

# PublishMQ SPI Implementation

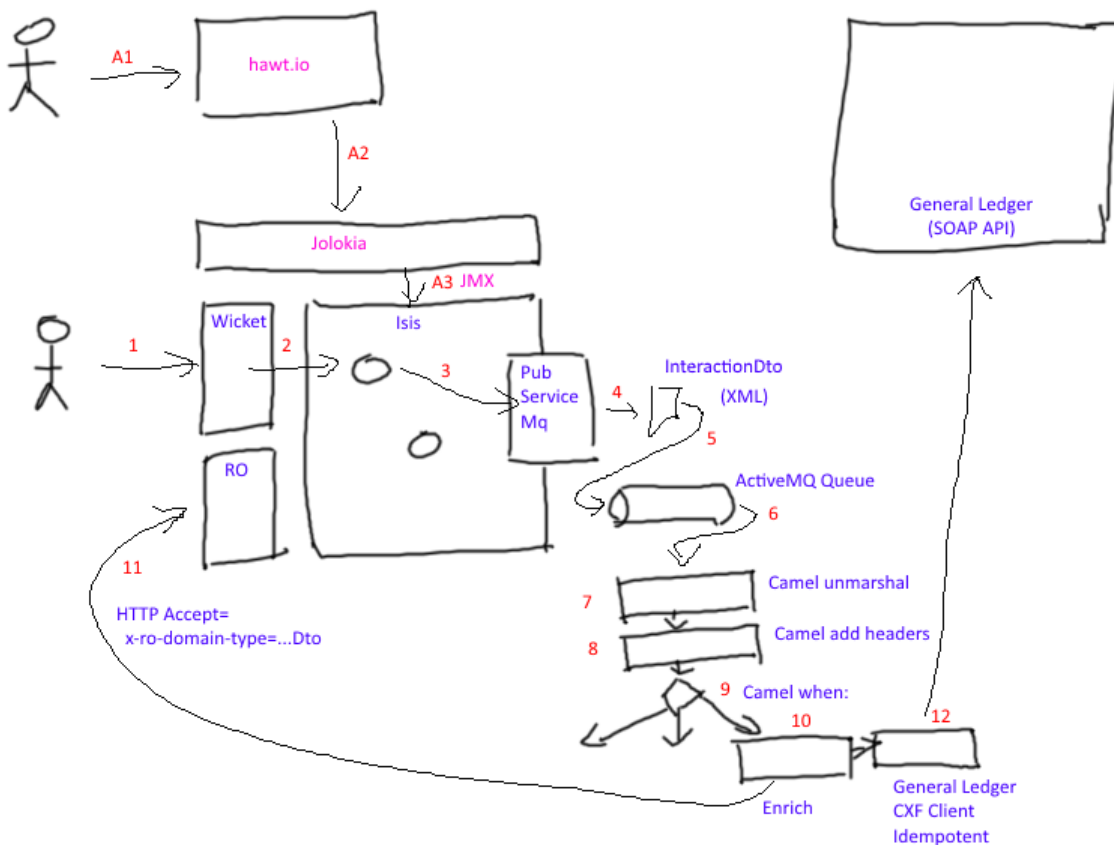
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This module (`isis-module-publishmq`) provides an implementation of Apache Isis' `PublisherService` SPI that submits an XML representation of an `MemberInteractionDtos` to an `ActiveMQ` queue.

The `quickstart` app also demonstrates how this member interaction event (action invocation or property edit) can be routed using `Apache Camel`, whereby the payload is enriched using Apache Isis' own `Restful Objects` viewer (obtaining additional information);

The diagram below shows the moving parts:



One of the design objectives for the PublishMq module is to allow the ActiveMQ queue (and therefore any Camel routing) to be either embedded (as in the example app) or to be remote. This is one of the reasons why the payload posted to the queue is the XML representation of a JAXB object (the `InvocationDto`).

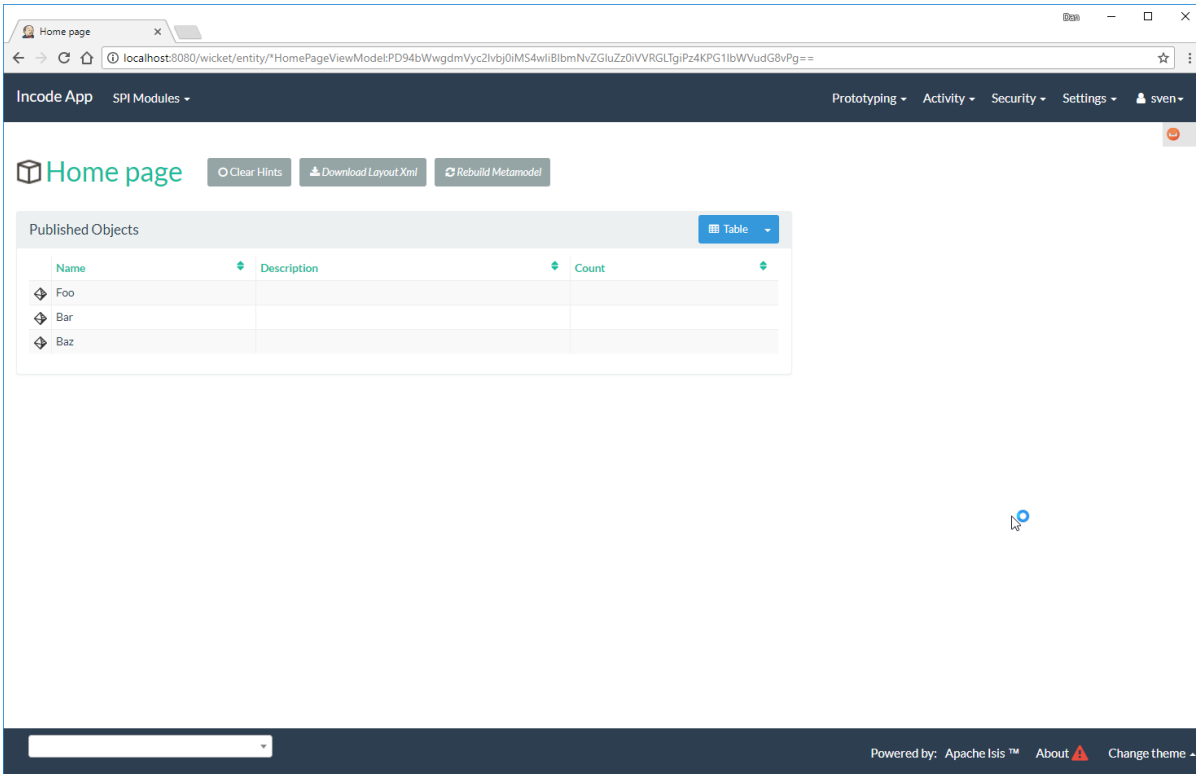


Note that the example app does *not* include an external system (General Ledger in the diagram), ie step #12.

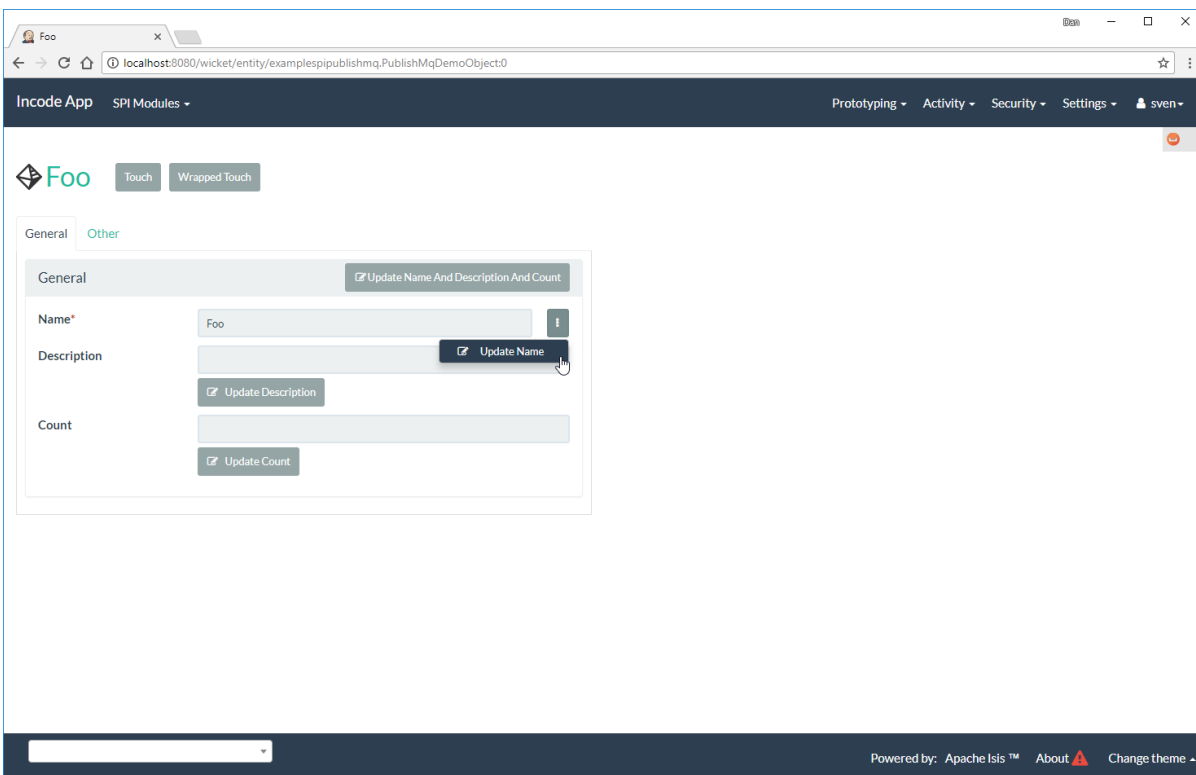
# Screenshots

The module's functionality can be explored by running the [quickstart with example usage](#) using the `org.incode.domainapp.example.app.modules.ExampleDomSpiPublishMqAppManifest`.

A home page is displayed when the app is run:



This returns the first demo object (an instance of `PubLishMqDemoObject`):



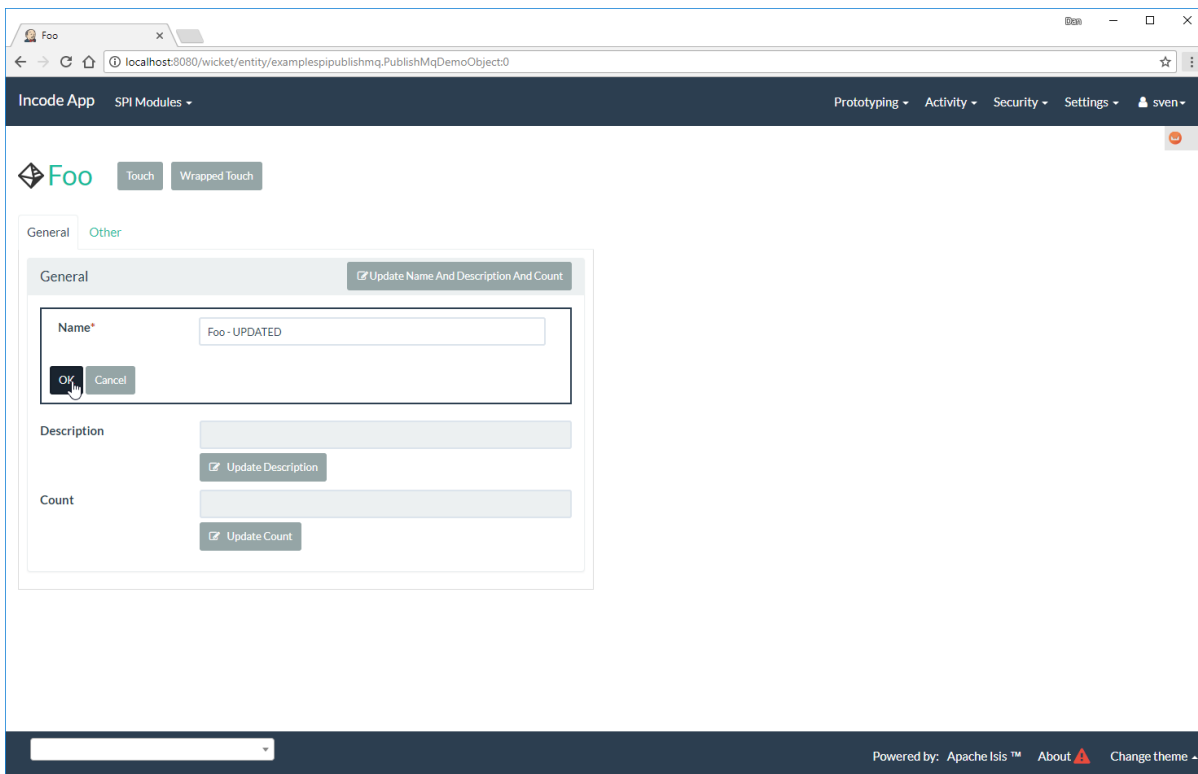
# Invoke an action

The `updateName()` action is defined as:

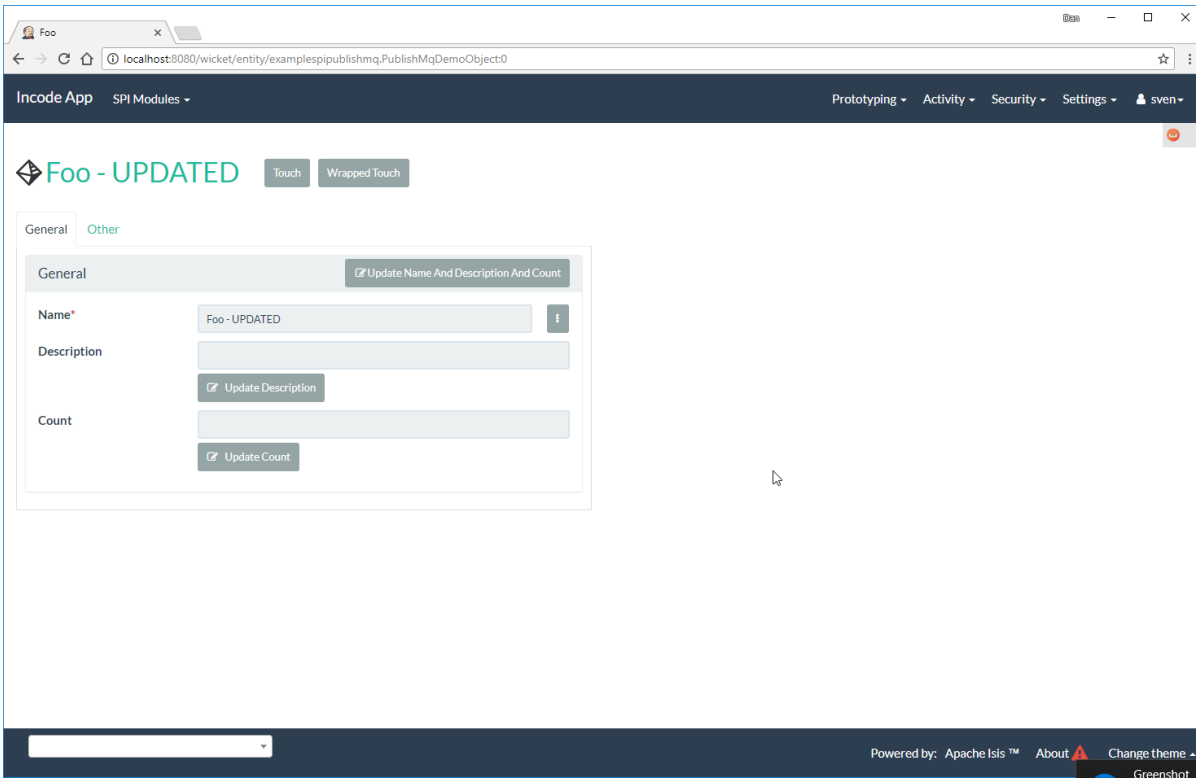
```
@Action(  
    semantics = SemanticsOf.IDEMPOTENT,  
    publishing = Publishing.ENABLED ①  
)  
public PublishMqDemoObject updateName(  
    @ParameterLayout(named="Name") final String name) {  
    setName(name);  
    return this;  
}
```

① invocations of this action will be published to the configured implementation of `PublishingService`.

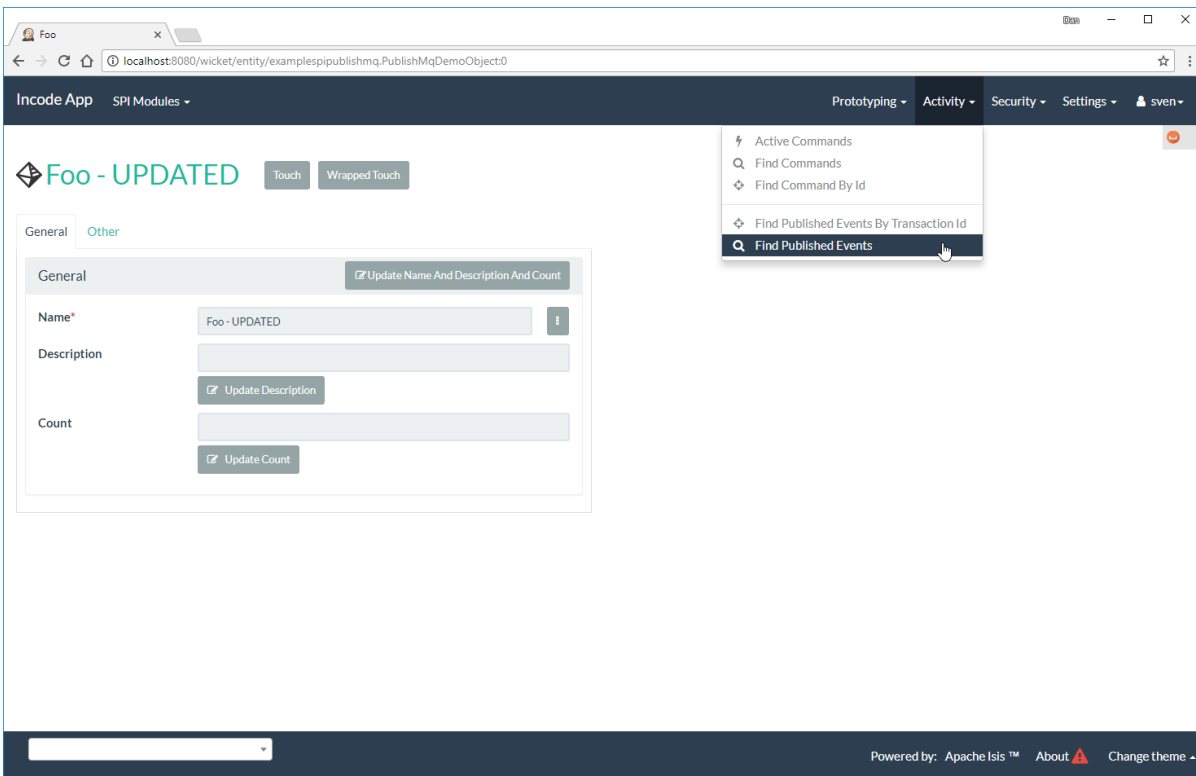
Invoke the action:



the value of the `name` property should, of course, be updated:



From the activity menu the published events (also persisted as entities) can be inspected:



... one of which is to update the name:

Find Published Events

Type	User	Timestamp	Transaction Id	Sequence	Event Type	Class	Action	Property Id	Object	Pre Value	Post Value
	sven	2017-09-09 14:01:30.948	227cd195-5ecf-41fb-be37-a924228f215f	8	Changed Objects						
	sven	2017-09-09 14:01:30.945	227cd195-5ecf-41fb-be37-a924228f215f	7	Changed Objects						
	sven	2017-09-09 14:01:30.674	227cd195-5ecf-41fb-be37-a924228f215f	0	Action Invocation	Publish Mq Demo Object	Update Name		examplesipublishmq.PublishMqDemoObject:0		
	initialisation	2017-09-09 13:54:56.023	58fcc42f-0025-43c3-a321-9153aaf095a5	2	Changed Objects						
	initialisation	2017-09-09 13:54:55.872	58fcc42f-0025-43c3-a321-9153aaf095a5	1	Changed Objects						
	initialisation	2017-09-09 13:54:55.804	58fcc42f-0025-43c3-a321-9153aaf095a5	0	Changed Objects						

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The published entity contains XML which captures the details of the member interaction:

Action Invocation of 'Update Name' on Foo - UPDATED

Recent Events Published By User

**Identifiers** Republish

User\* sven Open Recent Commands By User

Timestamp\* 2017-09-09 14:01:30.674

Transaction Id\* 227cd195-5ecf-41fb-be37-a924228f215f Command

Sequence\* 0

Event Type\* Action Invocation

**Target**

Class Publish Mq Demo Object

Action Update Name

Object examplesipublishmq.PublishMqDemoObject:0 Open

**Detail**

Member Identifier org.incode.domainapp.example.dom.spi.publishmq.dom.demo.PublishMqDemo

Serialized Form

```

updateName|</ix:title>
<ix:metrics>
<ix:ntimings>
<com:startedAt>2017-09-09T14:01:30.674+01:00</com:startedAt>
<com:completedAt>2017-09-09T14:01:30.676+01:00</com:completedAt>
</ix:ntimings>
<ix:nobjectCounts>
<ix:nloaded before="1" after="1"/>
<ix:n dirtied before="0" after="1"/>
</ix:nobjectCounts>
</ix:metrics>
<ix:nparameters>
<cmd:parameter name="Name" type="string" null="false">
<com:string>Foo - UPDATED</com:string>
</cmd:parameter>
</ix:nparameters>
<ix:nreturned type="reference" null="false">
<com:reference type="examplesipublishmq.PublishMqDemoObject" id="0"/>
</ix:nreturned>
</ix:nexecution>
</ix:ninteractionDto>

```

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# How to configure/use

You can either use this module "out-of-the-box", or you can fork this repo and extend to your own requirements.

The module itself consists of several submodules:

- the `publishmq-dom-servicespi` submodule  
which contains the `PublishingService` SPI implementation that actually publishes to an ActiveMQ queue
- the (optional, but recommended) `publishmq-dom-jdo` submodule  
which allows published events to be persisted as `PublishedEvent` entities
- the (optional) `publishmq-dom-camel` submodule  
which provides utility class to help route messages
- the (optional) `publishmq-dom-statusclient`  
that provides utility classes to log status messages with the originating system via the RestfulObjects viewer's REST API.

## Classpath

Update your classpath:

- by adding importing the parent module's dependency into in your parent module's `pom.xml`:

```
<dependencyManagement>
  <dependencies>
    <dependency>
      <groupId>org.isisaddons.module.publishmq</groupId>
      <artifactId>isis-module-publishmq-dom</artifactId>
      <version>${incode-platform.version}</version>
      <type>pom</type>
      <scope>import</scope>
    </dependency>
    ...
  </dependencies>
</dependencyManagement>
```

where `incode-platform.version` property is set appropriately for the version

- by adding the `-dom-servicespi` dependency in your project's `dom` module's `pom.xml`:



```
<dependencies>
  <dependency>
    <groupId>org.isisaddons.module.publishmq</groupId>
    <artifactId>isis-module-publishmq-dom-servicespi</artifactId>
  </dependency>
  ...
</dependencies>
```

- (if you are using Camel for routing and want to use the `AddExchangeHeaders` utility class) by adding (in the appropriate module within your app) the dependency:

```
<dependencies>
  <dependency>
    <groupId>org.isisaddons.module.publishmq</groupId>
    <artifactId>isis-module-publishmq-dom-camel</artifactId>
  </dependency>
  ...
</dependencies>
```



Note that the [quickstart with embedded camel](#) configures this already, so use as a guide if need be.

Check for later releases by searching [Maven Central Repo](#).

## Configuration Properties

In `isis.properties`:

*isis.properties*

```
isis.services.PublisherServiceUsingActiveMq.vmTransportUri=vm://broker
isis.services.PublisherServiceUsingActiveMq.memberInteractionsQueue=memberInteractions
Queue
isis.services.PublisherServiceUsingActiveMq.enabled=true
```

The properties shown above are the defaults.

## Bootstrapping

In the `AppManifest`, update its `getModules()` method, eg:

```

@Override
public List<Class<?>> getModules() {
    return Arrays.asList(
        ...
        org.isisaddons.module.publishmq.PublishMqModule.class,
        ...
    );
}

```

You might also need to specify the package for any new services that you have written, eg implementation of `ContentNegotiationService` or similar.

## Configure ActiveMQ

Configure ActiveMQ so that the publishing service implementation can post to a queue called `memberInteractionsQueue`.

In the [quickstart with embedded camel](#) app this is done using Spring ([activemq-config.xml](#)):

```

<beans
  xmlns="http://www.springframework.org/schema/beans"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.springframework.org/schema/beans
http://www.springframework.org/schema/beans/spring-beans.xsd
http://activemq.apache.org/schema/core
http://activemq.apache.org/schema/core/activemq-core.xsd">
  <broker xmlns="http://activemq.apache.org/schema/core"
    brokerName="broker"
    dataDirectory="{activemq.data}"
    useShutdownHook="false"
    useJmx="true"
  >
    ...
    <destinations>
      <queue physicalName="memberInteractionsQueue"/>
    </destinations>
    ...
  </broker>
</beans>

```

This is bootstrapped in the `web.xml`:

```
<listener>
  <listener-class>org.springframework.web.context.ContextLoaderListener</listener-
class>
</listener>
<context-param>
  <param-name>contextConfigLocation</param-name>
  <param-value>
    classpath:activemq-config.xml
  </param-value>
</context-param>
```

# Canonical DTOs

The [quickstart with embedded camel](#) app contains a few other little tricks that may be useful if you are looking to deploy a similar architecture for your own application.

## Generate Canonical DTO referencing Apache Isis' DTOs

As of 1.13.0 Apache Isis includes the `ixn.xsd` (member interaction) schema (replacing and generalizing the `aim.xsd` provided from 1.9.0 through 1.12.x). The `PublishingServiceMq` uses this `ixn.xsd` schema (or rather, its Java JAXB equivalent, `InteractionDto`), directly.

The similar `common.xsd` is *also* used by the demo app in the construction of its own canonical `DemoObjectDto` (use of `OidDto` to represent a bookmark to a published domain object).

## Centralized Spring configuration

In the example app Spring is used to bootstrap ActiveMQ (`activemq-config.xml`), and Camel (`camel-config.xml`), and also the fake SOAP Subscriber (`externalSystemFakeServer-config.xml`). The configuration for all is centralized through a `propertyPlaceholderConfigurer` bean (defined in `propertyPlaceholderConfigurer-config.xml`). The location of the property file is specified in the `web.xml`:

```
<context-param>
  <param-name>spring.config.file</param-name>
  <param-value>classpath:spring.properties</param-value>
</context-param>
```

where `spring.properties` is:

```
activemq.data=activemq-data
enrichWithCanonicalDto.base=http://localhost:8080/restful/
enrichWithCanonicalDto.username=sven
enrichWithCanonicalDto.password=pass
updateExternalSystemAdapter.endpointAddress=http://localhost:8080/soap/ExternalSystemA
dapter/DemoObject
```

If necessary the location of this config file can be overridden; see [this topic](#) in the Apache Isis user guide.

# Database Migrations

- [#88](#) - add sequence to StatusMessage.

Search for [issue-88-add-sequence-to-StatusMessage-pk.sql](#) in this repo.

- [#89](#) - change order of PublishedEvent pk

Search for [issue-89-change-order-of-PublishedEvent-pk.sql](#) in this repo.

# Known issues

None known at this time.

# Submodules

The `publishmq` module actually consists of four distinct submodules, which can be used to some extent independently.

## `publishmq/servicespi`

Maven can report modules dependencies of this submodule using:

```
mvn dependency:list -o -pl modules/spi/publishmq/impl/servicespi -D
excludeTransitive=true
```

which, excluding Incode Platform and Apache Isis modules, returns these compile/runtime dependencies:

```
org.apache.activemq:activemq-all:jar:5.11.1
```

For further details on 3rd-party dependencies, see:

- [Apache ActiveMQ](#)

## `publishmq/jdo`

This submodule can be considered optional (though its use *is* recommended). If not included then published messages are simply not persisted as JDO entities.

Maven can report modules dependencies of this submodule using:

```
mvn dependency:list -o -pl modules/spi/publishmq/impl/jdo -D excludeTransitive=true
```

which, excluding Incode Platform and Apache Isis modules, returns these compile/runtime dependencies:

```
org.slf4j:slf4j-api:jar:1.7.21
```

From the Incode Platform it uses:

- `publishmq/servicespi` submodule, above.

For further details on 3rd-party dependencies, see:

- [Slf4j](#)

## publishmq/camel

This submodule is considered optional because it merely provides a supporting utility class ([AddExchangeHeaders](#)).

Maven can report modules dependencies of this submodule using:

```
mvn dependency:list -o -pl modules/spi/publishmq/impl/camel -D excludeTransitive=true
```

which, excluding Apache Isis modules, returns these compile/runtime dependencies:

```
org.apache.camel:camel-core:jar:2.15.2
org.apache.camel:camel-spring:jar:2.15.2
org.apache.camel:camel-spring-javaconfig:jar:2.15.2
org.apache.camel:camel-jms:jar:2.15.2
```

For further details on 3rd-party dependencies, see:

- [Apache Camel](#)

## publishmq/statusclient

This submodule is considered optional; it provides the mechanism for a beans within a Camel route to report status back to the originating system via the RestfulObjects viewer's REST API.



Using the status client requires the originating system to have configured `publishmq/jdo` to persist the status messages.

Maven can report modules dependencies of this submodule using:

```
mvn dependency:list -o -pl modules/spi/publishmq/impl/statusclient -D
excludeTransitive=true
```

which, excluding Apache Isis modules, returns these compile/runtime dependencies:

```
org.slf4j:slf4j-api:jar:1.7.21
org.jboss.spec.javax.ws.rs:jboss-jaxrs-api_2.0_spec:jar:1.0.0.Final
com.fasterxml.jackson.core:jackson-databind:jar:2.8.0
```

For further details on 3rd-party dependencies, see:

- [Slf4j](#)
- [Jackson](#)



# Dependencies

In addition to Apache Isis, this module also depends upon:

- [ActiveMQ](#)
- (optional) [Camel](#)