

qudex- repository- tools

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Self-archiving toolkit for the Fedora
Repository

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TheTechnicalUsers

Technical support staff: installation and repository set up.

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QuDEX Repository Toolkit set up

If you are IT or technical support staff wishing to set up a digital repository and install the QuDEX Repository Toolkit this is the place for you!

Prerequisites

Before installing the QuDEX Repository Toolkit there are a number of systems that need to be installed a configured. Installation and configuration guides for these systems are not provided here. The systems are the following:

- [Fedora Digital Repository](#). The official installation and configuration guide for the digital repository is available [here](#).
- [Mulgara Semantic Database](#). The Project's wiki including documentation and installation/configuration guides is available [here](#).



Note

The Toolkit has been tested with the following versions of Fedora Repository and Mulgara respectively: 3.6.X, 3.5 and 3.4.2 (Fedora) and 2.1.X (Mulgara). It is recommended to use the latest versions of both systems, that is, 3.6.2 for Fedora and 2.1.13 for Mulgara.

Before installing the toolkit

Once both Fedora and Mulgara have been installed, there is some extra configuration that needs to be performed. Some of the key functionalities of the Toolkit rely on Fedora's [Resource Index \(RI\)](#) functionality. This functionality can be enabled during the installation of the repository. If it has not been enabled during installation, it can be enabled by editing the following line of Fedora's configuration file (fedora.fcfg)

```
<param name="level" value="1">
  <comment>(required)
    Index level. Currently, only 0, and 1 are supported levels.
    0 = off and 1 = on.
    WARNING: changing the level (except to 0) requires
    running the Resource Index Rebuilder.
  </comment>
</param>
```

Additionally, it can be useful to enable automatic update synchronisation of the Resource Index. This functionality allows to update Mulgara automatically every time that a new object has been added to the repository.

```
<param name="syncUpdates" value="true">
  <comment>(optional, default is false)
    Whether to flush the triple buffer before
    returning from object modification operations.
    Specifying this as true will ensure that RI queries
    immediately reflect the latest triples.
    Specifying false will not provide this guarantee,
    but can significantly reduce roundtrip time for
    API-M operations (depending on the triplestore
    implementation).
  </comment>
</param>
```

Mulgara configuration

Once the RI has been enabled, and automatic update has been set to true, Fedora needs to be configured to use an external Mulgara triplestore instance. By default Fedora uses an embedded Mulgara instance. To add more flexibility to the toolkit, it has been designed to work with an external Mulgara instance rather than with the one shipped with Fedora. This presents some advantages, highlighting overcoming triplestore size limitations and allowing for an independent use of the triplestore. To configure Fedora for its use with an external Mulgara instance the following section from Fedora's configuration file needs to be edited.

```
<datastore id="localMulgaraTriplestore">
  ...
  <param name="remote" value="true">
    <comment>
      Tells the connector to communicate with Mulgara in remote or
      local mode. If true, the host parameter must be defined. If false,
      the path parameter must be defined.</comment>
  </param>
  <param name="host" value="localhost"></param>
  ...
</datastore>
```

- Parameter **"remote"**. It needs to be set as true to indicate that the RI will rely on an external Mulgara server.
- Parameter **"host"**. It needs to be set with the name of the host where Mulgara is running.



The Mulgara library used in Fedora (located under the lib folder in Fedora web application folder) - mulgara-core-X.Y.Z.jar - needs to be replaced with the one shipped with the Mulgara version that has been installed. Mulgara distribution files can be downloaded from [here](#). This is because the version of the library included in Fedora web application may be different from the one included in the distribution of Mulgara that has been installed.

Toolkit's installation

The toolkit includes three different web applications that need to be deployed in an application server such as [Apache Tomcat](#).

- Template Builder
- Collection Manager
- Collection Explorer

The Qudex Repository can be installed in three different ways:

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- Installation from source using Apache Maven
- Run the installer that will deploy the application in a Tomcat container (multiplatform installer, Windows or Unix)
- Download the pre-compiled war files (to be deployed in Tomcat or in a Java-based application server)

Installation from Maven

The different applications included in the toolkit have been structured as Maven projects (Apache Maven Project Management Tool version 2.X). Before building the projects for each of the tools, that is, the Spreadsheet Builder, the Collections Manager and the Collection Explorer, each of the dependent Java libraries need to be built. The required libraries are the following (listed by order of compilation):

1. **fedora-restifz-lib** and **mulgara-ifz**. Set of libraries to manage connections and operations on Fedora repository and Mulgara triplestore. The two libraries provide web \ac{REST}-like interfaces to allow access to and perform different operations.
2. **oai-dc-beans**, **foxml-beans** and **qudex-beans**. Set of libraries implementing XML data management functionalities (FOXML Beans and QuDEx Beans). The toolkit applications work primarily with three different types of data: XML documents representing fedora objects (Fedora FOXML schema-based) and XML documents representing QuDEx instances.
3. **metadata-schemas-lib**. Set of libraries implementing other Metadata schemas management. The toolkit applications use metadata elements from Dublin Core schema and DDI2 Lite, among others. The management of these data is performed by a separate library.
4. **qudex-xml-lib**. Library implementing core management of QuDEx Repository Toolkit. It uses the other groups of libraries to implement all the operations needed to perform collection creation, ingestion and updating in the repository.

To simplify this process in the future, it is expected to group all these required libraries into a single Maven Project so that the building process only has to be performed once. To build up each of the individual libraries use the following Maven command from command line:

```
mvn clean install
```

QuDEx Template Builder

This application is the simplest to install since there is no configuration needed prior to deploy the application into an Application server like Apache Tomcat. To build up the project from command line, the following command is needed:

```
mvn clean install
```

QuDEx Collections Manager

This application can be built using two different profiles: a) installer and b) no-installer. The first one outputs a multiplatform installer that will allow to install the web application in an existing Tomcat container. The second maven profile option will generate the application war archive that can be deployed manually in the Tomcat container.

The command line commands to build the application are as follows.

```
mvn -Dhostname=$HOSTNAME -P no-installer clean install
mvn -Dhostname=$HOSTNAME -P installer clean install
```

Before building the project from command line some configuration is needed. The web application deploys a configuration file. These parameters have to be substituted with the ones according to the deployment environment. The configuration file that needs to be modified before building the application is named "filter-prod.properties" and it is located in the folder (location relative to Project folder): src/filters.

Configuration Parameters description

Parameter Name	Description	Example
fedora.version	Version number of the installed Fedora Repository	3.6.2
fedora.service	URL of the Fedora service installed in Tomcat	http://localhost/fedora
fedora.user	Fedora administrator username	"FedoraAdmin"
fedora.password	Fedora administrator password	N/A
fedora.fileServletUrl	File management servlet URL. The relative path from the application is "file". This parameter is specific to the web application and unless the path of the web application deployed in the Tomcat container changes (default: swf-qudex-collections). The default value has to be used	http://localhost/swf-qudex-collections/file
mulgara.sparqlservice	URL to the HTTP Mulgara Sparql Rest Service	http://localhost/mulgara/sparql
mulgara.graphURL	Mulgara Graph URI. This URI is the model container of a given Mulgara instance.	rmi://localhost/fedora, where all the graphs are relative from this URL and specified using "#". E.g. Fedora RI: rmi://localhost/fedora#ri
mulgara.tqlservice	URL to the HTTP Mulgara TQL Rest service	http://localhost/mulgara/tql
mulgara.fedoragraph	Mulgara URI of the configured Fedora Resource Index Graph	rmi://localhost/fedora#ri
log4j.level	The application using Log4j logging. This parameter specifies the desired log level for the application	Accepted values, from Log4j documentation: "Debug", "error", "info", "warn", "fatal", "off" and "all"

```
#Configuration for testing the application on LOCALHOST
#Fedora versin number
fedora.version=3.6.2
#URL to access the Fedora service
fedora.service=http://localhost:8080/fedora
#Fedora administrator username
fedora.user=fedoraAdmin
#Fedora administrator password
fedora.password=thePassword
#URL for the File servlet that is part of the application, this is the full URL of the application
```

```
# + the relative path to the servlet which is "/file"
fedora.fileServletUrl=http://localhost:8080/swf-qudex-collections/file
#URL to Mulgara SPARQL HTTP REST interface
mulgara.sparqlservice=http://localhost:8091/sparql/
#URL to Mulgara iTQL HTTP REST interface
mulgara.tqlservice=http://localhost:8091/tql/
#Fedora RI graph URI (the protocol of this URI is rmi)
mulgara.fedoragraph=rmi://localhost/fedora#ri
#Mulgara default root graph URI (the protocol of this URI is rmi)
mulgara.graphURL=rmi://localhost/fedora#
#Log4J logging level
log4j.level=debug
```

Caption: sample filter-prod.properties

QuDEx Collections Manager: Email functionality configuration

One of the functionalities of the web application is the possibility of sending emails with the repository operations results. In order to use this capability the application has to be configured with the server's email settings. Details on how to configure an email server in application's host machine are not provided in this guide since they depend on the operating system and the email software used. The Spring bean for email capabilities needs to configure the following parameters:

- The parameter "mail.host" represents the email host address, for example: 'smtp.domain-name.com'.
- The parameter "mail.port" represents the port used by the email server.
- The parameter "mail.from" represents the mail address used to send the confirmation emails.
- The parameter "mail.user" represents the username used to login in the mail server (if needed, depends on the mail server's configuration).
- The parameter "mail.password" represents the password for the username associated with the mail server (empty value if no login is required).
- The parameter "mail.smtp.auth" represents whether the process of sending emails requires authentication (username and password required to send emails).
- The parameter "mail.smtp.starttls.enable" represents whether to switch the connection to a TLS-protected if using authentication when connecting to the email server.

These properties are defined in the file "mail.properties", stored in the classes folder within the deployed web application. These parameters need to be changed according to the specific configuration of the email server used.

QuDEx Collection Explorer

This application can be built using two different profiles: a) installer and b) no-installer. The first one outputs a multiplatform installer that will allow to install the web application in an existing Tomcat container. The second maven profile option will generate the application war archive that can be deployed manually in the Tomcat container.

The command line commands to build the application are as follows.

```
mvn -Dhostname=$HOSTNAME -P no-installer clean install
mvn -Dhostname=$HOSTNAME -P installer clean install
```

Before building the project from command line some configuration is needed. The web application deploys a configuration file. These parameters have to be substituted with the ones according to the deployment environment. The configuration file that needs to be modified before building the application is named "filter-prod.properties" and it is located in the folder (location relative to Project folder): src/filters.

Configuration Parameters description

Parameter Name	Description	Example
fedora.server	URL of the Fedora service installed in Tomcat	http://localhost/fedora
mulgara.sparqlservice	URL to the HTTP Mulgara Sparql Rest Service	http://localhost/mulgara/sparql
mulgara.serverURI	Mulgara Default Graph URI. This URI is the model container of a given Mulgara instance.	rmi://localhost/fedora, where all the graphs are relative from this URL and specified using "#". E.g. rmi://localhost/fedora#
mulgara.tqlservice	URL to the HTTP Mulgara TQL Rest service	http://localhost/mulgara/tql
mulgara.output.format	Default output format of Mulgara SPARQL REST interface	This value should not be modified and it should be set up as json .
mulgara.fedoragraph	Mulgara URI of the configured Fedora Resource Index Graph	rmi://localhost/fedora#ri
template.server	URL to Tomcat container	http://localhost:8080
template.script	URL to Apache Server where the simile javascript extensions is installed (simile folder which can be downloaded from here)	http://localhost
log.name	This parameter specifies the name of the log4J file for the application	N/A
log4j.level	The application using Log4j logging. This parameter specifies the desired log level for the application	Accepted values, from Log4j documentation: "Debug", "error", "info", "warn", "fatal", "off" and "all"
log.name	This parameter specifies the name of the log4J file for the application	N/A
log.package	This is the java package for which log information will be logged.	Accepted values: any package path included in the QuDEx servlet application.

```
#URL to Mulgara SPARQL HTTP REST interface
mulgara.sparqlservice=http://localhost:8091/sparql/
#URL to Mulgara iTQL HTTP REST interface
mulgara.tqlservice=http://localhost:8091/tql/
#Fedora RI graph URI (the protocol of this URI is rmi)
mulgara.fedoragraph=rmi://localhost/fedora#ri
#Mulgara default root graph URI (the protocol of this URI is rmi)
mulgara.serverURI=rmi://localhost/fedora#
#Mulgara REST service default output format for queries: json
mulgara.output.format = json
fedora.server = http://ensembletest.ljmu.ac.uk/fedora
#AMG Added to parameterize Sparql Queries
#URL of the server hosting Fedora
```

```
template.server = http://localhost
#URL of Apache Server
template.script = http://localhost
#Log4j parameters
log4j.level=debug
#The log filename
log.name=qudex-sparql-WS.log
#Do not modify
log.package=uk.ljmu.qudex.qudexservlet
```

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Caption: sample filter-prod.properties

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Installation

Installation guide(s) *Template/Collection manager*

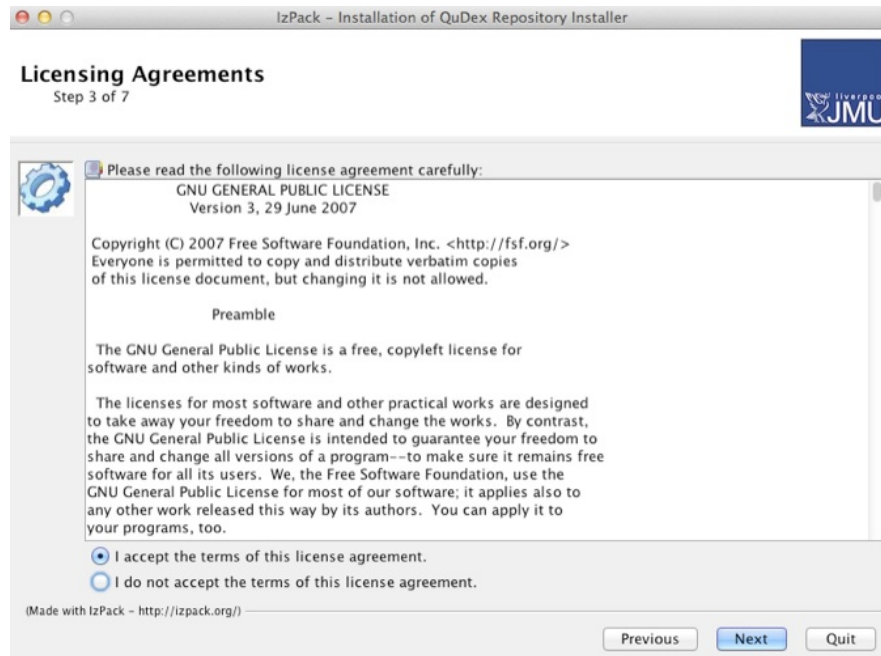
Updated Yesterday (23 hours ago) by [amg...@gmail.com](#)

Toolkit Installation from installer

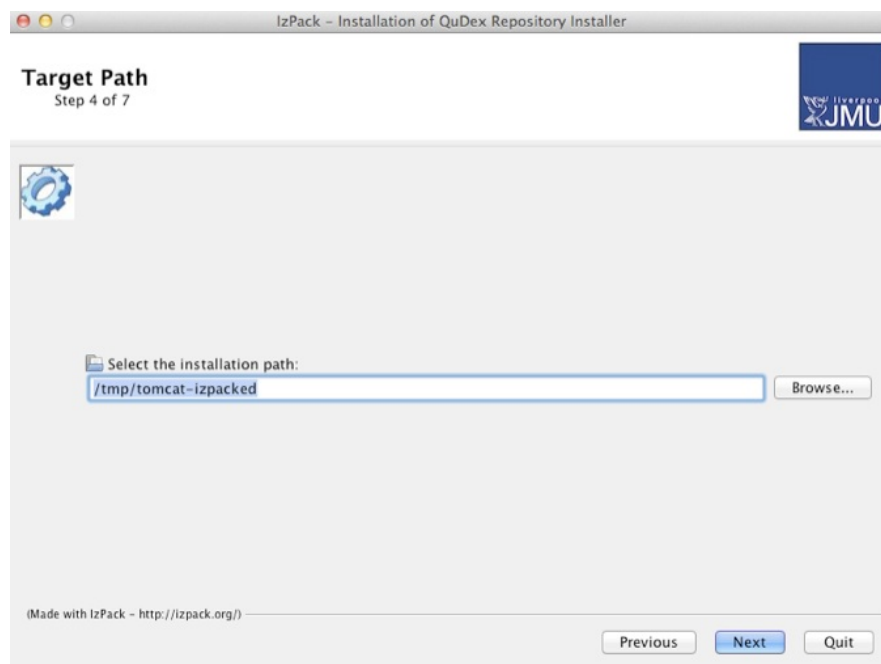
The web application can be automatically deployed in a running Tomcat container by using a multiplatform installer. The installation process is quite simple and it only requires selecting the path of the temporary folder for the installation itself and introducing the values for the configuration parameters described above. The installer will add those parameters to the web application war file and will deploy it in the system's Tomcat container.

Installation Steps

1. License Agreement




2. Installation Path



3. Specify Application configuration parameters

IzPack – Installation of QuDex Repository Installer

User Data
Step 5 of 7

 **Configure the Web Application**

Enter the Tomcat base URL:

Enter the Fedora application path in tomcat:

Enter the Fedora Admin Username:

Fedora admin Password:

Retype Password:

Enter the Mulgara Sparql Service Url:

Enter the Mulgara Tql Service Url:

Enter the Mulgara Fedora RI URI:

Enter the Mulgara base graph RI URI:


(Made with IzPack – <http://izpack.org/>)

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4. Installation Progress

IzPack – Installation of QuDex Repository Installer

Installation
Step 6 of 7



⚙ Pack installation progress:
/tmp/tomcat-izpacked/work/deploy-webapp.sh
Install Web Application Unix

⚙ Overall installation progress:
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(Made with IzPack – <http://izpack.org/>)

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