

Sprint 3 Feedback - Joe Atzberger

- Test Environment
 - Composition of Resources
 - Installation
 - Initialization
- Test 0 - Export partial: albums
 - Test 0 Conclusions
- Test 1 - Full export/import/export
 - Test 1 Conclusions
 - Test 2 - Another Trip
 - Test 2 Conclusions
 - Comments:

Test Environment

MacOS 10.11.6

Composition of Resources

Used data from https://github.com/fcrepo4-labs/fcrepo-sample-dataset/tree/master/additional_datasets

1. [lubm](#)
2. [10kIndirectContainers](#)
3. manually created (in UI) simple object w/ uploaded file

Installation

1. Install postgres 9.6.1 via homebrew: **brew install postgres**
2. **gem install fcrepo_wrapper**
3. Create config file **.fcrepo_wrapper**:

```
port: 8984
enable_jms: false
```

4. Clone <https://github.com/fcrepo4-labs/fcrepo-import-export> and build 0.1.1 via **mvn clean install**
5. Clone <https://github.com/fcrepo4-labs/fcrepo-sample-dataset> and extract:

```
cd fcrepo-sample-dataset/additional_datasets/
tar xzvf lubm/LUBM_02.tar.gz
tar xzvf 10kIndirectContainers/10kIndirectContainers.tar.gz
```

Initialization

1. Start postgres: **pg_ctl -D db/postgres start**
2. **fcrepo_wrapper clean**
3. Start Fedora 4.7.0: **fcrepo_wrapper**
4. Confirm Fedora up/empty at: <http://localhost:8984/rest/>
5. **curl -X POST -d "/full/path/to/fcrepo-sample-dataset/additional_datasets/LUBM_02/" "http://localhost:8984/rest/fcr:restore"**
6. Restore extracted reference dataset(s):

```
curl -X POST -d "/full/path/to/fcrepo-sample-dataset/additional_datasets/LUBM_02/"
"http://localhost:8984/rest/fcr:restore"
curl -X POST -d "/full/path/to/fcrepo-sample-dataset/additional_datasets/10kIndirectContainers/"
"http://localhost:8984/rest/fcr:restore"
```

7. Confirm 100 "objects" and 10000 "memberCollection" loaded at: <http://localhost:8984/rest/>
8. From "objects" node in UI, create an "albums" container. Add one binary to it, uploading an image file.

Test 0 - Export partial: albums

Directory (11360) will vary.

```
java -jar target/fcrepo-import-export-0.1.1-SNAPSHOT.jar --mode export --resource http://localhost:8984/rest/11360/objects/albums --dir /Users/atz/repos/import_export_test/ --binaries
java -jar target/fcrepo-import-export-0.1.1-SNAPSHOT.jar -x .json -l application/ld+json --mode export --resource http://localhost:8984/rest/11360/objects/albums --dir /Users/atz/repos/import_export_test/ --binaries
```

Test 0 Conclusions

1. + Repeated (successful) exports do not alter target dir after first run
2. + If export is repeated after file is deleted, the export does replace the file, both binary and text.
3. + If export is repeated after file is corrupted, the export does restore the file, both binary and text.

Test 1 - Full export/import/export

Export:

```
java -jar target/fcrepo-import-export-0.1.1-SNAPSHOT.jar --mode export --resource http://localhost:8984/rest/ --dir /Users/atz/repos/import_export_test/ --binaries
```

Deleting everything at <http://127.0.0.1:8984/rest/11360> fails:

```
WARN 16:23:22.499 (arjuna) ARJUNA012117: TransactionReaper::check timeout for TX 0:ffff0a000004:e85c:588f9f9e:a9 in state RUN
WARN 16:31:53.376 (arjuna) ARJUNA012117: TransactionReaper::check timeout for TX 0:ffff0a000004:e85c:588f9f9e:a9 in state SCHEDULE_CANCEL
WARN 16:31:57.952 (arjuna) ARJUNA012095: Abort of action id 0:ffff0a000004:e85c:588f9f9e:a9 invoked while multiple threads active within it.
WARN 16:32:08.391 (arjuna) ARJUNA012108: CheckedAction::check - atomic action 0:ffff0a000004:e85c:588f9f9e:a9 aborting with 1 threads active!
WARN 16:32:08.391 (arjuna) ARJUNA012117: TransactionReaper::check timeout for TX 0:ffff0a000004:e85c:588f9f9e:a9 in state CANCEL_INTERRUPTED
WARN 16:32:46.082 (arjuna) ARJUNA012120: TransactionReaper::check worker Thread[Transaction Reaper Worker 0,5,main] not responding to interrupt when cancelling TX 0:ffff0a000004:e85c:588f9f9e:a9 -- worker marked as zombie and TX scheduled for mark-as-rollback
WARN 16:32:59.021 (arjuna) ARJUNA012110: TransactionReaper::check successfully marked TX 0:ffff0a000004:e85c:588f9f9e:a9 as rollback only
WARN 16:33:25.371 (arjuna) ARJUNA012113: TransactionReaper::doCancellations worker Thread[Transaction Reaper Worker 0,5,main] missed interrupt when cancelling TX 0:ffff0a000004:e85c:588f9f9e:a9 -- exiting as zombie (zombie count decremented to 0)
```

Then, manually called **kill -9** on fedora java process. Cleaned out installation and restarted Fedora.

Import:

```
java -jar target/fcrepo-import-export-0.1.1-SNAPSHOT.jar --mode import --resource http://localhost:8984/rest/ --dir /Users/atz/repos/import_export_test/ --binaries --auditLog
```

Finishes successfully with log message in **importexport_audit_20170130T170006.log**:

```
...
2017-01-30 17:10:11,021 Finished import... 20006 resources imported
```

But simultaneously, Fedora crashes again. Looks like a normal shutdown but was unprompted (no "Fedora is shutting down." message):

```
[Thread-0] INFO org.simplericity.jettyconsole.DefaultJettyManager - Shutting down Fedora Repository
Deployable Web Application 4.7.0..
[Thread-0] INFO org.eclipse.jetty.server.ServerConnector - Stopped ServerConnector@1f39269d{HTTP/1.1}{0.0.0.0:8984}
[Thread-0] INFO / - Closing Spring root WebApplicationContext
[Thread-0] INFO org.eclipse.jetty.server.handler.ContextHandler - Stopped o.s.j.
JettyConsoleWebappContext@1e643faf{/,file:/private/var/folders/6q/13dm9dcn1qx_gw9x661hl7jc0000gq/T/fcrepo-webapp-4.7.0-jetty-console.jar_8984/webapp/,UNAVAILABLE}{/private/var/folders/6q/13dm9dcn1qx_gw9x661hl7jc0000gq/T/fcrepo-webapp-4.7.0-jetty-console/fcrepo-webapp-4.7.0-jetty-console.jar}
[Thread-0] INFO org.simplericity.jettyconsole.DefaultJettyManager - Shutdown of Fedora Repository Deployable Web Application 4.7.0 complete.
```

After restart, appears empty. So import failed. On second identical attempt, succeeded with the same "Finished import... 20006 resources imported" message.

Export (Test 0) again:

```
java -jar target/fcrepo-import-export-0.1.1-SNAPSHOT.jar --mode export --resource http://localhost:8984/rest/11360/objects/albums --dir /Users/atz/repos/import_export_test/ --binaries
```

Diff of jsonld files:

```

--- a/rest/11360/objects/albums.jsonld
+++ b/rest/11360/objects/albums.jsonld
@@ -1,9 +1,9 @@
[ {
  "@id" : "http://localhost:8984/rest/11360/objects/albums",
-  "@type" : [ "http://fedora.info/definitions/v4/repository#Container", "http://fedora.info/definitions/v4/repository#Resource", "http://www.w3.org/ns/ldp#RDFSSource", "http://www.w3.org/ns/ldp#Container" ],
+  "@type" : [ "http://fedora.info/definitions/v4/repository#Container", "http://www.w3.org/ns/ldp#Container", "http://www.w3.org/ns/ldp#RDFSSource", "http://fedora.info/definitions/v4/repository#Resource" ],
  "http://fedora.info/definitions/v4/repository#created" : [ {
    "@type" : "http://www.w3.org/2001/XMLSchema#dateTime",
-    "@value" : "2017-01-30T22:23:50.14Z"
+    "@value" : "2017-01-31T01:37:09.859Z"
  } ],
  "http://fedora.info/definitions/v4/repository#createdBy" : [ {
    "@value" : "bypassAdmin"
@@ -13,7 +13,7 @@
  } ],
  "http://fedora.info/definitions/v4/repository#lastModified" : [ {
    "@type" : "http://www.w3.org/2001/XMLSchema#dateTime",
-    "@value" : "2017-01-30T22:24:05.691Z"
+    "@value" : "2017-01-31T01:38:32.169Z"
  } ],
  "http://fedora.info/definitions/v4/repository#lastModifiedBy" : [ {
    "@value" : "bypassAdmin"
diff --git a/rest/11360/objects/albums/0c/7c/4e/29/0c7c4e29-5bc0-4005-95a6-bacd103fddee/fcr%3Ametadata.jsonld b/rest/11360/objects/albums/0c/7c/4e/29/0c7c4e29-5bc0-4005-95a6-bacd103fddee/fcr%3Ametadata.jsonld
index 029aa6b..01e1490 100644
--- a/rest/11360/objects/albums/0c/7c/4e/29/0c7c4e29-5bc0-4005-95a6-bacd103fddee/fcr%3Ametadata.jsonld
+++ b/rest/11360/objects/albums/0c/7c/4e/29/0c7c4e29-5bc0-4005-95a6-bacd103fddee/fcr%3Ametadata.jsonld
@@ -1,9 +1,9 @@
[ {
  "@id" : "http://localhost:8984/rest/11360/objects/albums/0c/7c/4e/29/0c7c4e29-5bc0-4005-95a6-bacd103fddee",
-  "@type" : [ "http://fedora.info/definitions/v4/repository#Binary", "http://fedora.info/definitions/v4/repository#Resource", "http://www.w3.org/ns/ldp#NonRDFSSource" ],
+  "@type" : [ "http://www.w3.org/ns/ldp#NonRDFSSource", "http://fedora.info/definitions/v4/repository#Binary", "http://fedora.info/definitions/v4/repository#Resource" ],
  "http://fedora.info/definitions/v4/repository#created" : [ {
    "@type" : "http://www.w3.org/2001/XMLSchema#dateTime",
-    "@value" : "2017-01-30T22:24:05.694Z"
+    "@value" : "2017-01-31T01:38:32.179Z"
  } ],
  "http://fedora.info/definitions/v4/repository#createdBy" : [ {
    "@value" : "bypassAdmin"
@@ -16,7 +16,7 @@
  } ],
  "http://fedora.info/definitions/v4/repository#lastModified" : [ {
    "@type" : "http://www.w3.org/2001/XMLSchema#dateTime",
-    "@value" : "2017-01-30T22:24:05.694Z"
+    "@value" : "2017-01-31T01:38:32.179Z"
  } ],
  "http://fedora.info/definitions/v4/repository#lastModifiedBy" : [ {
    "@value" : "bypassAdmin"

```

So the salient differences for JSON+LD are timestamps and the order of **@type** elements.

But for Turtle, the diff is semantically distinct. The timestamps differ in the same way, but the objects have acquired new **ldp:Container** , **ldp:RDFSSource** and **ldp:NonRDFSSource** values, respectively.

Diff (condensed):

```

--- rest/11360/objects/albums.ttl
-<http://localhost:8984/rest/11360/objects/albums> a fedora:Container , fedora:Resource ;
+<http://localhost:8984/rest/11360/objects/albums> a fedora:Container , ldp:Container , ldp:RDFSsource , fedora:
Resource ;
...
--- rest/11360/objects/albums/0c/7c/4e/29/0c7c4e29-5bc0-4005-95a6-bacd103fddee/fcr%3Ametadata.ttl
-<http://localhost:8984/rest/11360/objects/albums/0c/7c/4e/29/0c7c4e29-5bc0-4005-95a6-bacd103fddee> a fedora:
Binary , fedora:Resource ;
+<http://localhost:8984/rest/11360/objects/albums/0c/7c/4e/29/0c7c4e29-5bc0-4005-95a6-bacd103fddee> a ldp:
NonRDFSsource , fedora:Binary , fedora:Resource ;

```

Test 1 Conclusions

1. [blocked URL](#) Fedora unresponsive during large (failing) delete operation in UI. This is probably a known problem.
2. [blocked URL](#) Fedora responsive during large import operation, but then crashes and fails the whole load.
3. [blocked URL](#) Round trip adds semantic information.

Test 2 - Another Trip

Import again, without deleting.

```

java -jar target/fcrepo-import-export-0.1.1-SNAPSHOT.jar --mode import --resource http://localhost:8984
/rest/ --dir /Users/atz/repos/import_export_test/ --binaries --auditLog

```

Same log message: "Finished import... 20006 resources imported"

Repeat Test 0:

- Only timestamps change, semantic fields stabilized.

Repeat Test 1:

- TTL diffs unreadable because of extreme line-length, but the element <http://localhost:8984/rest/11360/memberCollection> still has the same 10,000 PCDM:hasMember objects.

Diff after TTL re-export includes:

```

20004 files changed, 60098 insertions(+), 60098 deletions(-)
rewrite rest/11360/memberCollection.ttl (85%)
rewrite rest/11360/memberCollection/members.ttl (82%)
rewrite rest/11360/objects.ttl (85%)

```

The same semantic differences are evident per file, e.g.:

```

-<http://localhost:8984/rest/11360/objects/47/2e/63/66/472e6366-627c-42ac-b8fd-f131b48bf3fc> a fedora:
Container , fedora:Resource ;
+<http://localhost:8984/rest/11360/objects/47/2e/63/66/472e6366-627c-42ac-b8fd-f131b48bf3fc> a fedora:Container
, ldp:Container , ldp:RDFSsource ,
fedora:Resource ;

```

During execution the following errors were thrown in fedora's terminal:

```

ERROR 18:29:01.923 (FedoraInvalidNamespaceExceptionMapper) NamespaceExceptionMapper caught an exception:
Prefix fcr has not been registered
ERROR 18:36:22.781 (velocity) VelocimacroProxy.render() : exception VM = #triples()
org.eclipse.jetty.io.EOFException: null

```

```
at org.eclipse.jetty.io.ChannelEndPoint.flush(ChannelEndPoint.java:192) ~[jetty-io-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.eclipse.jetty.io.WriteFlusher.write(WriteFlusher.java:337) ~[jetty-io-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.eclipse.jetty.io.AbstractEndPoint.write(AbstractEndPoint.java:128) ~[jetty-io-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.eclipse.jetty.server.HttpConnection$SendCallback.process(HttpConnection.java:646) ~[jetty-server-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.eclipse.jetty.util.IteratingCallback.processIterations(IteratingCallback.java:233) ~[jetty-util-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.eclipse.jetty.util.IteratingCallback.iterate(IteratingCallback.java:193) ~[jetty-util-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.eclipse.jetty.server.HttpConnection.send(HttpConnection.java:457) [jetty-server-9.2.3.v20140905.jar:9.2.3.v20140905]
at org.eclipse.jetty.server.HttpChannel.sendResponse(HttpChannel.java:769) [jetty-server-9.2.3.v20140905.jar:9.2.3.v20140905]
at org.eclipse.jetty.server.HttpChannel.write(HttpChannel.java:802) [jetty-server-9.2.3.v20140905.jar:9.2.3.v20140905]
at org.eclipse.jetty.server.HttpOutput.write(HttpOutput.java:139) ~[jetty-server-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.eclipse.jetty.server.HttpOutput.write(HttpOutput.java:132) ~[jetty-server-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.eclipse.jetty.server.HttpOutput.write(HttpOutput.java:347) ~[jetty-server-9.3.1.v20150714.jar:9.2.3.v20140905]
at org.glassfish.jersey.servlet.internal.ResponseWriter$NonCloseableOutputStreamWrapper.write(ResponseWriter.java:325) ~[jersey-container-servlet-core-2.22.2.jar:na]
at org.glassfish.jersey.message.internal.CommittingOutputStream.write(CommittingOutputStream.java:229) ~[jersey-common-2.22.2.jar:na]
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor$UnCloseableOutputStream.write(WriterInterceptorExecutor.java:299) ~[jersey-common-2.22.2.jar:na]
at sun.nio.cs.StreamEncoder.writeBytes(StreamEncoder.java:221) ~[na:1.8.0_31]
at sun.nio.cs.StreamEncoder.implWrite(StreamEncoder.java:282) ~[na:1.8.0_31]
at sun.nio.cs.StreamEncoder.write(StreamEncoder.java:125) ~[na:1.8.0_31]
at sun.nio.cs.StreamEncoder.write(StreamEncoder.java:135) ~[na:1.8.0_31]
at java.io.OutputStreamWriter.write(OutputStreamWriter.java:220) ~[na:1.8.0_31]
at java.io.Writer.write(Writer.java:157) ~[na:1.8.0_31]
at org.apache.velocity.runtime.parser.node.ASTReference.render(ASTReference.java:491) ~[velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.parser.node.ASTBlock.render(ASTBlock.java:72) ~[velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.parser.node.ASTIfStatement.render(ASTIfStatement.java:87) ~[velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.parser.node.ASTBlock.render(ASTBlock.java:72) ~[velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.directive.Foreach.render(Foreach.java:420) ~[velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.parser.node.ASTDirective.render(ASTDirective.java:207) [velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.parser.node.ASTBlock.render(ASTBlock.java:72) ~[velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.directive.VelocimacroProxy.render(VelocimacroProxy.java:216) ~[velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.directive.RuntimeMacro.render(RuntimeMacro.java:311) [velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.directive.RuntimeMacro.render(RuntimeMacro.java:230) [velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.parser.node.ASTDirective.render(ASTDirective.java:207) [velocity-1.7.jar:1.7]
at org.apache.velocity.runtime.parser.node.SimpleNode.render(SimpleNode.java:342) [velocity-1.7.jar:1.7]
at org.apache.velocity.Template.merge(Template.java:356) [velocity-1.7.jar:1.7]
at org.apache.velocity.Template.merge(Template.java:260) [velocity-1.7.jar:1.7]
at org.fcrepo.http.api.responses.StreamingBaseHtmlProvider.writeTo(StreamingBaseHtmlProvider.java:171) [fcrepo-http-api-4.7.0.jar:4.7.0]
at org.fcrepo.http.api.responses.StreamingBaseHtmlProvider.writeTo(StreamingBaseHtmlProvider.java:76) [fcrepo-http-api-4.7.0.jar:4.7.0]
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor$TerminalWriterInterceptor.invokeWriteTo(WriterInterceptorExecutor.java:265) [jersey-common-2.22.2.jar:na]
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor$TerminalWriterInterceptor.aroundWriteTo(WriterInterceptorExecutor.java:250) [jersey-common-2.22.2.jar:na]
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor.proceed(WriterInterceptorExecutor.java:162) [jersey-common-2.22.2.jar:na]
at org.glassfish.jersey.server.internal.JsonWithPaddingInterceptor.aroundWriteTo(JsonWithPaddingInterceptor.java:106) [jersey-server-2.22.2.jar:na]
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor.proceed(WriterInterceptorExecutor.java:162) [jersey-common-2.22.2.jar:na]
at org.glassfish.jersey.server.internal.MappableExceptionWrapperInterceptor.aroundWriteTo(MappableExceptionWrapperInterceptor.java:86) [jersey-server-2.22.2.jar:na]
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor.proceed(WriterInterceptorExecutor.java:162) [jersey-common-2.22.2.jar:na]
at org.glassfish.jersey.message.internal.MessageBodyFactory.writeTo(MessageBodyFactory.java:1130) [jersey-
```

```
common-2.22.2.jar:na]
  at org.glassfish.jersey.server.ServerRuntime$Responder.writeResponse(ServerRuntime.java:711) [jersey-server-
2.22.2.jar:na]
  at org.glassfish.jersey.server.ServerRuntime$Responder.processResponse(ServerRuntime.java:444) [jersey-server-
2.22.2.jar:na]
  at org.glassfish.jersey.server.ServerRuntime$Responder.process(ServerRuntime.java:434) [jersey-server-2.22.2.
jar:na]
  at org.glassfish.jersey.server.ServerRuntime$2.run(ServerRuntime.java:329) [jersey-server-2.22.2.jar:na]
  at org.glassfish.jersey.internal.Errors$1.call(Errors.java:271) [jersey-common-2.22.2.jar:na]
  at org.glassfish.jersey.internal.Errors$1.call(Errors.java:267) [jersey-common-2.22.2.jar:na]
  at org.glassfish.jersey.internal.Errors.process(Errors.java:315) [jersey-common-2.22.2.jar:na]
  at org.glassfish.jersey.internal.Errors.process(Errors.java:297) [jersey-common-2.22.2.jar:na]
  at org.glassfish.jersey.internal.Errors.process(Errors.java:267) [jersey-common-2.22.2.jar:na]
  at org.glassfish.jersey.process.internal.RequestScope.runInScope(RequestScope.java:317) [jersey-common-2.22.2.
jar:na]
  at org.glassfish.jersey.server.ServerRuntime.process(ServerRuntime.java:305) [jersey-server-2.22.2.jar:na]
  at org.glassfish.jersey.server.ApplicationHandler.handle(ApplicationHandler.java:1154) [jersey-server-2.22.2.
jar:na]
  at org.glassfish.jersey.servlet.WebComponent.serviceImpl(WebComponent.java:473) [jersey-container-servlet-core-
2.22.2.jar:na]
  at org.glassfish.jersey.servlet.WebComponent.service(WebComponent.java:427) [jersey-container-servlet-core-
2.22.2.jar:na]
  at org.glassfish.jersey.servlet.ServletContainer.service(ServletContainer.java:388) [jersey-container-servlet-
core-2.22.2.jar:na]
  at org.glassfish.jersey.servlet.ServletContainer.service(ServletContainer.java:341) [jersey-container-servlet-
core-2.22.2.jar:na]
  at org.glassfish.jersey.servlet.ServletContainer.service(ServletContainer.java:228) [jersey-container-servlet-
core-2.22.2.jar:na]
  at org.eclipse.jetty.servlet.ServletHolder.handle(ServletHolder.java:769) [jetty-servlet-9.2.3.v20140905.jar:
9.2.3.v20140905]
  at org.eclipse.jetty.servlet.ServletHandler.doHandle(ServletHandler.java:585) [jetty-servlet-9.2.3.v20140905.
jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.handler.ScopedHandler.handle(ScopedHandler.java:143) [jetty-server-9.2.3.v20140905.
jar:9.2.3.v20140905]
  at org.eclipse.jetty.security.SecurityHandler.handle(SecurityHandler.java:577) [jetty-security-9.2.3.v20140905.
jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.session.SessionHandler.doHandle(SessionHandler.java:223) [jetty-server-9.2.3.
v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.handler.ContextHandler.doHandle(ContextHandler.java:1125) [jetty-server-9.2.3.
v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.servlet.ServletHandler.doScope(ServletHandler.java:515) [jetty-servlet-9.2.3.v20140905.
jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.session.SessionHandler.doScope(SessionHandler.java:185) [jetty-server-9.2.3.
v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.handler.ContextHandler.doScope(ContextHandler.java:1059) [jetty-server-9.2.3.
v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.handler.ScopedHandler.handle(ScopedHandler.java:141) [jetty-server-9.2.3.v20140905.
jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.handler.ContextHandlerCollection.handle(ContextHandlerCollection.java:215) [jetty-
server-9.2.3.v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.handler.HandlerCollection.handle(HandlerCollection.java:110) [jetty-server-9.2.3.
v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.handler.HandlerWrapper.handle(HandlerWrapper.java:97) [jetty-server-9.2.3.
v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.Server.handle(Server.java:497) [jetty-server-9.2.3.v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.server.HttpChannel.handle(HttpChannel.java:311) [jetty-server-9.2.3.v20140905.jar:9.2.3.
v20140905]
  at org.eclipse.jetty.server.HttpConnection.onFillable(HttpConnection.java:248) [jetty-server-9.2.3.v20140905.
jar:9.2.3.v20140905]
  at org.eclipse.jetty.io.AbstractConnection$2.run(AbstractConnection.java:540) [jetty-io-9.2.3.v20140905.jar:
9.2.3.v20140905]
  at org.eclipse.jetty.util.thread.QueuedThreadPool.runJob(QueuedThreadPool.java:610) [jetty-util-9.2.3.
v20140905.jar:9.2.3.v20140905]
  at org.eclipse.jetty.util.thread.QueuedThreadPool$3.run(QueuedThreadPool.java:539) [jetty-util-9.2.3.v20140905.
jar:9.2.3.v20140905]
  at java.lang.Thread.run(Thread.java:745) [na:1.8.0_31]
Caused by: java.io.IOException: Broken pipe
  at sun.nio.ch.FileDispatcherImpl.writev0(Native Method) ~[na:1.8.0_31]
  at sun.nio.ch.SocketDispatcher.writev(SocketDispatcher.java:51) ~[na:1.8.0_31]
  at sun.nio.ch.IOUtil.write(IOUtil.java:148) ~[na:1.8.0_31]
  at sun.nio.ch.SocketChannelImpl.write(SocketChannelImpl.java:503) ~[na:1.8.0_31]
```

```
at org.eclipse.jetty.io.ChannelEndPoint.flush(ChannelEndPoint.java:172) ~[jetty-io-9.3.1.v20150714.jar:9.2.3.v20140905]
... 81 common frames omitted
ERROR 18:36:22.783 (velocity) Exception in macro #triples called at /views/resource.vsl[line 47, column 21]
Jan 30, 2017 6:36:22 PM org.glassfish.jersey.server.ServerRuntime$Responder writeResponse
SEVERE: An I/O error has occurred while writing a response message entity to the container output stream.
org.glassfish.jersey.server.internal.process.MappableException: org.apache.velocity.exception.
VelocityException: VelocimacroProxy.render() : exception VM = #triples()
at org.glassfish.jersey.server.internal.MappableExceptionWrapperInterceptor.aroundWriteTo
(MappableExceptionWrapperInterceptor.java:92)
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor.proceed(WriterInterceptorExecutor.java:162)
at org.glassfish.jersey.message.internal.MessageBodyFactory.writeTo(MessageBodyFactory.java:1130)
at org.glassfish.jersey.server.ServerRuntime$Responder.writeResponse(ServerRuntime.java:711)
at org.glassfish.jersey.server.ServerRuntime$Responder.processResponse(ServerRuntime.java:444)
at org.glassfish.jersey.server.ServerRuntime$Responder.process(ServerRuntime.java:434)
at org.glassfish.jersey.server.ServerRuntime$2.run(ServerRuntime.java:329)
at org.glassfish.jersey.internal.Errors$1.call(Errors.java:271)
at org.glassfish.jersey.internal.Errors$1.call(Errors.java:267)
at org.glassfish.jersey.internal.Errors.process(Errors.java:315)
at org.glassfish.jersey.internal.Errors.process(Errors.java:297)
at org.glassfish.jersey.internal.Errors.process(Errors.java:267)
at org.glassfish.jersey.process.internal.RequestScope.runInScope(RequestScope.java:317)
at org.glassfish.jersey.server.ServerRuntime.process(ServerRuntime.java:305)
at org.glassfish.jersey.server.ApplicationHandler.handle(ApplicationHandler.java:1154)
at org.glassfish.jersey.servlet.WebComponent.serviceImpl(WebComponent.java:473)
at org.glassfish.jersey.servlet.WebComponent.service(WebComponent.java:427)
at org.glassfish.jersey.servlet.ServletContainer.service(ServletContainer.java:388)
at org.glassfish.jersey.servlet.ServletContainer.service(ServletContainer.java:341)
at org.glassfish.jersey.servlet.ServletContainer.service(ServletContainer.java:228)
at org.eclipse.jetty.servlet.ServletHolder.handle(ServletHolder.java:769)
at org.eclipse.jetty.servlet.ServletHandler.doHandle(ServletHandler.java:585)
at org.eclipse.jetty.server.handler.ScopedHandler.handle(ScopedHandler.java:143)
at org.eclipse.jetty.security.SecurityHandler.handle(SecurityHandler.java:577)
at org.eclipse.jetty.server.session.SessionHandler.doHandle(SessionHandler.java:223)
at org.eclipse.jetty.server.handler.ContextHandler.doHandle(ContextHandler.java:1125)
at org.eclipse.jetty.servlet.ServletHandler.doScope(ServletHandler.java:515)
at org.eclipse.jetty.server.session.SessionHandler.doScope(SessionHandler.java:185)
at org.eclipse.jetty.server.handler.ContextHandler.doScope(ContextHandler.java:1059)
at org.eclipse.jetty.server.handler.ScopedHandler.handle(ScopedHandler.java:141)
at org.eclipse.jetty.server.handler.ContextHandlerCollection.handle(ContextHandlerCollection.java:215)
at org.eclipse.jetty.server.handler.HandlerCollection.handle(HandlerCollection.java:110)
at org.eclipse.jetty.server.handler.HandlerWrapper.handle(HandlerWrapper.java:97)
at org.eclipse.jetty.server.Server.handle(Server.java:497)
at org.eclipse.jetty.server.HttpChannel.handle(HttpChannel.java:311)
at org.eclipse.jetty.server.HttpConnection.onFillable(HttpConnection.java:248)
at org.eclipse.jetty.io.AbstractConnection$2.run(AbstractConnection.java:540)
at org.eclipse.jetty.util.thread.QueuedThreadPool.runJob(QueuedThreadPool.java:610)
at org.eclipse.jetty.util.thread.QueuedThreadPool$3.run(QueuedThreadPool.java:539)
at java.lang.Thread.run(Thread.java:745)
Caused by: org.apache.velocity.exception.VelocityException: VelocimacroProxy.render() : exception VM =
#triples()
at org.apache.velocity.runtime.directive.VelocimacroProxy.render(VelocimacroProxy.java:228)
at org.apache.velocity.runtime.directive.RuntimeMacro.render(RuntimeMacro.java:311)
at org.apache.velocity.runtime.directive.RuntimeMacro.render(RuntimeMacro.java:230)
at org.apache.velocity.runtime.parser.node.ASTDirective.render(ASTDirective.java:207)
at org.apache.velocity.runtime.parser.node.SimpleNode.render(SimpleNode.java:342)
at org.apache.velocity.Template.merge(Template.java:356)
at org.apache.velocity.Template.merge(Template.java:260)
at org.fcrepo.http.api.responses.StreamingBaseHtmlProvider.writeTo(StreamingBaseHtmlProvider.java:171)
at org.fcrepo.http.api.responses.StreamingBaseHtmlProvider.writeTo(StreamingBaseHtmlProvider.java:76)
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor$TerminalWriterInterceptor.invokeWriteTo
(WriterInterceptorExecutor.java:265)
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor$TerminalWriterInterceptor.aroundWriteTo
(WriterInterceptorExecutor.java:250)
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor.proceed(WriterInterceptorExecutor.java:162)
at org.glassfish.jersey.server.internal.JsonWithPaddingInterceptor.aroundWriteTo(JsonWithPaddingInterceptor.
java:106)
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor.proceed(WriterInterceptorExecutor.java:162)
at org.glassfish.jersey.server.internal.MappableExceptionWrapperInterceptor.aroundWriteTo
(MappableExceptionWrapperInterceptor.java:86)
... 39 more
```

```

Caused by: org.eclipse.jetty.io.EOFException
at org.eclipse.jetty.io.ChannelEndPoint.flush(ChannelEndPoint.java:192)
at org.eclipse.jetty.io.WriteFlusher.write(WriteFlusher.java:337)
at org.eclipse.jetty.io.AbstractEndPoint.write(AbstractEndPoint.java:128)
at org.eclipse.jetty.server.HttpConnection$SendCallback.process(HttpConnection.java:646)
at org.eclipse.jetty.util.IteratingCallback.processIterations(IteratingCallback.java:233)
at org.eclipse.jetty.util.IteratingCallback.iterate(IteratingCallback.java:193)
at org.eclipse.jetty.server.HttpConnection.send(HttpConnection.java:457)
at org.eclipse.jetty.server.HttpChannel.sendResponse(HttpChannel.java:769)
at org.eclipse.jetty.server.HttpChannel.write(HttpChannel.java:802)
at org.eclipse.jetty.server.HttpOutput.write(HttpOutput.java:139)
at org.eclipse.jetty.server.HttpOutput.write(HttpOutput.java:132)
at org.eclipse.jetty.server.HttpOutput.write(HttpOutput.java:347)
at org.glassfish.jersey.servlet.internal.ResponseWriter$NonCloseableOutputStreamWrapper.write(ResponseWriter.java:325)
at org.glassfish.jersey.message.internal.CommittingOutputStream.write(CommittingOutputStream.java:229)
at org.glassfish.jersey.message.internal.WriterInterceptorExecutor$UnCloseableOutputStream.write(WriterInterceptorExecutor.java:299)
at sun.nio.cs.StreamEncoder.writeBytes(StreamEncoder.java:221)
at sun.nio.cs.StreamEncoder.implWrite(StreamEncoder.java:282)
at sun.nio.cs.StreamEncoder.write(StreamEncoder.java:125)
at sun.nio.cs.StreamEncoder.write(StreamEncoder.java:135)
at java.io.OutputStreamWriter.write(OutputStreamWriter.java:220)
at java.io.Writer.write(Writer.java:157)
at org.apache.velocity.runtime.parser.node.ASTReference.render(ASTReference.java:491)
at org.apache.velocity.runtime.parser.node.ASTBlock.render(ASTBlock.java:72)
at org.apache.velocity.runtime.parser.node.ASTIfStatement.render(ASTIfStatement.java:87)
at org.apache.velocity.runtime.parser.node.ASTBlock.render(ASTBlock.java:72)
at org.apache.velocity.runtime.directive.Foreach.render(Foreach.java:420)
at org.apache.velocity.runtime.parser.node.ASTDirective.render(ASTDirective.java:207)
at org.apache.velocity.runtime.parser.node.ASTBlock.render(ASTBlock.java:72)
at org.apache.velocity.runtime.directive.VelocimacroProxy.render(VelocimacroProxy.java:216)
... 53 more
Caused by: java.io.IOException: Broken pipe
at sun.nio.ch.FileDispatcherImpl.writev0(Native Method)
at sun.nio.ch.SocketDispatcher.writev(SocketDispatcher.java:51)
at sun.nio.ch.IOUtil.write(IOUtil.java:148)
at sun.nio.ch.SocketChannelImpl.write(SocketChannelImpl.java:503)
at org.eclipse.jetty.io.ChannelEndPoint.flush(ChannelEndPoint.java:172)
... 81 more

```

Test 2 Conclusions

1. [blocked URL](#) Still some work to do to make round-trips possible, unless the representational differences are considered semantically identical because of the definition of `fedora.Container`, for example. It seems unnecessary to have the behavior diverge between `turtle` and `json+ld`, though.
2. [blocked URL](#) Datetimes still vary, a known issue, if I understand correctly.
3. [blocked URL](#) Unclear what effect the exceptions had on data, if any.

Comments:

- Generating a config implicitly and then using it on subsequent operations means that those who expect their command-line options to apply **only** for that command will be surprised.
- Generating a config to `/var` means that on certain OS, the config will be lost upon system restart. So those who **rely** on the persistence of previous command line options will also be surprised.
- Generating a config on first execution means that **order of operation** between otherwise independent calls matters (say, 3 calls, each exporting a different object with different options).
- I would recommend an explicit `--set-config` or `--write-config` option to eliminate these 3 categories of surprise.