

F4: External Integrations

Introducing Camel

What is Camel?

Good question. See: <http://camel.apache.org/what-is-camel.html>

Too many buzzwords - what exactly is Camel?

Okay, so the description above is technology focused.
There's a great discussion about Camel at **Stack Overflow**.

So really you want see this: <http://stackoverflow.com/questions/8845186/what-exactly-is-apache-camel>

In short...

- Camel is a framework for creating small message based applications... and then some.
- Camel formalizes working with messages so well it can be described in multiple formats: Java, Spring/Blueprint XML, and Scala.
- Camel is all the code you should not have to write in order to work with queues, files, databases, RESTful APIs, common data formats, command line utilities, etc... in a consistent and reliable manner.

Available Camel Components

<http://camel.apache.org/components.html>

- ActiveMQ
- AWS SQS
- DropBox
- System calls
- Local files
- FTP
- HTTP resources
- LDAP
- SMTP
- SQL
- Twitter
- etc, etc, etc

Camel can run...

- As a stand-alone Java application
- In a servlet container like Tomcat or Jetty
- In an OSGi runtime such as Karaf

What is OSGi?

- Open Service Gateway Initiative
- Framework for modularizing and deploying Java applications
 - Hot deployment
 - Automatic reloading of configuration
 - Sophisticated dependency resolution
 - XML scripting for complex deployments (features)

Hot Deployment

Bundles can be started, stopped, updated, etc... at runtime!

In other words:

**YOU DO NOT HAVE TO RESTART
YOUR SERVER TO UPDATE CODE OR
CONFIGURATION**

Terminology

- Apache Camel
 - Endpoints
 - Components
 - Messages
 - Routes
- Apache Karaf -- OSGi
 - Bundles
 - Features

Hands-On: Into the Vagrant

```
> vagrant ssh
```

or:

```
> ssh -p 2222 vagrant@localhost
```

password = vagrant

Detour: Fixity corruption revisited

```
> cd /var/lib/tomcat7/fcrepo4-data/fcrepo.binary.directory  
> sudo su  
> find . -name [cover.jpg-sha1]  
> echo hello >> [full-path-from-previous-command]  
> exit
```

Hands-On: Inspect features

```
> /opt/karaf/bin/client
```

```
>> feature:list | grep fcrepo
```

```
fcrepo-camel
```

```
fcrepo-indexing-triplestore
```

```
fcrepo-audit-triplestore
```

```
fcrepo-indexing-solr
```

```
fcrepo-reindexing
```

```
fcrepo-fixity
```

```
fcrepo-serialization
```

Hands-On: Helpful Commands

>> feature:install fcrepo-audit-triplestore

>> feature:stop <whichever>

>> camel:route-list

>> bundle:list | grep fcrepo

>> ctrl-d

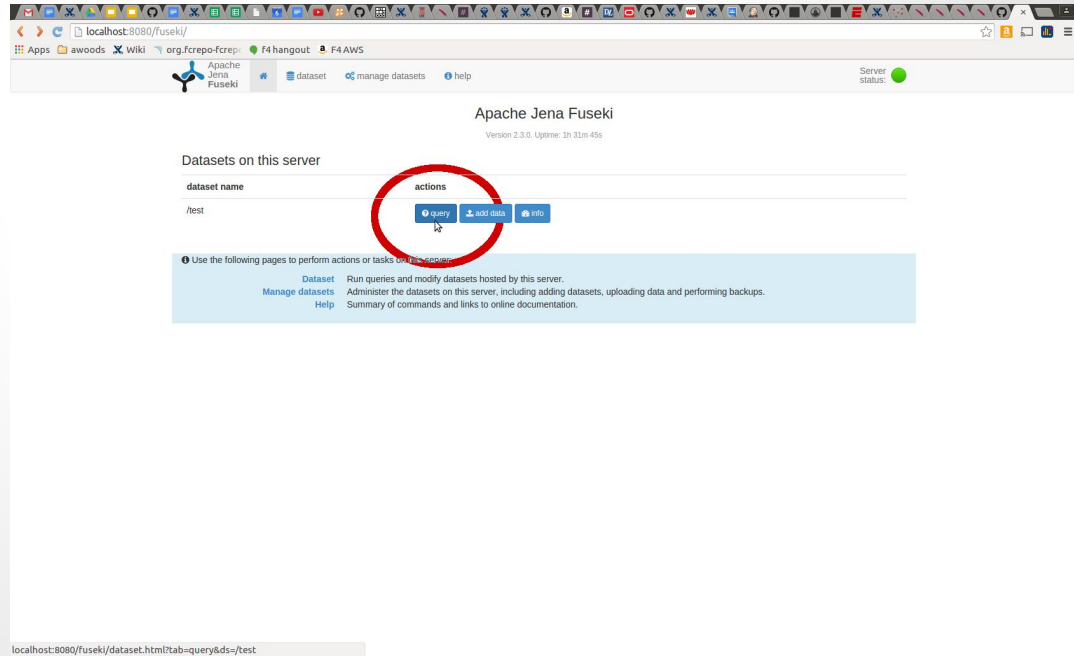
Hands-On: Watch the log

In a new vagrant ssh terminal:

```
> sudo tail -f /opt/karaf/data/log/karaf.log
```

Hands-On: Indexing in triplestore

http://localhost:8080/fuseki



Hands-On: Indexing in triplestore

```
select * where {  
  <http://localhost:8080/fcrepo/rest/cover> ?p ?o  
}
```

Hands-On: Indexing in triplestore

PREFIX ldp: <http://www.w3.org/ns/ldp#>

PREFIX ebucore: <http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#>

```
select * where {  
  ?s ldp:contains ?o .  
  ?o ebucore:hasMimeType ?m  
}
```

Hands-On: Indexing in triplestore

Audit

PREFIX premis: <http://www.loc.gov/premis/rdf/v1#>

PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>

```
select ?s ?d where {
```

```
  ?s ?p <http://fedora.info/definitions/v4/audit#InternalEvent> .
```

```
  ?s premis:hasEventRelatedObject <http://localhost:8080/fcrepo/rest/cover> .
```

```
  ?s premis:hasEventDateTime ?d .
```

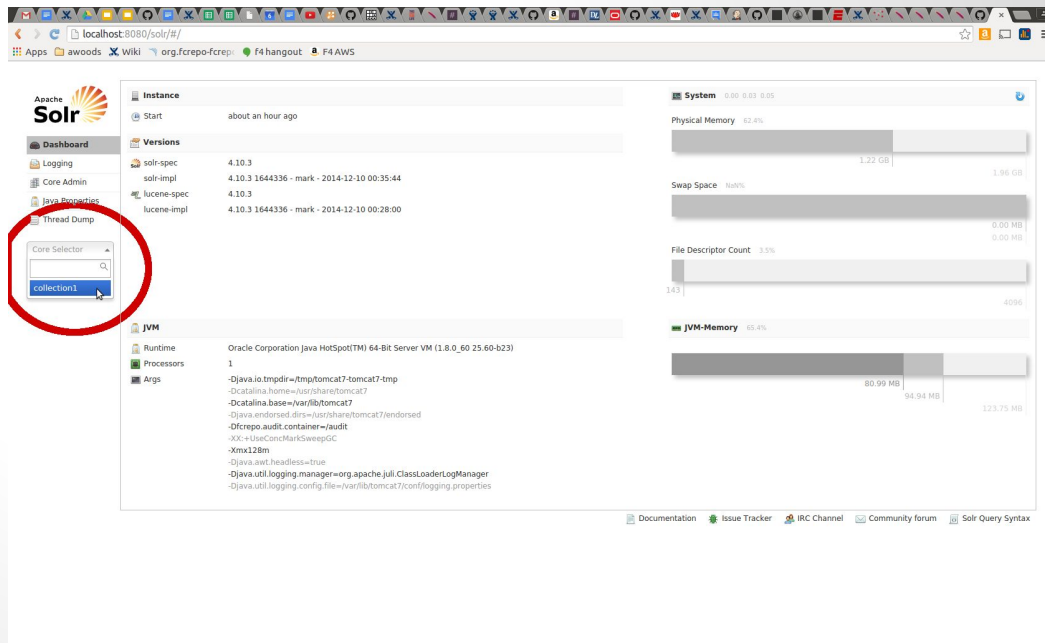
```
  FILTER (?d > "2016-05-24T04:21:14Z"^^xsd:dateTime)
```

```
}
```

Hands-On: Indexing in Solr

<http://localhost:8080/solr>

collection1



The screenshot displays the Apache Solr Admin UI. On the left sidebar, the 'Core Selector' is highlighted with a red circle, and 'collection1' is selected from the dropdown menu. The main content area shows the 'Instance' status as 'Start about an hour ago'. Below this, the 'Versions' table lists the following components and their versions:

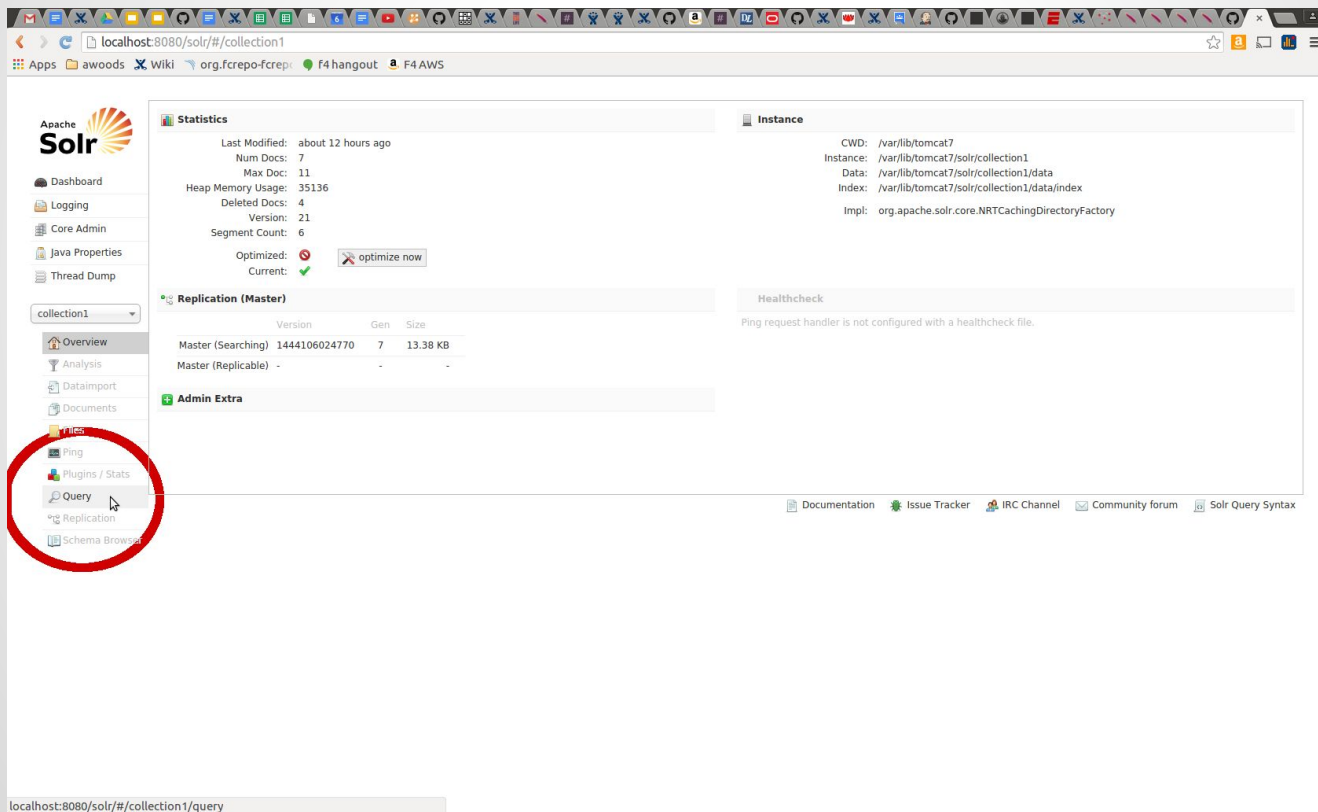
Component	Version
solr-spec	4.10.3
solr-impl	4.10.3 1644336 - mark - 2014-12-10 00:35:44
lucene-spec	4.10.3
lucene-impl	4.10.3 1644336 - mark - 2014-12-10 00:28:00

The 'JVM' section shows the runtime environment: Oracle Corporation Java HotSpot(TM) 64-Bit Server VM (1.8.0_60 25.60-b23). The 'System' section on the right provides resource usage metrics:

- Physical Memory: 62.4% (1.22 GB / 1.96 GB)
- Swap Space: 0% (0.00 MB / 0.00 MB)
- File Descriptor Count: 3.5% (143 / 4096)
- JVM-Memory: 65.4% (80.99 MB / 123.75 MB)

The bottom of the page includes links to Documentation, Issue Tracker, IRC Channel, Community forum, and Solr Query Syntax.

Hands-On: Indexing in Solr



The screenshot displays the Apache Solr Admin UI for a collection named 'collection1'. The left sidebar contains navigation links: Dashboard, Logging, Core Admin, Java Properties, Thread Dump, Overview (selected), Analysis, Dataimport, Documents, Hdfs, Ping, Plugins / Stats, Query (circled in red), Replication, and Schema Browser. The main content area is divided into three sections: Statistics, Instance, and Replication (Master). The Statistics section shows metrics such as Last Modified (about 12 hours ago), Num Docs (7), Max Doc (11), Heap Memory Usage (35136), Deleted Docs (4), Version (21), Segment Count (6), and an 'optimize now' button. The Instance section lists configuration details like CWD, Instance, Data, Index, and Impl. The Replication (Master) section shows a table with columns Version, Gen, and Size, containing one row for Master (Searching) with values 1444106024770, 7, and 13.38 KB. The bottom of the page features links to Documentation, Issue Tracker, IRC Channel, Community forum, and Solr Query Syntax.

localhost:8080/solr/#/collection1

Apps awoods Wiki org.fcrepo-fcrepo f4 hangout F4 AWS

Apache Solr

Dashboard
Logging
Core Admin
Java Properties
Thread Dump
collection1

Overview
Analysis
Dataimport
Documents
Hdfs
Ping
Plugins / Stats
Query
Replication
Schema Browser

Statistics

Last Modified: about 12 hours ago
Num Docs: 7
Max Doc: 11
Heap Memory Usage: 35136
Deleted Docs: 4
Version: 21
Segment Count: 6
Optimized:  
Current:  [optimize now](#)

Instance

CWD: /var/lib/tomcat7
Instance: /var/lib/tomcat7/solr/collection1
Data: /var/lib/tomcat7/solr/collection1/data
Index: /var/lib/tomcat7/solr/collection1/data/index
Impl: org.apache.solr.core.NRTCachingDirectoryFactory

Replication (Master)

	Version	Gen	Size
Master (Searching)	1444106024770	7	13.38 KB
Master (Replicable)	-	-	-

Admin Extra

Healthcheck

Ping request handler is not configured with a healthcheck file.

Documentation Issue Tracker IRC Channel Community forum Solr Query Syntax

localhost:8080/solr/#/collection1/query

Hands-On: Reindexing - prep

- > `sudo service tomcat7 stop`
- > `sudo rm -rf /etc/fuseki/databases/test_data/*`
- > `sudo service tomcat7 start`

Hands-On: Reindexing - check

In Fuseki: <http://localhost:8080/fuseki>

```
select * where {  
  <http://localhost:8080/fcrepo/rest/cover> ?p ?o  
}
```

Hands-On: Reindexing

```
> curl -XPOST localhost:9080/reindexing/cover  
-H"Content-Type: application/json" -d  
'["activemq:queue:triplestore.reindex"]'
```

Hands-On: Fixity - setup

```
> sudo vi /opt/karaf/etc/org.fcrepo.camel.fixity.cfg
```

Change:

```
fixity.success=mock:fixity.success
```

To:

```
fixity.success=file:/tmp/?fileName=fixitySuccess.log&fileExist=Append
```

Hands-On: Fixity

```
> curl -XPOST localhost:9080/reindexing/cover  
-H"Content-Type: application/json" -d  
'["activemq:queue:fixity"]'
```

```
> less /tmp/fixitySuccess.log
```

```
> less /tmp/fixityErrors.log
```

Hands-On: Serialization - RDF

```
> tree /tmp/descriptions
```

Hands-On: Serialization - reconfig

```
> sudo vi /opt/karaf/etc/org.fcrepo.camel.serialization.cfg
```

Change:

```
serialization.includeBinaries=false
```

To:

```
serialization.includeBinaries=true
```

Hands-On: Serialization - Binaries

```
curl -XPOST localhost:9080/reindexing/cover -  
H"Content-Type: application/json" -d  
'["activemq:queue:serialization"]'
```

```
> tree /tmp/binaries
```

Success!