

# First Steps

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This document will walk you through getting the code, building the webapp, and exercising the REST API.

## Prerequisites

Fedora requires Java 8 and Maven 3 (only for building the project). Check that you have them installed before proceeding:

```
$ java -version
java version "1.8.0_73"
Java(TM) SE Runtime Environment (build 1.8.0_73-b02)
Java HotSpot(TM) 64-Bit Server VM (build 25.73-b02, mixed mode)

$ mvn -version
Apache Maven 3.3.9 (bb52d8502b132ec0a5a3f4c09453c07478323dc5; 2015-11-10T10:41:47-06:00)
Maven home: /Users/kfordl/Programs/apache-maven-3.3.9
Java version: 1.8.0_73, vendor: Oracle Corporation
Java home: /Library/Java/JavaVirtualMachines/jdk1.8.0_73.jdk/Contents/Home/jre
Default locale: en_US, platform encoding: UTF-8
OS name: "mac os x", version: "10.13.6", arch: "x86_64", family: "mac"
```

## Building Fedora

You can [download pre-compiled binaries](#) and [run Fedora in an existing Tomcat or Jetty instance](#) or pre-packaged Jetty instances, or build Fedora from source (it's not difficult or time consuming).

Clone the latest code from Github:

```
$ git clone https://github.com/fcrepo4/fcrepo4.git
Cloning into 'fc4'...
remote: Counting objects: 40152, done.
remote: Compressing objects: 100% (12759/12759), done.
Receiving objects: 14% (5622/40152), 3.68 MiB | 912 KiB/s
[...]

$ cd fcrepo4
```

And build the project (the first time you build Fedora may take some time and bandwidth to download all the development dependencies):

```

$ MAVEN_OPTS="-Xmx1024m -XX:MaxPermSize=256m" mvn clean install
[INFO] Scanning for projects...
[INFO] -----
[INFO] Reactor Build Order:
[INFO]
[INFO] Fedora Commons 4 :: Parent POM
[INFO] Fedora Commons 4
[INFO] Fedora Repository BOM
[INFO] Fedora Repository JCR BOM
[INFO] Fedora Repository BOMs
[INFO] Fedora Repository Kernel API
[INFO] Fedora Repository Configurations Module
[INFO] Fedora Repository Kernel Implementation (ModeShape)
[INFO] Fedora Event Serialization
[INFO] Fedora Repository JMS Module
[INFO] Fedora Repository HTTP Commons Module
[INFO] Fedora Repository Authorization Commons Module
[INFO] Fedora Repository HTTP API Module
[INFO] Fedora Repository WebAC Authorization Module
[INFO] Fedora Repository Deployable Web Application
[INFO] Fedora Repository LDP integration tests Module
[INFO] Fedora Repository RDF integration tests Module
[INFO]
[INFO] -----
[INFO] Building Fedora Commons 4 :: Parent POM 5.0.0-SNAPSHOT
[INFO] -----
[INFO]
[INFO] --- maven-clean-plugin:2.5:clean (default-clean) @ fcrepo ---
[INFO] Deleting /Volumes/TempStorage/fedora4/fcrepo4/target
[INFO]
[INFO] --- maven-enforcer-plugin:1.2:enforce (enforce-maven) @ fcrepo ---
[INFO]
[INFO] --- maven-enforcer-plugin:1.2:enforce (default) @ fcrepo ---
[INFO]
[INFO] --- jacoco-maven-plugin:0.6.3.201306030806:prepare-agent (pre-unit-test) @ fcrepo ---
[....]

```

## Running the Fedora webapp

The webapp can be run from a bundled instance of jetty. The application will listen on port 8080 by default.

If you would like to run the webapp on a different port, you can add the "jetty.port" option in your maven command (e.g. `mvn -Djetty.port=8181 jetty:run`)

```

$ cd fcrepo-webapp
$ MAVEN_OPTS="-Xmx512m" mvn jetty:run
[...]
TRACE 10:50:43.845 (SessionProvider) Returning new Injectablesession...
DEBUG 10:50:43.845 (Injectablesession) Initializing an Injectablesession with SessionFactory org.fcrepo.session.
SessionFactory@5a3c8525.
TRACE 10:50:43.846 (SessionProvider) Returning new Injectablesession...
DEBUG 10:50:43.846 (Injectablesession) Initializing an Injectablesession with SessionFactory org.fcrepo.session.
SessionFactory@5a3c8525.
2013-07-01 10:50:44.027:INFO:oejs.AbstractConnector:Started SelectChannelConnector@0.0.0.0:8080
[INFO] Started Jetty Server
[INFO] Starting scanner at interval of 2 seconds.

```

There's a nice, friendly HTML interface waiting for you at <http://localhost:8080/rest/> (the default username and password is fedoraAdmin)

## REST API Examples

The [REST API documentation](#) provides a full listing of the features and functions of the REST API. Here are some examples to get you started:

```

$ curl "http://localhost:8080/rest/" -ufedoraAdmin:fedoraAdmin
@prefix premis: <http://www.loc.gov/premis/rdf/v1#> .
@prefix test: <info:fedora/test/> .
@prefix memento: <http://mementoweb.org/ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix webac: <http://fedora.info/definitions/v4/webac#> .
@prefix acl: <http://www.w3.org/ns/auth/acl#> .
@prefix ns001: <http://localhost:8080/rest/ktest/> .
@prefix xsi: <http://www.w3.org/2001/XMLSchema-instance> .
@prefix xmlns: <http://www.w3.org/2000/xmlns/> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix fedora: <http://fedora.info/definitions/v4/repository#> .
@prefix xml: <http://www.w3.org/XML/1998/namespace> .
@prefix ebucore: <http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#> .
@prefix ldp: <http://www.w3.org/ns/ldp#> .
@prefix xs: <http://www.w3.org/2001/XMLSchema> .
@prefix fedoraconfig: <http://fedora.info/definitions/v4/config#> .
@prefix foaf: <http://xmlns.com/foaf/0.1/> .
@prefix dc: <http://purl.org/dc/elements/1.1/> .

<http://localhost:8080/rest/>
  fedora:lastModified          "2018-05-30T20:51:11.833Z"^^<http://www.w3.org/2001/XMLSchema#dateTime> ;
  rdf:type                     ldp:RDFSouce ;
  rdf:type                     ldp:Container ;
  rdf:type                     ldp:BasicContainer ;
  fedora:writable              true ;
  rdf:type                     fedora:RepositoryRoot ;
  rdf:type                     fedora:Resource ;
  rdf:type                     fedora:Container ;
  ldp:contains                 <http://localhost:8080/rest/ktest> ;
  ldp:contains                 <http://localhost:8080/rest/91/86/4c/e0/91864ce0-9ad2-49cd-b2c3-
85b0c6b204e5> ;
  ldp:contains                 <http://localhost:8080/rest/examples> ;
  ldp:contains                 <http://localhost:8080/rest/t1> ;
  fedora:hasTransactionProvider <http://localhost:8080/rest/fcr:tx> .

```

The REST API supports a variety of RDF serialization formats, including:

```

$ curl http://localhost:8080/rest/ -H "Accept: application/rdf+xml" -ufedoraAdmin:fedoraAdmin
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:acl="http://www.w3.org/ns/auth/acl#"
  xmlns:ldp="http://www.w3.org/ns/ldp#"
  xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:webac="http://fedora.info/definitions/v4/webac#"
  xmlns:ns001="http://localhost:8080/rest/ktest/"
  xmlns:dc="http://purl.org/dc/elements/1.1/"
  xmlns:ebucore="http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#"
  xmlns:premis="http://www.loc.gov/premis/rdf/v1#"
  xmlns:test="info:fedora/test/"
  xmlns:fedora="http://fedora.info/definitions/v4/repository#"
  xmlns:memento="http://mementoweb.org/ns#"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:foaf="http://xmlns.com/foaf/0.1/"
  xmlns:fedoraconfig="http://fedora.info/definitions/v4/config#" >
<rdf:Description rdf:about="http://localhost:8080/rest/">
  <rdf:type rdf:resource="http://fedora.info/definitions/v4/repository#Resource"/>
  <ldp:contains rdf:resource="http://localhost:8080/rest/examples"/>
  <ldp:contains rdf:resource="http://localhost:8080/rest/91/86/4c/e0/91864ce0-9ad2-49cd-b2c3-85b0c6b204e5"/>
  <fedora:hasTransactionProvider rdf:resource="http://localhost:8080/rest/fcr:tx"/>
  <ldp:contains rdf:resource="http://localhost:8080/rest/ktest"/>
  <fedora:lastModified rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2018-05-30T20:51:11.833Z<
/fedora:lastModified>
  <fedora:writable rdf:datatype="http://www.w3.org/2001/XMLSchema#boolean">true</fedora:writable>
  <rdf:type rdf:resource="http://www.w3.org/ns/ldp#RDFSSource"/>
  <rdf:type rdf:resource="http://fedora.info/definitions/v4/repository#RepositoryRoot"/>
  <rdf:type rdf:resource="http://www.w3.org/ns/ldp#Container"/>
  <ldp:contains rdf:resource="http://localhost:8080/rest/t1"/>
  <rdf:type rdf:resource="http://fedora.info/definitions/v4/repository#Container"/>
  <rdf:type rdf:resource="http://www.w3.org/ns/ldp#BasicContainer"/>
</rdf:Description>
</rdf:RDF>

```

or

```

$ curl http://localhost:8080/rest/ -H "Accept: application/n-triples" -ufedoraAdmin:fedoraAdmin
<http://localhost:8080/rest/> <http://fedora.info/definitions/v4/repository#lastModified> "2018-05-30T20:51:
11.833Z"^^<http://www.w3.org/2001/XMLSchema#dateTime> .
<http://localhost:8080/rest/> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://www.w3.org/ns
/ldp#RDFSSource> .
<http://localhost:8080/rest/> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://www.w3.org/ns
/ldp#Container> .
<http://localhost:8080/rest/> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://www.w3.org/ns
/ldp#BasicContainer> .
<http://localhost:8080/rest/> <http://fedora.info/definitions/v4/repository#writable> "true"^^<http://www.w3.org
/2001/XMLSchema#boolean> .
<http://localhost:8080/rest/> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://fedora.info/definitions
/v4/repository#RepositoryRoot> .
<http://localhost:8080/rest/> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://fedora.info/definitions
/v4/repository#Resource> .
<http://localhost:8080/rest/> <http://www.w3.org/1999/02/22-rdf-syntax-ns#type> <http://fedora.info/definitions
/v4/repository#Container> .
<http://localhost:8080/rest/> <http://www.w3.org/ns/ldp#contains> <http://localhost:8080/rest/ktest> .
<http://localhost:8080/rest/> <http://www.w3.org/ns/ldp#contains> <http://localhost:8080/rest/91/86/4c/e0
/91864ce0-9ad2-49cd-b2c3-85b0c6b204e5> .
<http://localhost:8080/rest/> <http://www.w3.org/ns/ldp#contains> <http://localhost:8080/rest/examples> .
<http://localhost:8080/rest/> <http://www.w3.org/ns/ldp#contains> <http://localhost:8080/rest/t1> .
<http://localhost:8080/rest/> <http://fedora.info/definitions/v4/repository#hasTransactionProvider>
<http://localhost:8080/rest/fcr:tx> .

```

**Create a new object**

```

$ curl http://localhost:8080/rest/ -X POST -v -ufedoraAdmin:fedoraAdmin
* Trying ::1...
* TCP_NODELAY set
* Connected to localhost (::1) port 8080 (#0)
* Server auth using Basic with user 'fedoraAdmin'
> POST /rest/ HTTP/1.1
> Host: localhost:8080
> Authorization: Basic ZmVkb3JhQWRtaW46ZmVkb3JhQWRtaW4=
> User-Agent: curl/7.60.0
> Accept: */*
>
< HTTP/1.1 201 Created
< Date: Thu, 02 Aug 2018 14:50:46 GMT
< Set-Cookie: JSESSIONID=laftnonavsnvk1q6ln4jtle4;Path=/
< Expires: Thu, 01 Jan 1970 00:00:00 GMT
< Set-Cookie: rememberMe=deleteMe; Path=/; Max-Age=0; Expires=Wed, 01-Aug-2018 14:50:46 GMT
< ETag: W/"187414816f9004f45508769998bec981ca90bea4"
< Last-Modified: Thu, 02 Aug 2018 14:50:46 GMT
< Link: <http://localhost:8080/static/constraints/ContainerConstraints.rdf>; rel="http://www.w3.org/ns
/ldp#constrainedBy"
< Link: <http://localhost:8080/rest/39965e35-4cad-4b96-b826-0c8612f773d5/fcr:acl>; rel="acl"
< Location: http://localhost:8080/rest/39965e35-4cad-4b96-b826-0c8612f773d5
< Content-Type: text/plain
< Content-Length: 63
< Server: Jetty(9.3.1.v20150714)
<
* Connection #0 to host localhost left intact
http://localhost:8080/rest/39965e35-4cad-4b96-b826-0c8612f773d5

$ curl http://localhost:8080/rest/7f/50/8e/82/7f508e82-15f7-48de-92a3-2575alb749cf -ufedoraAdmin:fedoraAdmin
@prefix premis: <http://www.loc.gov/premis/rdf/v1#> .
@prefix test: <info:fedora/test/> .
@prefix memento: <http://mementoweb.org/ns#> .
@prefix rdfs: <http://www.w3.org/2000/01/rdf-schema#> .
@prefix webac: <http://fedora.info/definitions/v4/webac#> .
@prefix acl: <http://www.w3.org/ns/auth/acl#> .
@prefix ns001: <http://localhost:8080/rest/ktest/> .
@prefix xsi: <http://www.w3.org/2001/XMLSchema-instance> .
@prefix xmlns: <http://www.w3.org/2000/xmlns/> .
@prefix rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#> .
@prefix fedora: <http://fedora.info/definitions/v4/repository#> .
@prefix xml: <http://www.w3.org/XML/1998/namespace> .
@prefix ebucore: <http://www.ebu.ch/metadata/ontologies/ebucore/ebucore#> .
@prefix ldp: <http://www.w3.org/ns/ldp#> .
@prefix xs: <http://www.w3.org/2001/XMLSchema> .
@prefix fedoraconfig: <http://fedora.info/definitions/v4/config#> .
@prefix foaf: <http://xmlns.com/foaf/0.1/> .
@prefix dc: <http://purl.org/dc/elements/1.1/> .

<http://localhost:8080/rest/39965e35-4cad-4b96-b826-0c8612f773d5>
    rdf:type                fedora:Container ;
    rdf:type                fedora:Resource ;
    rdf:type                ldp:BasicContainer ;
    fedora:lastModifiedBy   "fedoraAdmin" ;
    fedora:createdBy       "fedoraAdmin" ;
    fedora:created          "2018-08-02T14:50:46.121Z"^^<http://www.w3.org/2001/XMLSchema#dateTime> ;
    fedora:lastModified     "2018-08-02T14:50:46.121Z"^^<http://www.w3.org/2001/XMLSchema#dateTime> ;
    rdf:type                ldp:RDFSsource ;
    rdf:type                ldp:Container ;
    fedora:writable         true .

```

## Delete an object

```
$ curl -X DELETE http://localhost:8080/rest/39965e35-4cad-4b96-b826-0c8612f773d5 -ufedoraAdmin:fedoraAdmin
```