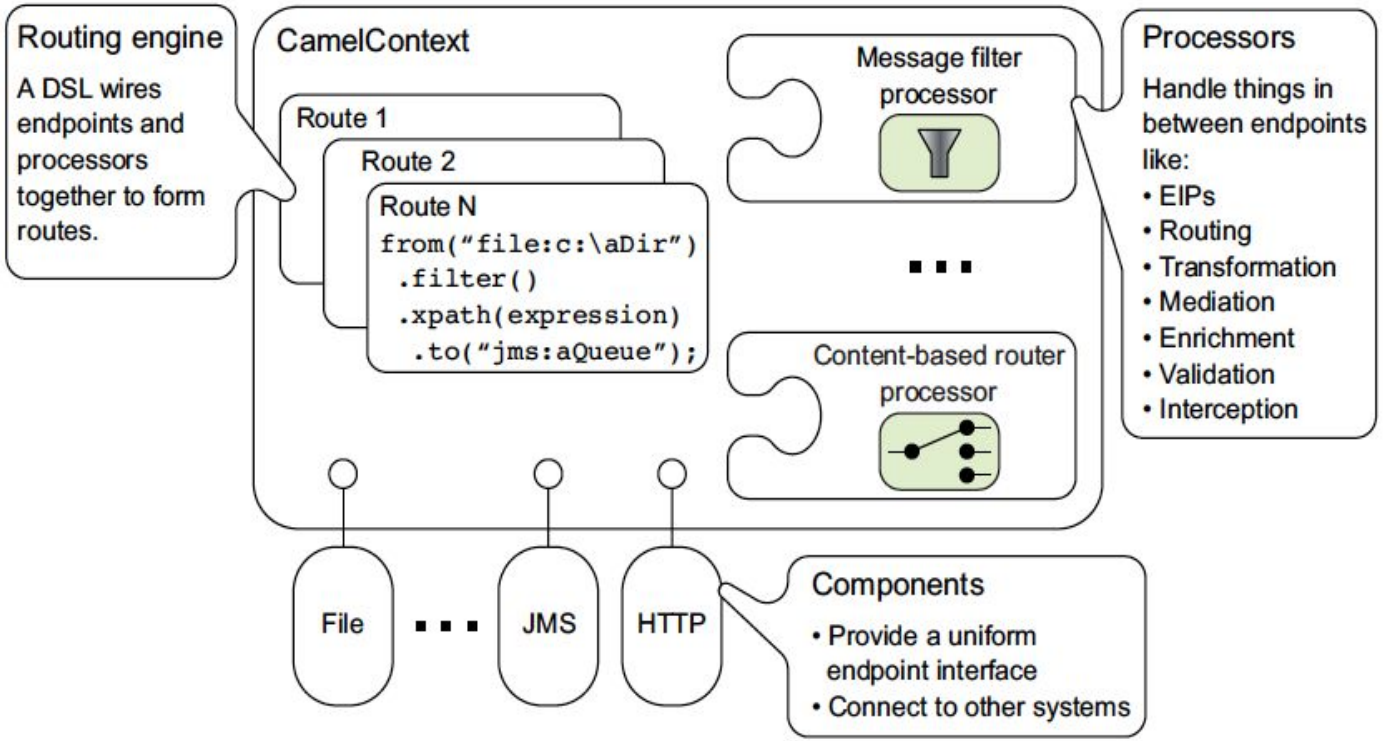

```
from("file:data/inbox")
   .to("jms:queue:order");
```

Java DSL

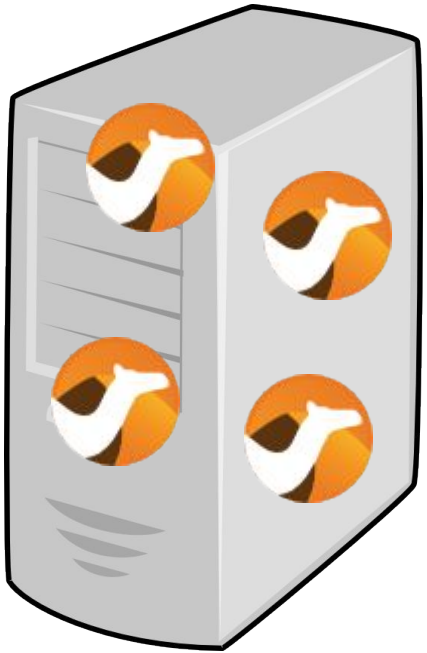
XML DSL

```
<route>
   <from ri="file:data/inbox"/>
   <to uri="jms:queue:order"/>
</route>
```

Camel Architecture



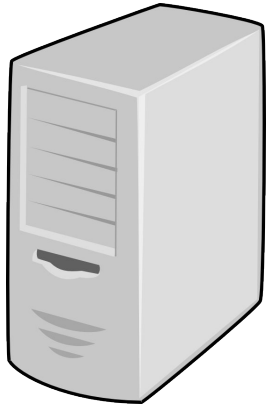
Camel runs everywhere



Application
Servers

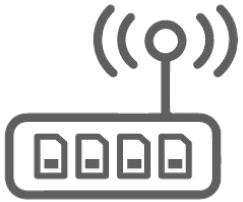
Linux
Containers

Camel connects everything



Enterprise Systems

- File
- FTP
- JMS
- AMQP
- JDBC
- SQL
- TCP/UDP
- Mail
- HDFS
- JPA
- MongoDB
- Kafka
- ...



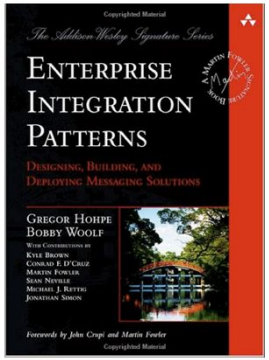
IoT

- CoAP
- MQTT
- PubNub

- AWS
  - S3
  - SQS
  - Kinesis
  - ...
- Google
  - BigQuery
  - PubSub
- Azure
  - Blob
  - Queue

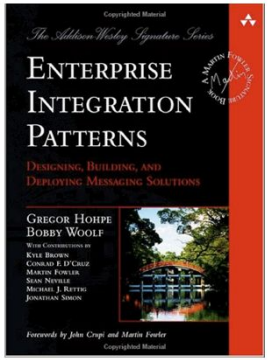
- Box
- Dropbox
- Facebook
- Linkedin
- Salesforce
- SAP
- ServiceNow

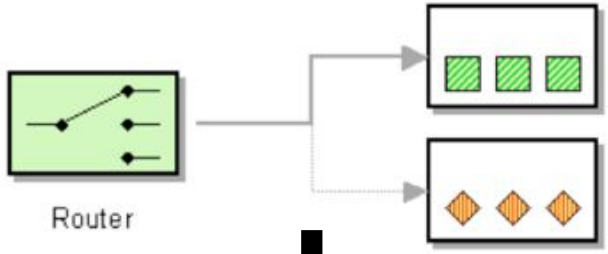

TOOL BOX


Copyrighted Material
The Addison Wesley Signature Series
Enterprise Integration Patterns
Designing, Building, and Deploying Messaging Solutions
Gregor Hohpe
Bobby Woolf
With Contributions by
Kyle Brown
Conrad F. D'Cruz
Martin Fowler
Sean Neville
Michael J. Rettig
Jonathan Simon
Forewords by John Crupi and Martin Fowler
Copyrighted Material

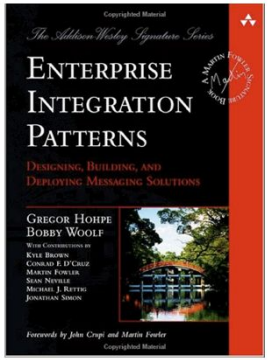
+

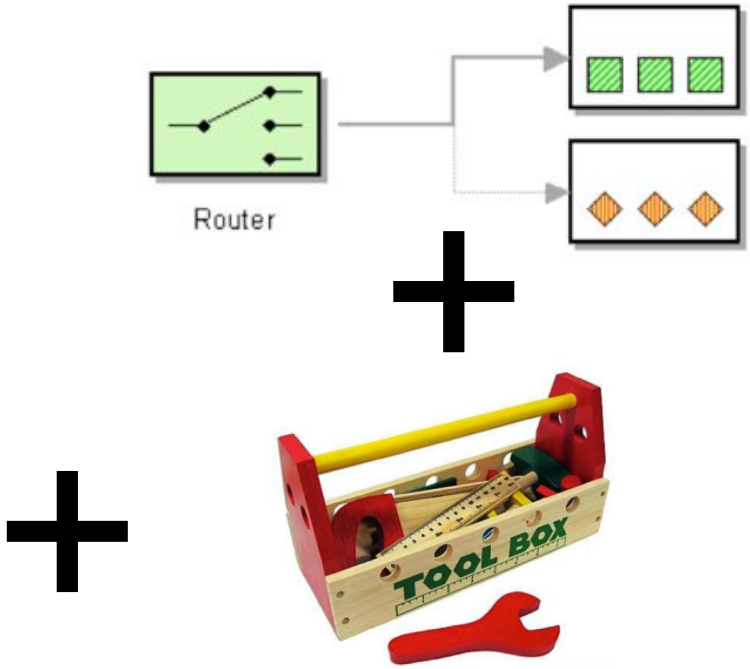

TOOL BOX

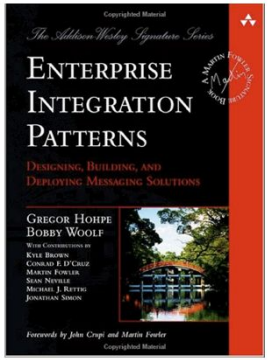

Copyrighted Material
The Addison Wesley Signature Series
Enterprise Integration Patterns
Designing, Building, and Deploying Messaging Solutions
Gregor Hohpe
Bobby Woolf
With Contributions by
Kyle Brown
Conrad F. D'Cruz
Martin Fowler
Sean Neville
Michael J. Rettig
Jonathan Simon
Foreword by John Crupi and Martin Fowler
Copyrighted Material


Router

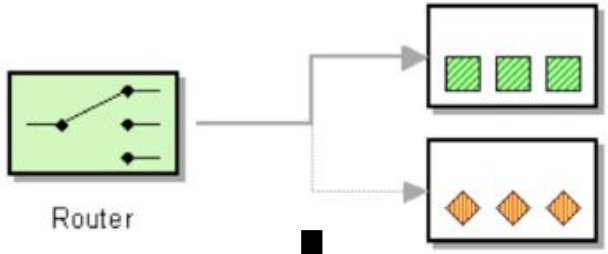

TOOL BOX


Copyrighted Material
The Addison Wesley Signature Series
Enterprise Integration Patterns
Designing, Building, and Deploying Messaging Solutions
Gregor Hohpe
Bobby Woolf
With Contributions by
Kyle Brown
Conrad F. D'Cruz
Martin Fowler
Sean Neville
Michael J. Rettig
Jonathan Simon
Foreword by John Crupi and Martin Fowler
Copyrighted Material


Router
TOOL BOX
File
JMS
HTTP


Copyrighted Material
The Addison Wesley Signature Series
Enterprise Integration Patterns
Designing, Building, and Deploying Messaging Solutions
Gregor Hohpe
Bobby Woolf
With Contributions by
Kyle Brown
Conrad F. D'Cruz
Martin Fowler
Sean Neville
Michael J. Rettig
Jonathan Simon
Foreword by John Crupi and Martin Fowler
Copyrighted Material

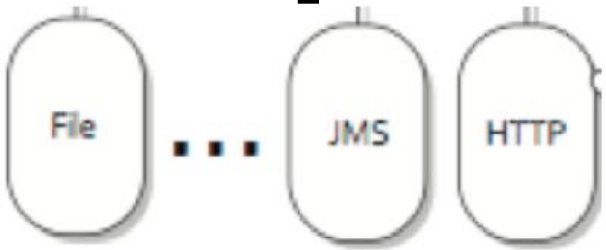
+


Router

+

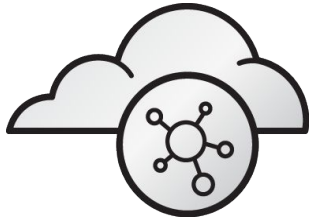

TOOL BOX

+


File
JMS
HTTP

=

What is Camel Rest DSL?



NATIVE REST SUPPORT

Create, connect,
and compose APIs
with ease.

Rest DSL

Server

- Hosting RESTful APIs
- Declared using Rest DSL
- API Swagger Docs

Client

- Invoke remote APIs

Tooling

- Swagger Doc →
  Rest DSL generator

Rest DSL Server

- Uses REST verbs
  - GET
  - POST
  - PUT
- URI templating
  - GET /order/{id}
  - PUT /order
- Configuration
  - Camel Component
  - Context-Path
  - Port
  - CORS
  - ...

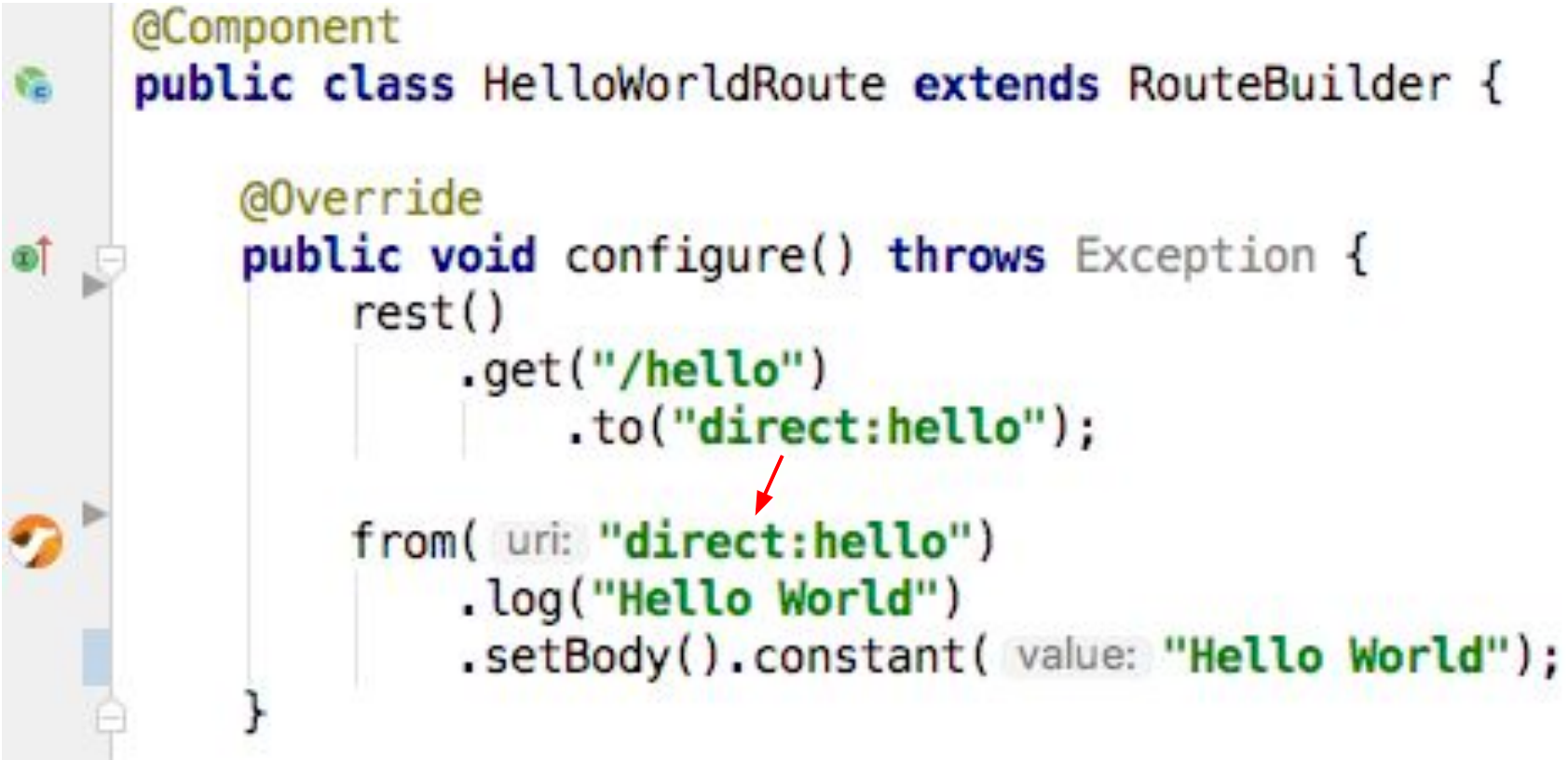
Rest DSL Hello World Example

```
@Component
public class HelloWorldRoute extends RouteBuilder {

    @Override
    public void configure() throws Exception {
        rest()
            .get("/hello")
                .route()
                    .setBody().constant( value: "Hello World");
    }

}
```

Rest DSL Hello World Example



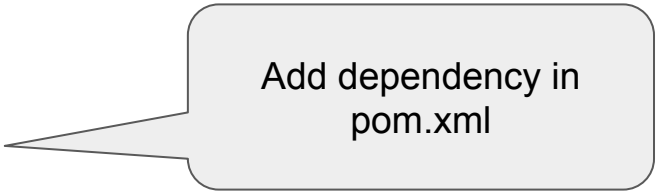
Hello World JSon Example

1. Add JSon libraries (camel-jackson)
2. Configure Rest DSL in JSon mode
3. POJO with JSon model (response)
4. Build response POJO in Rest DSL

Hello World JSon Example

1. Add JSon libraries (camel-jackson)

```
<dependency>
  <groupId>org.apache.camel</groupId>
  <artifactId>camel-jackson-starter</artifactId>
</dependency>
```



Hello World JSon Example

2. Configure Rest DSL in JSon mode

```
@Component
public class HelloWorldRoute extends RouteBuilder {

    @Override
    public void configure() throws Exception {

        // configures rest-dsl to use servlet component and in JSon mode
        restConfiguration()
            .component("servlet")
            .bindingMode(RestBindingMode.json);
```

Turn on JSon binding mode (POJO ←→ JSon)

Hello World JSon Example

3. POJO with JSon model (response)

```
public class ResponseObject {

    private String response;
    private String name;

    public String getResponse() { return response; }

    public void setResponse(String response) { this.response = response; }

    public String getName() { return name; }

    public void setName(String name) { this.name = name; }

}
```

POJO class with getter/setters

Hello World JSon Example

4. Build response POJO in Rest DSL

```
    // route called from REST service that builds a response message
    from( uri: "direct:hello")
        .log("Hello World")
        .bean( bean: this,  method: "createResponse");
}

/**
 * Method that creates a POJO with the response
 */
public ResponseObject createResponse() {
    ResponseObject response = new ResponseObject();
    response.setResponse("Hello World");
    response.setName("your name");
    return response;
}
```

What is 3Scale?

What is 3Scale?

- API Management
- Access Control, Rate Limiting, Analytics
- Developer Workflows
- API Traffic control

The Workshop

PreReqs

- Maven
- Git
- JDK
- Red Hat Developer Account
  - https://developers.redhat.com/auth/realms/rhd/protocol/openid-connect/registrations?client_id=web&redirect_uri=https%3A%2F%2Fdevelopers.redhat.com%2F%2Fconfirmation&state=2fcb17ca-3295-44eb-88d3-6c89851f1753&nonce=6aca0b15-7b68-42e0-858a-ad27f5c65983&response_mode=fragment&response_type=code&scope=openid
- Free Trial Account with 3Scale
  - https://www.3scale.net/signup/
- Text Editor or IDE of your choice
  - Screenshots and any directions will be based on JBoss Developer Studio

High Level Workshop Steps

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab

- Create Your OpenShift Online Account and Download the OC tools
- Download the project base from Github
- Write your camel route
- Run it standalone using spring-boot to ensure you route is working
- Deploy to OpenShift
- Manage with 3Scale
- Play Your API and 3Scale
- BONUS: Setup Swagger

OpenShift Online Registration and OC Tools

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab/tree/master/00-create-openshift-online-account

- https://www.openshift.com/features/index.html
- Select sign up for free
- Select ‘Add a New Plan’, Free Plan
- Wait for email
- Install oc utils from here or by going to about section in web console:
  - https://access.redhat.com/downloads/content/293/ver=3.3/rhel---7/3.3/x86_64/product-software
  - https://console.starter-ca-central-1.openshift.com/console/command-line
  - Download the appropriate ‘oc’ tool for your operating system

Download the Project Base from GitHub

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab/tree/master/summit-example

Writing Your Camel Route

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab/tree/master/01-create-camel-route

1. Create new class called ‘MyRoute’ in package my.project.route
2. Annotate the class with @Component
3. Make the class extend the RouteBuilder class
4. Implement the configure method with your Rest DSL route

Run Standalone Spring Boot App

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab/tree/master/01-create-camel-route

1. Run your Camel route using standalone spring-boot to ensure you route is working
   a. mvn spring-boot:run

2. Hit your Camel Rest Endpoint to Ensure it works
   a. http://localhost:8080/camel/hello

Deploy Your Route to OpenShift

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab/tree/master/02-deploy-to-openshift

- Deploy to openshift online
  - Click link to go to OpenShift Management Console
  - Upper right hand corner <copy login command>
- Go to terminal window
  - Paste the copied oc login command
  - Browse to Camel project
  - Run ‘mvn fabric8:deploy’

Manage Your API with 3Scale

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab/tree/master/03-manage-with-3scale

1. Create your free 3Scale Account if you have not already
   a. https://www.3scale.net/signup/
2. Create a Developer and a Service
3. Create an Application Plan
4. Assign Application Plan to Developer to Create an Application
5. Define and test you API
   a. curl "https://mary-test-summit-2445582096281.staging.gw.apicast.io:443/camel/hello?user_key=88a33411066fbccaa723b738fccb5f65a183951b7045a8b73c5331bf6e0e0038"

Play Your API and 3Scale

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab/tree/master/03-manage-with-3scale

Options:

- Add Rate Limits to your hello_World method
- Set up Alerts
- View Analytics
- Set up a Developer Portal

BONUS: Setup Swagger

https://github.com/mmistretta/RHSummit2018Camel3ScaleLab/tree/master/04-swagger-docs

- Add Swagger docs to Camel Route
- Display Swagger docs in Developer Portal

HELPFUL LINKS

https://docs.openshift.com/online/getting_started/beyond_the_basics.html#getting-started-beyond-the-basics

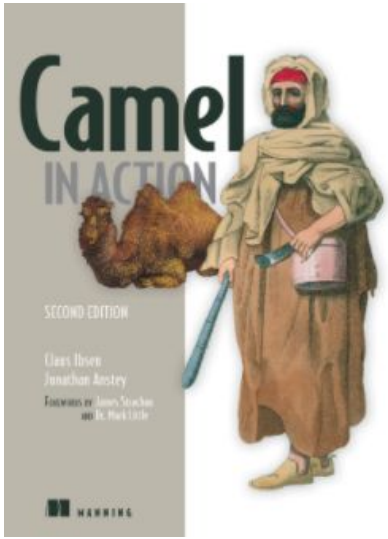
https://access.redhat.com/documentation/en-us/red_hat_3scale/2.1/html/quickstart/quickstart

Not so free book

- Discount code (39%):

  `camel139`

  (ordering from Manning)



https://www.manning.com/books/camel-in-action-second-edition

THANK YOU


plus.google.com/+RedHat


facebook.com/redhatinc


linkedin.com/company/red-hat


twitter.com/RedHat


youtube.com/user/RedHatVideos