

## Chapter 4 - Search & Discovery in Islandora

Islandora uses Solr and the Solr module in combination with GSearch to provide search functions to users on your site. This chapter assumes either:

- a) You are using the **Virtual Machine Image**, or are exploring Islandora via Sandbox (where Solr is already installed and configured)
- b) Solr and Gsearch are installed (following the instructions in [Chapter 8 - Installing Solr and GSearch](#)), and you have installed and activated the Solr module. The xslt and solrschema.xml documents that come packaged with [GSearch](#) should be used in configuration. These files are designed to work with our solution packs. Guidance for creating customizations to Solr are provided in the [Customizing GSearch and Solr](#) section.

What is Solr? And, why should I use it?

Solr makes it easy to create advanced search features in Islandora, like faceting (arranging search results in columns with numerical counts of key terms). The following comes from the Solr guide; a link to the guide is provided in the Selected Reading section of this guide:

*Solr builds on another open source search technology---Lucene, a Java library that provides indexing and search technology, as well as spellchecking, hit highlighting and advanced analysis/tokenization capabilities. Both Solr and Lucene are managed by the Apache Software Foundation ([www.apache.org](http://www.apache.org)).*

*The Lucene search library currently ranks among the top 15 open source projects and is one of the top 5 Apache projects, with installations at over 4,000 companies. Lucene/Solr downloads have grown nearly 10x over the past three years, with a current run-rate of over 6,000 downloads a day.*

Islandora uses Solr to make objects in your Islandora installation discoverable. The Solr search module uses an XSLT in Gsearch to index the **FOXML** documents in your repository, and allows you to configure search fields for searching and faceting. Whenever you add a new object in Fedora, the Solr module updates your index, and makes those results available to your users.

### Solr “Out of the Box”

The Solr module comes with support for DC and MODS searching and faceting to support our solution packs. When Solr is installed, six additional blocks appear under Structure>Blocks:

⊕ Islandora simple search	Second sidebar ▾	<a href="#">configure</a>
⊕ Islandora advanced search	Second sidebar ▾	<a href="#">configure</a>
⊕ Islandora query	Second sidebar ▾	<a href="#">configure</a>
⊕ Islandora facets	Second sidebar ▾	<a href="#">configure</a>
⊕ Islandora sort	Second sidebar ▾	<a href="#">configure</a>
⊕ Islandora displays	Second sidebar ▾	<a href="#">configure</a>

**Islandora simple search** - provides a simple full-text search of all items in the repository. A term will appear, no matter where it appears in the metadata.

**Islandora advanced search** - provides a configurable search for users, where specific metadata fields can be searched and combined with boolean operators.

**Islandora query** - when a user is viewing a set of search results by facet, this block will show the current filters being applied in the search.

**Islandora facets** - this block will show users the facets they can use to explore search results.

**Islandora displays** - displays current search query

**Islandora sort** - displays sorting options for search results.

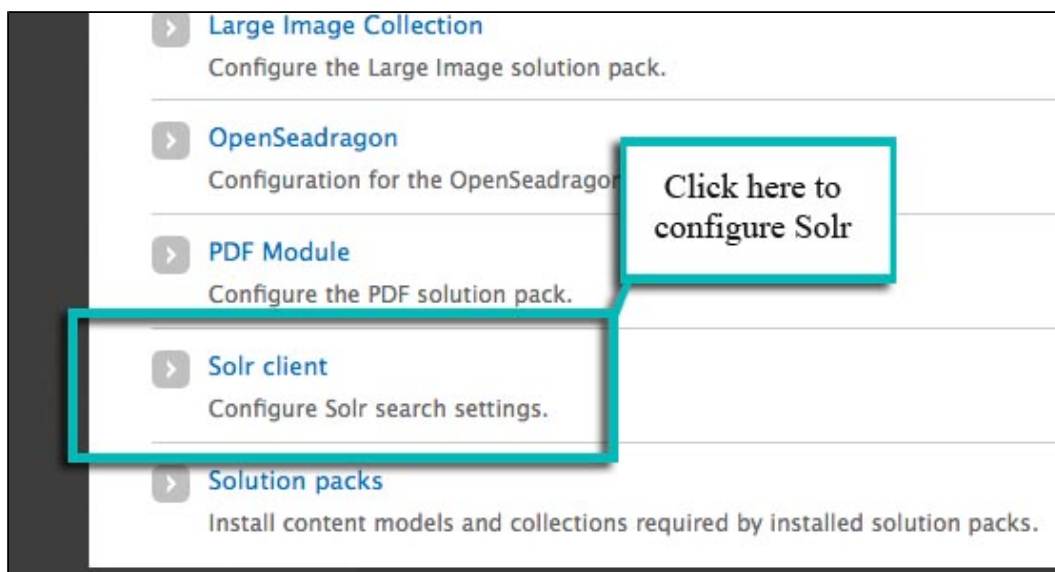
By placing these blocks in regions of your site and configuring the Solr module under Islandora>Solr client, you can facilitate both full-text searching and faceted searching of items ingested using Solution Packs. The basic configuration of Solr can be modified to change the weight of search fields, and extend the out-of-the-box functionality. Information for doing this is provided in [Chapter 7 - Customizing Islandora](#).

### **Configuring Solr out-of-the Box**

In order for Solr to work for your collections, you will have to activate the blocks that you want, and configure them to display your desired results. The following instructions will show you how to configure Solr to work with solution packs. Additional information about installing Solr and how Islandora uses Solr is provided in [Chapter 9 - Installing Solr and GSearch](#). Additional information about customizing Islandora's Solr Search Module is provided in [Chapter 7 - Customizing Islandora](#).

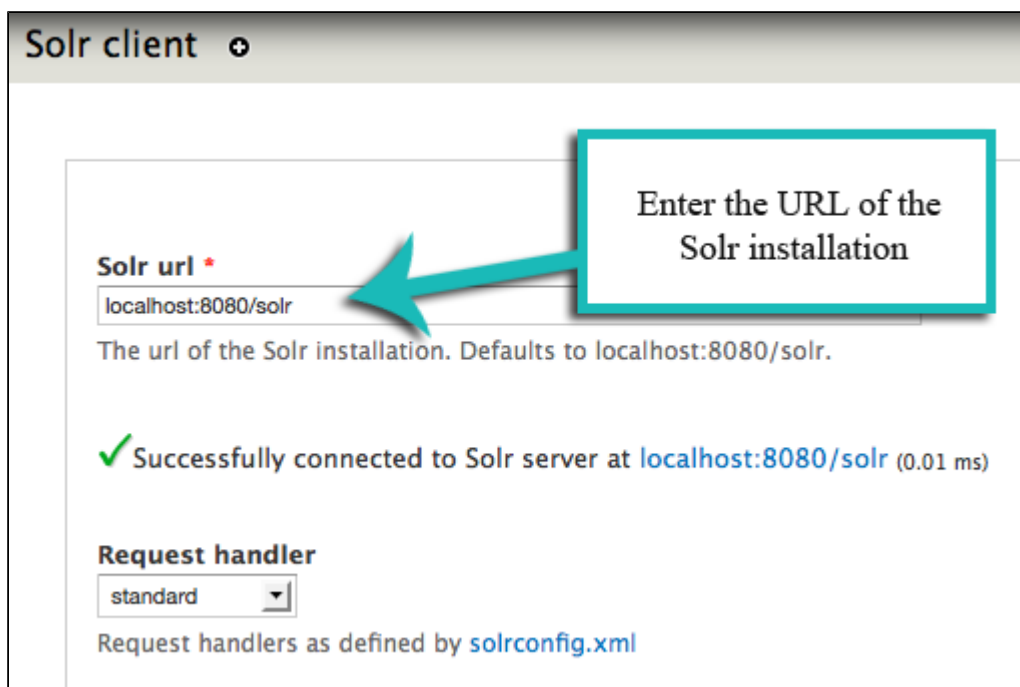
#### **1. Navigate to the Configuration Panel**

Start by going to the 'Islandora' page in the admin panel and click on the 'Solr Client' link.



## 2. Verify the Solr URL and Request Handler

The Solr URL should be ip.address.of.site:port/solr. So, for example, if you're using the Islandora Virtual Machine Image, your Solr URL should be 192.168.56.195:8080/solr, or if using a local installation it should be localhost:8080/solr. If the URL is correct you will see a green check mark.



The screenshot shows the 'Solr client' interface. At the top, there's a header 'Solr client' with a small icon. Below it, there's a section for 'Solr url \*' with a text input field containing 'localhost:8080/solr'. A red box with a red border and a red arrow points to this input field, containing the text 'Enter the URL of the Solr installation'. Below the input field, there's a description: 'The url of the Solr installation. Defaults to localhost:8080/solr.' Below this, there's a green checkmark icon followed by the text 'Successfully connected to Solr server at localhost:8080/solr (0.01 ms)'. Below that, there's a section for 'Request handler' with a dropdown menu showing 'standard'. Below the dropdown, there's a description: 'Request handlers as defined by solrconfig.xml'.

**Solr client**

**Solr url \***

localhost:8080/solr

The url of the Solr installation. Defaults to localhost:8080/solr.

✓ Successfully connected to Solr server at localhost:8080/solr (0.01 ms)

**Request handler**

standard

Request handlers as defined by solrconfig.xml

Make sure the request handler is set to 'standard'. You can customize the request handler by editing *solrconfig.xml* to make other request handlers available. This assumes that you are using the default request handler, which will support all the metadata in our solution packs.

### 3. Set the Default and Secondary Display Profiles

You can modify the way results are displayed by configuring the default display profile. You can choose from List (default), Bookmark, Grid, and Table. Switching back and forth between different display profiles is simple, so feel free to experiment and see which profile best suits your site.

Secondary display profiles provide optional secondary outputs for search results. Out-of-the-box, support for CSV output is provided. Selecting this option will place a CSV button next to your search results.

DISPLAY PROFILES

Primary display profiles

Show row weights

DEFAULT	ENABLED	NAME	MACHINE READABLE NAME	CONFIGURATION
<div><div>+</div><div>○</div></div>	<input type="checkbox"/>	Bookmark	bookmark	
<div><div>+</div><div>●</div></div>	<input checked="" type="checkbox"/>	List (default)	default	
<div><div>+</div><div>○</div></div>	<input type="checkbox"/>	Grid	grid	
<div><div>+</div><div>○</div></div>	<input type="checkbox"/>	Table	table	

Preferred normal display profiles for search results are provided by third-party modules.

Secondary display profiles

☐ CSV

Allow search results to be exported to CSV

Enabled secondary output/download types for search results.

#### 4. Updating Default Display Settings

The default display settings are used to define the fields that will display for your search results.

Default display settings

Sort settings

Facet settings

Advanced search block

Query defaults

Required Solr fields

Other

Display fields

SOLR FIELD	SETTINGS
No fields defined	
Add another item	
dc.title	(text_en_splitting)

Add

Set labels for Solr fields to be included in the search results.

☐ Limit results to fields listed above?

If checked, results displayed will be limited to the fields specified above. The order of the display fields is only enforced when this is enabled.  
Note: some display profiles may not honour this value.

Results per page

20

The number of results to show per page.

Save Solr configuration

Reset to defaults

Enter a field that is indexed.  
A type ahead appears with fields in your index that match. Select **Add**.

Once you've added a field, there is a configuration option available for the field. You can enter a label for the field, adding linking, term highlighting and permissions.

Configure field: dc.title

Label

Title

A human-readable name.

Linking

☐ None

☒ Link this field to the object's page.

☐ Link the value to a Solr search result. (NOTE: Will likely break with very large values.)

☐ Highlight

If a match is found on this field, the search term will be highlighted.  
Note: Only text that has been both indexed and stored may be highlighted. While highlighting on non-tokenized fields is possible, the best results are achieved using tokenized fields. This checkbox may be grayed out if the Solr field cannot be highlighted.

PERMISSIONS

Apply

Enter a label for the field.  
You can link the field  
to the object.

Continue adding and configuring fields. You will want to limit your display to the fields you have defined. Ensure that you save the configuration.



The screenshot shows the Solr configuration interface. On the left is a sidebar with navigation links: Default display settings, Sort settings, Facet settings, Advanced search block, Query defaults, Required Solr fields, and Other. The main area is titled 'Display fields' and contains a table with columns 'SOLR FIELD', 'SETTINGS', and 'OPERATIONS'. The first row shows 'dc.title' with a 'Label: Title' and 'configure'/'remove' links. Below the table is an 'Add another item' button. Further down, there is a checkbox for 'Limit results to fields listed above?' with explanatory text. Below that is a 'Results per page' section with a value of '20'. At the bottom are 'Save Solr configuration' and 'Reset to defaults' buttons. Three callout boxes with arrows provide instructions: one points to the 'Add another item' button, another points to the 'Limit results to fields listed above?' checkbox and the 'Results per page' field, and a third points to the 'Save Solr configuration' button.

Default display settings

Sort settings

Facet settings

Advanced search block

Query defaults

Required Solr fields

Other

Display fields

SOLR FIELD	SETTINGS	OPERATIONS
dc.title	Label: Title	configure remove

Add another item

Set labels for Solr fields to be included in the search results.

☐ Limit results to fields listed above?  
If checked, results displayed will be limited to the fields specified above. Note: some display profiles may not honour this value.

Results per page  
20  
The number of results to show per page.

Save Solr configuration Reset to defaults

Add more fields using the same method.

You should limit the results to the fields you've defined. You can also set the number of results to display per page.

Don't forget to **Save**.

## 5. Choose Search Terms in Advanced Search Block

Here you can choose the search terms that will appear in the drop-down menus on the advanced search block. Terms must be entered by their field names (in most cases this will be **Dublin Core**), though you can optionally specify a more human-readable label with the **configure** option. To determine the appropriate syntax for your search terms, simply edit the metadata on any object in your repository (for instructions, see [How to Edit an Object's Metadata in Chapter 3 - Getting Started with Islandora](#)). Each field label will display the proper syntax for adding it to your Solr search configuration. A full list of the terms made available by the schema provided in the module package is provided in [APPENDIX D - SOLR SCHEMA \(SEARCH\) Term Reference](#). Note that you will want to use fields that have been indexed as "text" here.

Default display settings

Sort settings

Facet settings

**Advanced search block**

Query defaults

Other

Search

SOLR FIELD	SET	LABELS	OPERATIONS
dc.title		Label: Title	configure remove
dc.subject			configure remove

Add another item

Add

Indicate what fields should appear in the dropdown menu of terms for the Advanced Search Block.  
Note: It is recommended to use tokenized fields.

**Default boolean operator**

☒ User configurable

☐ AND

☐ OR

Select a default boolean operator for the search query. User configurable exposes a dropdown which gives the user the choice between AND, OR and NOT.

You also have the option of setting permissions on a per-field basis, allowing only certain subsets of users access to search across different facets. These permissions, and the human-readable label for each Solr field, can be configured by clicking **configure** to open a new options window:

Solr field permissions are dependent on a role having Drupal permissions to search the Solr index. Roles without this permissions may appear in this list, but they will not be selectable.

## 6. Choose Facet Fields

Solr uses **faceting** to filter search results. Here, you can choose which fields you wish to allow faceting on. The format is the same as the search terms described above. You can also use this screen to configure:

1. **Minimum Limit** - The minimum number of search results returned for a particular facet before that facet will be displayed. For instance, if the limit was set to '3' and a

search for "fish" returned only two results for 'Bass', 'Bass' would not be included as a facet.

2. **Soft Limit** - The number of facets to show when a search is first returned. This setting will return the most populous facets first, and include a button to expose more available facets.
3. **Maximum Limit** - Similar to a Soft Limit, but without the option to expand to show more terms beyond the limit set here.

[Default display settings](#)[Sort settings](#)[Facet settings](#)[Advanced search block](#)[Query defaults](#)[Other](#)

### Facet fields

Show row weights

SOLR FIELD	SETTINGS	OPERATIONS
✚ dc.title		<a href="#">configure</a> <a href="#">remove</a>

Add another item

Add

Indicate what fields should appear in as facets.  
Note: it is recommended to use non-tokenized solr fields (full literal strings).

1 **Minimum limit**  
2  
Minimum results required to display a facet

2 **Soft limit**  
10  
The number which should be displayed initially. If there are more, then the a "Show more" button will allow the rest up to the value below to be displayed. Use 0 to disable.

3 **Maximum limit**  
20  
Set the maximum number of terms that should be returned to the user. For example, if there are 100 possible subjects in a faceted result, you may wish to return only the top 10.

Note that you will want to use terms here that have been indexed as “strings” (see Appendix).

## 7. Choose Sort Fields

Using the same field formatting as Advanced Search and Faceting fields, you can select fields to make available to the user to sort their search results in the Sort block.

Default display settings

**Sort settings**

Facet settings

Advanced search block

Query defaults

Other

### Sort fields

Show row weights

SOLR FIELD	SETTINGS	OPERATIONS
✚ dc.title		configure remove
✚ dc.subject		configure remove

Add another item

Add

Indicate what fields should appear in the Islandora sort block. To sort on relevancy, use the 'score' field.  
**Note:** not all fields are sortable. For more info check the [Solr documentation](#).

The field for a relevance based sort is "score"

## 8. Set Query Defaults

This section of the configuration panel provides advanced Solr query customization options:

- **Limit results to specific namespaces-** restrict your search results to a particular namespace. This is useful if there are multiple sites using the same repository and you want to block search results from the other sites. Remember that the namespace is the first half of the PID – everything before the colon.

- **Solr Default Query** - This option allows you to specify a default query used to browse results when no explicit query has been entered. For example, if a user runs a search and then deletes their search term from the breadcrumbs, this default query will be applied in its place.
- **Solr Base Filter** - You can use this option as a blanket way to filter all Solr search queries. For example, you can apply date-based or collection-based restrictions. For more information on Solr, see the [Solr Reference Guide](#).

The screenshot displays the Solr configuration web interface. On the left, a sidebar contains a list of configuration categories: 'Default display settings', 'Sort settings', 'Facet settings', 'Advanced search block', 'Query defaults' (highlighted with a red rectangle), and 'Other'. The main content area is divided into three sections:

- Limit results to specific namespaces:** A text input field is present, followed by a description: "Enter a space or comma-separated list of namespaces ie 'demo, default' to restrict results to PIDs within those namespaces."
- Solr default query:** A text input field contains the query "timestamp:[\* TO NOW]". Below it, a description states: "A default query to use to browse solr results when no explicit user query is set. Setting a useful default query allows users to use solr to browse, without entering a query themselves. May be used in conjunction with a background filter, below. Consider timestamp:[\* TO NOW] or \*:\*"
- Solr base filter:** A large text area for entering filters. Below it, a description reads: "Some base filters to append to all user queries -- may be used to filter results and to facilitate null-query browsing. Enter one per line. These filters will be applied to all queries in addition to any user-selected facet filters"

**You have successfully configured your Solr client.**