ENTERPRISE DEVELOPMENT SERVICES DIRECT FROM THE CREATORS OF SPRING FRAMEWORK

INTERFACE21

Rolling out Web Services the Right Way with Spring-WS

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Spring

About me

- Over ten years of experience in Enterprise Software Development
- Three years of Web service experience
- Development lead of Spring Web Services
- Contributor to various Open Source frameworks: (XFire, Axis2, NEO, ...)

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Overview

- Contract-first
- Defining the contract
- Implementing the contract
- Creating a client
- Conclusions

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Contract-first

“Don't talk to me about contracts, Wonka, I use them myself. They're strictly for suckers.”

Willy Wonka & the Chocolate Factory

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What is a Web Service Contract?

- Data Contract
  - Defines Data Types
  - Typically XSD
- Service Contract
  - Defines Operations
  - Typically WSDL
    - WSDL can contain an XSD

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What is Contract-First?

- Define XML Interface
  - Start with XSD and WSDL
- **Best Practice**
  - Solves many interoperability issues
  - Clients don’t care about Java, they care about XML
- Can generate Java from Contract
  - Strong coupling

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Why not Contract-Last?

- Start with Java
  - JSR 181 (**`@WebService`**)
    - “Web service magic pixie dust” – Ted Neward
- WS are not RPC!
- Contract is not IDL!
- WS are more like MQ
  - **XML Messaging**

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Defining the Contract

“It’s all about the XML.”

Ted Neward

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Sample Application

- Airline Application
- Obtain list of Flights
  - Date
  - From Airport
  - To Airport

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Three simple steps

1. Create sample XML message
2. Infer XSD from messages
3. Optional: Create WSDL

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Implementing the Contract

"In general, an implementation must be conservative in its sending behavior, and liberal in its receiving behavior."

Jon Postel

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Endpoints

- XML messages handled by Endpoints
- Endpoints are like MVC’s Controllers:
  - Handle Request
  - Invoke method on Business Service
  - Create Response

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Request

```
<SOAP-ENV:Envelope xmlns:SOAP-ENV=
   'http://schemas.xmlsoap.org/soap/envelope/'
   <SOAP-ENV:Body>
       <GetFlightsRequest xlmns="..." >
          <from>AMS</from>
          <to>MIA</to>
          <departureDate>2006-12-03</departureDate>
       </GetFlightsRequest>

   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

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DOM Endpoint

```
public class GetFlightsEndpoint
    extends AbstractDomPayloadEndpoint {

    protected Element invokeInternal(Element request, Document
    document) {
        Element fromElement =
            (Element)request.getElementsByTagNameNS(
                "...", "from");
        Element toElement = ...

        List flights = service.getFlights(from, to,
            date);

        return createResponse(flights, document);
    }
}
```

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Endpoint APIs

- W3C DOM
- JDOM
- DOM4J
- XOM
- SAX
- Stax

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XML Marshalling

- Marshaller and Unmarshaller interface
- Unified Exception hierarchy
- Support for:
  - JAXB 1 and 2
  - Castor
  - XMLBeans
  - JiBX
  - XStream
- Not tied to Web services

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XML Marshalling

"Serialization is the process of saving an object onto a storage medium either as a series of bytes or in a human-readable (XML) format. Later the series of bytes or XML can be used to re-create an object that is identical to the original object."

Wikipedia

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Object/XML Impedance Mismatch

- XML Schema is richer than Java
- Incompatible naming
- xsd:enumeration
- Unserializable types
- Independent namespaces

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Message Routing

- How to route message to Endpoint?
- Possible options:
  - URL: Spring's **`DispatcherServlet`**
  - Message content
  - SOAPAction
  - WS-Addressing
- In Spring-WS: EndpointMappings

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SOAP Action-based Routing

```
POST  /AirlineService HTTP/1.1
SOAPAction: "GetFlights"

<SOAP-ENV:Envelope>
    <SOAP-ENV:Body>
        <GetFlightsRequest>
```

SoapActionEndpointMapping

- Fast
- Tied to HTTP/Mime

```
</SOAP-ENV:Envelope>
```

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Content-based Routing

```
POST  /AirlineService HTTP/1.1
SOAPAction: "GetFlights"

<SOAP-ENV:Envelope>
    <SOAP-ENV:Body>
        <GetFlightsRequest>
```

PayloadRootEndpointMapping

- Not tied to HTTP
- Slow

```
</SOAP-ENV:Envelope>
```

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EndpointInterceptors

- Invoked before and after Endpoint
- Defined by EndpointMapping
- Provided:
  - PayloadLoggingInterceptor
  - PayloadValidatingInterceptor
  - PayloadTransformingInterceptor
  - WS-Security Interceptor

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PayloadValidatingInterceptor

- Needs a schema
- Validates
  - Request
  - Response
- Remember the quote?
  - "Be conservative in what you send, be liberal in what you receive"

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TransformingInterceptor

- Transforms XML from one format to another
- Based on XSLT
- Useful for supporting old message formats

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WS-Security Interceptor

- Based on XWS-Security
- Offers
  - Authentication
  - Signing
  - Decryption/Encryption
- Acegi integration

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MessageDispatcher

- Central entry-point for WS messages
- Dispatches incoming messages to Endpoints
- Uses EndpointMappings, EndpointAdapters

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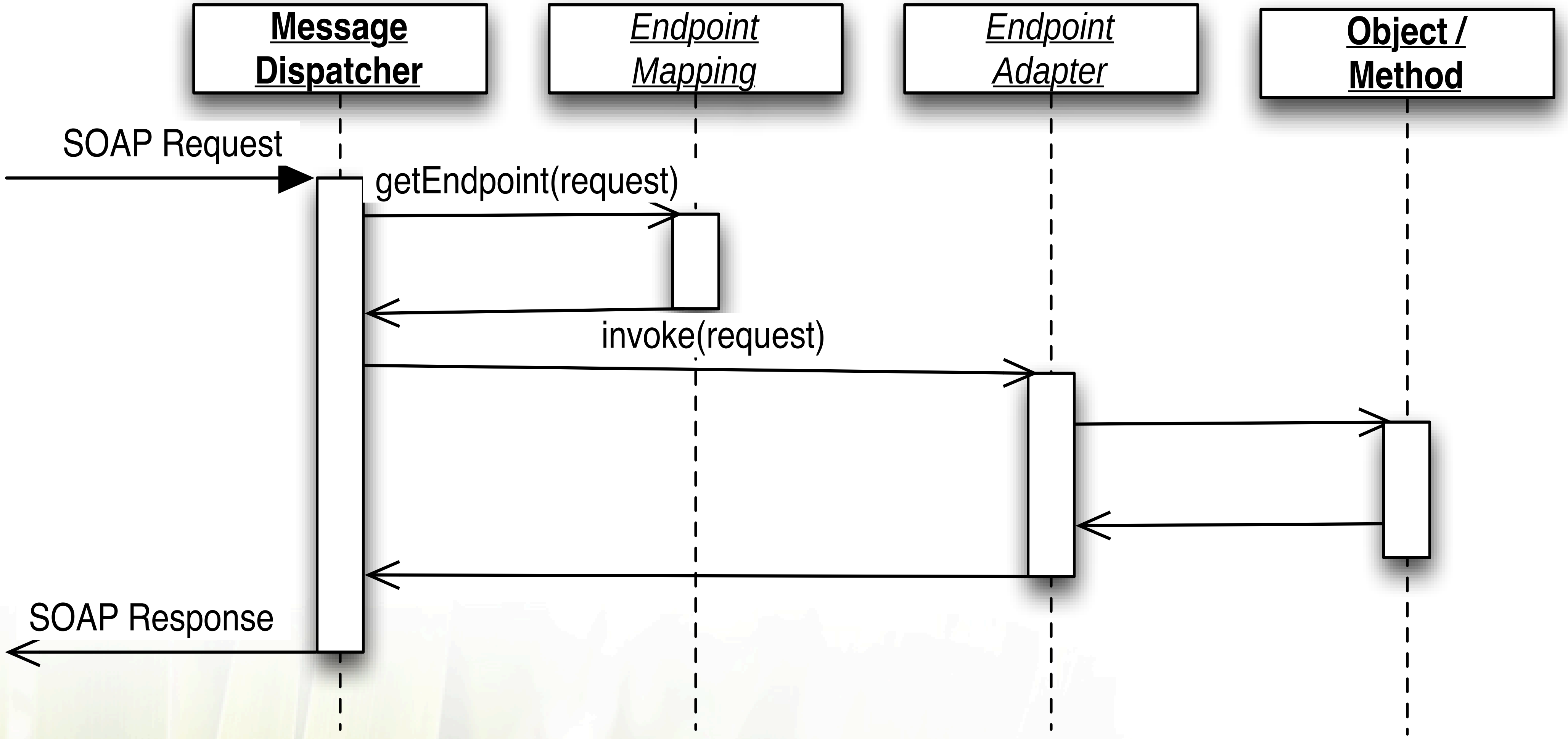
Spring Web Services



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Spring

Conclusions

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Other Features

- Plain Old Xml support (POX)
- Acegi integration with WS-Security
- JMS Support
- Much more...

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Planning

- Current release 1.0 M3
  - Client-side support
- 1.0 Q2 2007

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Q & A

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