Creating Custom Collection Objects

If you want to change the nature or behavior of Collection Objects in Islandora, you can create a custom collection object which will override the default behavior of Islandora. For example, you can return objects that have a different relationship to the collection object, you can present objects in your collection in a custom way to your viewer, and you can create security policies that will restrict access to the items in your collection (overriding Fedora’s default security behavior).

A simplified overview of Collection Objects is provided in the introduction of this guide, but the following chapter provides more information about the default behavior of Islandora, how Collection Objects can be constructed, and how they can be extended and customized.

Overview:

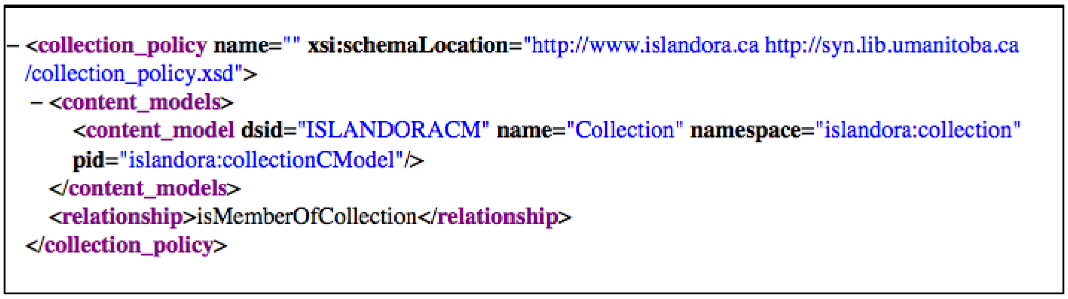
Collection Objects have one mandatory Datastream (COLLECTION_POLICY) and several optional Datastreams. The optional Datastreams override the default behavior of Islandora. You may add Datastreams by navigating to the collection object you wish to modify, and then adding Datastreams via the interface. You may also add these Datastreams using any Fedora tool that you are familiar with.

- COLLECTION_POLICY*
- QUERY
- COLLECTION_VIEW
- CHILD_SECURITY: gives a POLICY Datastream to child objects

**Mandatory*

COLLECTION_POLICY

A Collection Object can have four Datastreams, although the COLLECTION_POLICY is the only mandatory stream. If you do not have a COLLECTION_POLICY Datastream, additional objects cannot be ingested as members of that collection object. In other words, in order to add items to a collection or sub-collection, the collection object (or **"parent-type" object**) must have a COLLECTION_POLICY stream. Here is an example of a COLLECTION_POLICY Datastream (as viewed using the Islandora interface to view in a browser).



```
– <collection_policy name="" xsi:schemaLocation="http://www.islandora.ca http://syn.lib.umanitoba.ca
  /collection_policy.xsd">
  – <content_models>
      <content_model dsid="ISLANDORACM" name="Collection" namespace="islandora:collection"
      pid="islandora:collectionCModel"/>
    </content_models>
    <relationship>isMemberOfCollection</relationship>
  </collection_policy>
```

The COLLECTION_POLICY Datastream must have a isMemberOfCollection relationship declared, and must be associated with the islandora:collectionCModel.

This relationship statement tells Islandora that this Fedora object is a collection object. Islandora can then find all child objects of this collection by querying the resource index for Fedpra objects that have a relationship of isMemberOfCollection to this collection object.

The isMemberOfCollection is the default relationship used by Islandora, but other relationships can be used by declaring that relationship in the COLLECTION_POLICY Datastream. If you use another relationship other than this relationship, you will have to use a QUERY Datastream as well. (In other words, any new relationship declared in the COLLECTION_POLICY Datastream will make the QUERY Datastream mandatory.)

If you wish to create a new COLLECTION_POLICY stream, you will be writing XML. One way to do this is to start with an example collection policy (there is one available in ... [supply an example]) and edit it. The **DSID** of this datastream must be COLLECTION_POLICY.

QUERY

A QUERY Datastream is an iTQL query that overrides Islandora’s default iTQL query. If you have declared different relationships (not a hasModel relationship) in your COLLECTION_POLICY Datastream, you will have to write a custom QUERY stream to return these relationships. In order to do this, you will have to have an understanding of iTQL. Resources for learning iTQL are offered in the Bibliography for this guide. Your iTQL query must return SPARQL XML to be parsed by the default collection view xslt file, or by a custom COLLECTION_VIEW xslt that you have written yourself.

When you write a QUERY Datastream, you ask the Islandora module to retrieve items that have a different set of objects related to your collection object from those in the default ITQL query. The default iTQL query is located in the islandora module in the collection_class.inc file. This is the query:

```
$query_string = '
select $object $title $content
from <#ri>
where ($object <dc:title> $title
and $object <fedora-model:hasModel> $content
and ($object <fedora-rels-ext:isMemberOfCollection> <info:fedora/' . $pid . '>
or $object <fedora-rels-ext:isMemberOf> <info:fedora/' . $pid . '>)
and $object <fedora-model:state> <info:fedora/fedora-system:def/model#Active>)
minus $content <mulgara:is> <info:fedora/fedora-system:FedoraObject-3.0>
order by $title
';
```

Note that if you write a QUERY Datastream, you may also have to write a COLLECTION_VIEW Datastream to parse and display your results. Sample QUERY Datastreams are provided in the Resources section of this guide.

COLLECTION_VIEW

Every Solution Pack comes with a default XSLT that controls how objects associated with that SP are displayed. This XSLT is called from the Islandora module at object_helper.inc.

If you want want to change the way objects are displayed in a collection, you can override the default XSLT by putting one of your own and in a COLLECTION_VIEW datastream in the collection object.The XSLT in your COLLECTION_VIEW datastream has to be designed to parse the SPARQL XML returned by either the default iTQL query used by Islandora (and found in the Islandora module under sparql_2_html.xsl) or by a custom query you have put into a QUERY datastream in the collection object. For a custom XLST used for a COLLECTION_VIEW Datastream, please refer to the Samples and Resources section.

CHILD_SECURITY

CHILD_SECURITY is an optional Datastream of a collection object. It is a hand-written eXtensible Access Control Markup Language (XACML) policy that defines security at the collection level. To learn more about XACML, visit our resources section.

The CHILD_SECURITY Datastream overrides whatever default security you have configured as part of your Fedora and Drupal installations (see the Fedora installation section of this document, particularly information about global XACML policies). For example, if objects in your Fedora repository are, by default, available to the public, you may wish to write a CHILD_SECURITY stream for a collection to restrict access to that collection to specific users or to specific **Drupal Roles**. In order to use the CHILD_SECURITY stream effectively, you may wish to review the Islandora and Security section of this guide.

All of the objects that are ingested as members of a collection object that has a CHILD_SECURITY stream will have a POLICY stream. Without the POLICY Datastream, the objects default to your base security configuration. This means that if you add a CHILD_SECURITY stream to an object after items are already affiliated with the collection, these objects will not adopt the CHILD_SECURITY policies (and they will have no POLICY Datastreams).

Note that Islandora does not change the UI in the case where a POLICY Datastream exists. This means that the icons for managing objects (such as the purge option) will still be available to users. However, if users attempt to perform the action and they do not have permissions corresponding to that action, they will receive an error. We are hoping that future versions of Islandora will not have this limitation.

Generating XACML Policies

XACML Editor

Non-developers may want to use the XACML Editor module to generate XACML policies using a graphical user interface. Further instructions for this module are found in Chapter 5: Using the XACML Editor

User-Generated XACML

Hand-written XACML policy files can be added to the $FEDORA_HOME/data/ fedora-xacml-policies/repository-policies. You can retrieve an example XACML policy file from the Samples & Resources section of the guide. Please not that this example opens API-M to all of the users in your Drupal instance that are authenticated users.

When you write a CHILD_SECURITY stream you are writing a XACML policy. That XACML policy must be parseable (usable) by Islandora's simple parser. Islandora's simple parser expects the CHILD_SECURITY Datastream to contain a XACML policy that denies access to all users, and then provides exceptions for users with certain **Drupal Roles**, or User IDs. If users have IDs or roles that are permitted access in the XACML policy, they will be allowed to ingest, view, or modify elements in that collection. The sample XACML policy in the Samples & Resources section of this document is annotated and can act as a starting point for a collection-object CHILD_SECURITY Datastream.

In order for Islandora to be able to browse collections, your collection object must also have a hasModel entry in the RELS-EXT Datastream that points to islandora:collectionCModel. This lets the module know that the object represents a collection and it will then query for objects that are members of this collection.