KE EMu Documentation

KE Software Portal

Document Version 1

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SECTION 1

Introduction

KE Software's Portal provides searching and collation of data from multiple sources simultaneously. Data Sources can be both internal and external to an institution, and include EMu, DiGIR and OAI, with the potential for many more.

The Portal has two modes of operation. At its core it is an XML query engine, comprising two customizable XML *responses*:

1. Query information: what data sources the Portal recognizes, what fields can be queried, etc.
2. Query response: what is returned in response to a query; this includes general information about the sources, a list of fields provided by the sources and a list of matching records.

This core XML component can be plugged in to another web or computer system as its data collection engine.

On the other hand, through implementation of XSL styling, the XML engine is a fully-fledged browser-based Search and Display utility for accessing multiple Data Sources. This is the default configuration of the Portal. The interface is easily modified and there is much potential to incorporate interesting and powerful features, such as record selection, linking and web mapping.

This document describes the default configuration of the Portal.

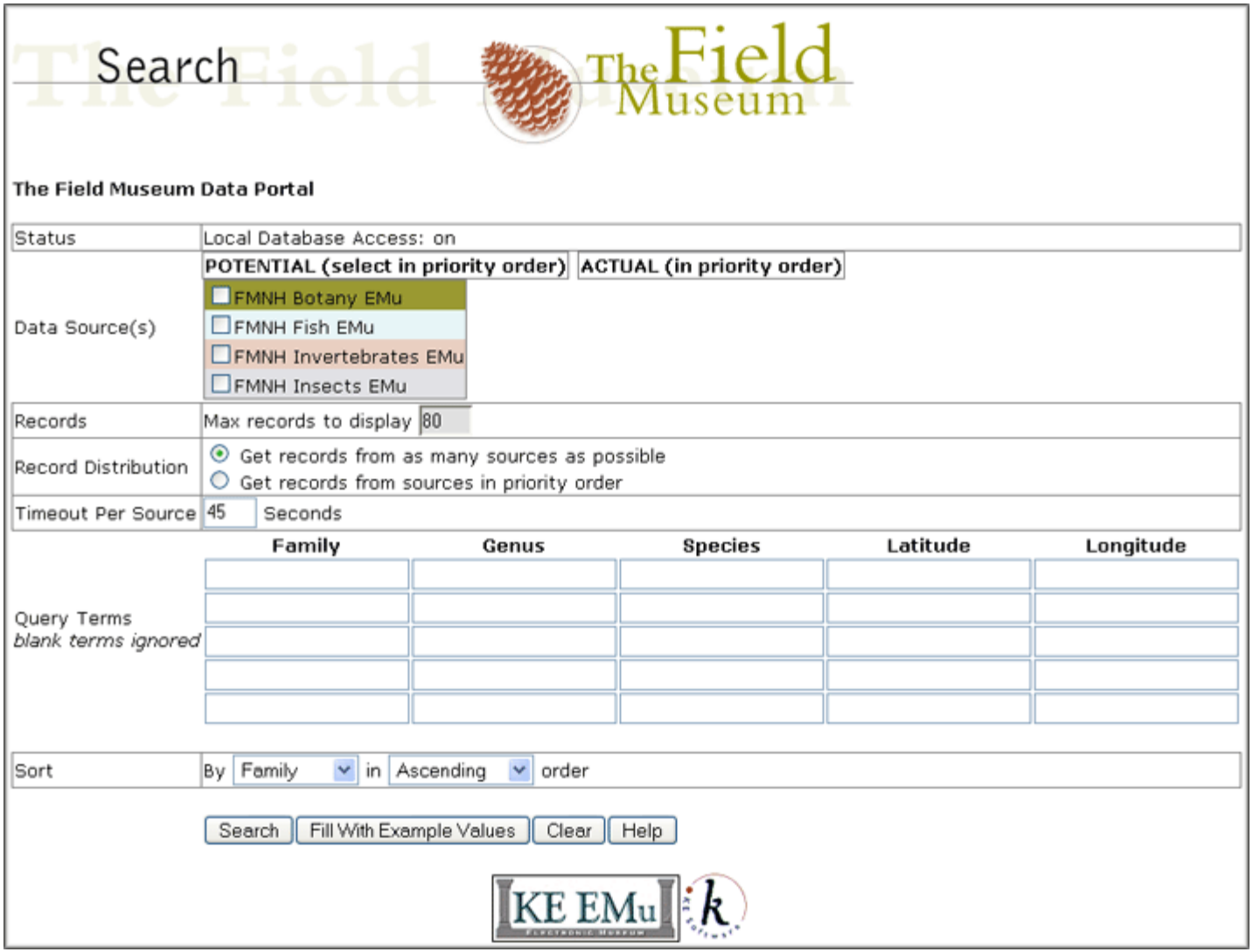
The Search page

The following description applies to the default Portal Search page.

> Keep in mind that is a simple matter to customize the Portal browser to provide alternative functionality, a different interface, or even to dispense with the interface entirely if the Portal is used as part of another system.

On the Search page it is possible to:

- Select any of the specified Data Sources.
- Set the order of importance of each selected Data Source.
- Use a mixture of AND and OR query terms.
- Limit the number of records found.
- Specify how results will be sorted.


Search
The Field Museum
The Field Museum Data Portal
Status
Local Database Access: on
POTENTIAL (select in priority order)
ACTUAL (in priority order)
Data Source(s)
FMNH Botany EMu
FMNH Fish EMu
FMNH Invertebrates EMu
FMNH Insects EMu
Records
Max records to display 80
Record Distribution
Get records from as many sources as possible
Get records from sources in priority order
Timeout Per Source
45
Seconds
Family
Genus
Species
Latitude
Longitude
Query Terms
blank terms ignored
Sort
By Family in Ascending order
Search
Fill With Example Values
Clear
Help
KE EMu

The following table describes each component of the Search page:

Control	Description
Status	Indicates the status of the EMuWeb services on the EMu database server. If EMuWeb is not running, the system will not accept queries.
Data Sources	Each searchable Data Source is listed here. Users select which Source(s) to search. The sequence in which Sources are selected determines the order in which results are displayed; this may be important depending on the number of records returned by the search (see **Records** and **Record Distribution** below).
Records	Specifies the maximum number of records to be returned by the search.
Record Distribution	These options work in conjunction with **Records** and **Data Sources**: • **Get Records From As Many Sources As Possible** The search will run against each Data Source selected by the user and will return records equally (as far as possible) from each Source up to the **Max Records To Display**. • **Get Records From Sources In Priority Order** The search will run against the first Data Source that the user selected and will return as many records as possible; if this is less than the **Max Records To Display**, the second Data Source will be searched, and so on, up to the **Max Records To Display**.
Timeout Per Source	Specify how long (in seconds) to wait for a response from each Data Source. Searches of each Source are run simultaneously. Results will be displayed when all Sources have responded or when the timeout value has been reached.
Query Terms	Specify the terms for which to search: • Entering values in a single row specifies a Boolean AND search (all values in that row must be found). • Each row is a Boolean OR search. For example: 1. In the first row, values are entered in Family and Genus. 2. In the second row a value is entered in Species. When the search is run, records that contain both values in the first row, or records that contain the value in the second row will be returned.

Sort	Specify a field on which to sort results, and whether to sort in ascending or descending order. The field and order specified here can be changed on the Results List page.	
Buttons	**Search**	Commence the search.
	Fill With Example Values	Enter some typical search values appropriate to the Data Sources selected.
	Clear	Clear any search terms specified.
	Help	Display user help.

Example Search

In this example we search for records with:

- A Family value of *Solanaceae* AND a Genus of *Solanum*
- OR with a Genus of *Cestrum*

1. Select the Data Sources that you wish to search.

   The order in which the Data Sources are selected determines the priority in which they are searched. In other words, if there are four Data Sources listed and you want the last one in the list to have priority in the search, select it first.

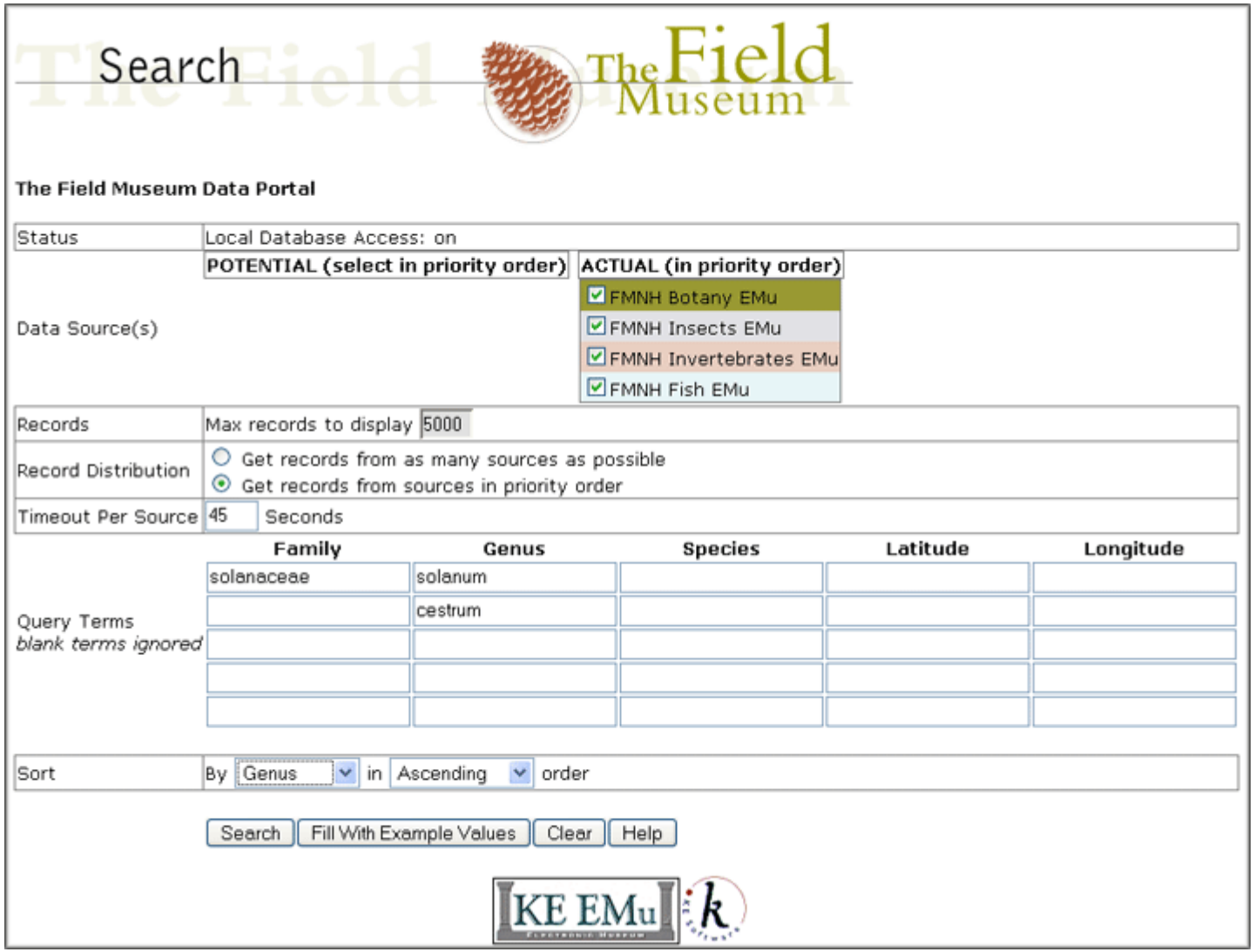
   In this example we select the **FMNH Botany EMu** checkbox (and just to demonstrate the priority ordering of Data Sources, we then select **FMNH Insects EMu**, **FMNH Invertebrates EMu** and **FMNH Fish EMu**).
2. Specify the maximum number of records to display.

   The default is 80. In this case we enter `5000`.
3. At Record Distribution, select (or accept if it is the default setting) **Get records from sources in priority order**.
4. Specify a Timeout Per Source.

   The default is 45 seconds and in this case we won't change that.
5. In the first row of the Query Terms table, enter `Solanaceae` in the Family cell AND *Solanum* in the Genus cell.

   In the second row, enter `Cestrum` in the Genus cell.
6. Select **Genus** in the Sort By drop list.

   The results will be sorted in alphabetical order by Genus.


Search
The Field Museum
The Field Museum Data Portal
Status
Local Database Access: on
POTENTIAL (select in priority order)
ACTUAL (in priority order)
Data Source(s)
FMNH Botany EMu
FMNH Insects EMu
FMNH Invertebrates EMu
FMNH Fish EMu
Records
Max records to display 5000
Record Distribution
Get records from as many sources as possible
Get records from sources in priority order
Timeout Per Source
45
Seconds
Family
Genus
Species
Latitude
Longitude
Query Terms
blank terms ignored
solanaceae
solanum
cestrum
Sort
By Genus in Ascending order
Search
Fill With Example Values
Clear
Help
KE EMu

7. Select the **Search** button.

   The Results List page displays.

   Each of the selected Data Sources will be searched simultaneously up to the maximum timeout (45 seconds). The display of records is determined by:

   - The priority order of the Data Sources (**FMNH Botany EMu** has priority over **FMNH Insects EMu** for instance)
   - The Record Distribution option and maximum records to display setting.

   In this case the Search results will be listed first from **FMNH Botany EMu** up to 5000 records. If less than 5000 matching records are found in the **FMNH Botany EMu** Data Source, matching records from the next Data Source will be listed, and so on until all matches are returned up to a maximum of 5000.

   In this search, records that contain both `Solanaceae` AND `Solanum` (the record must contain both words, not just one of them) `OR` which contain `Cestrum` will be located.

The Results List page

Search

The Field Museum

The Field Museum Data Portal Results List

Search Again

Source	Records	Status
FMNH Botany EMu	3570	completed
FMNH Insects EMu	0	completed
FMNH Invertebrates EMu	0	completed
FMNH Fish EMu	0	completed

Set of up to 5000 matching records sampling from sources in priority order , sorted in ascending order by Genus

Source	Description	Scientific Name	Record Source	Class	Family	Genus	Species	Type Status	Latitude	Longitude	Irn	Summary
FMNH Botany EMu	Cestrum tomentosum L. f., Peru, A. SagÃ¡istegui A. 15398, NY	Cestrum tomentosum L. f.	FMNH Botany EMu		Solanaceae	Cestrum	tomentosum				191004	Cestrum tomentosum L. f., Peru, A. SagÃ¡istegui A.
FMNH Botany EMu	Cestrum tomentosum L. f., Peru, A. SagÃ¡istegui A. 15398, BM	Cestrum tomentosum L. f.	FMNH Botany EMu		Solanaceae	Cestrum	tomentosum				191007	Cestrum tomentosum L. f., Peru, A. SagÃ¡istegui A.
FMNH Botany EMu	Cestrum tomentosum L. f., Peru, A. SagÃ¡istegui A. 15398, HAO	Cestrum tomentosum L. f.	FMNH Botany EMu		Solanaceae	Cestrum	tomentosum				191005	Cestrum tomentosum L. f., Peru, A. SagÃ¡istegui A.
FMNH Botany EMu	Cestrum tomentosum L. f., Peru, A. SagÃ¡istegui A. 15398, MO	Cestrum tomentosum L. f.	FMNH Botany EMu		Solanaceae	Cestrum	tomentosum				191003	Cestrum tomentosum L. f., Peru, A. SagÃ¡istegui A.
FMNH Botany EMu	Cestrum willdenowii Steud., Type [status unknown], B	Cestrum willdenowii Steud.	FMNH Botany EMu		Solanaceae	Cestrum	willdenowii				246693	Cestrum willdenowii Steud., Type [status unknown]
FMNH Botany EMu	Cestrum glomeratum Schott, BRAZIL, A. C. V. Schott 4980, Type [status unknown], W	Cestrum glomeratum Schott	FMNH Botany EMu		Solanaceae	Cestrum	glomeratum				246576	Cestrum glomeratum Schott, BRAZIL, A. C. V. Scho
FMNH Botany EMu	Cestrum tomentosum L. f., F. W. H. A. von Humboldt, Type [status unknown], B	Cestrum tomentosum L. f.	FMNH Botany EMu		Solanaceae	Cestrum	tomentosum				246681	Cestrum tomentosum L. f., F. W. H. A. von Humbol
FMNH Botany EMu	Cestrum tenussimum Francey, BOLIVIA, O. Buchtien 32, Type [status unknown], G	Cestrum tenussimum Francey	FMNH Botany EMu		Solanaceae	Cestrum	tenussimum				246679	Cestrum tenussimum Francey, BOLIVIA, O. Buchtie
FMNH Botany EMu	Cestrum undulatum RuÃ¿z & Pav., PERU, H. RuÃ¿z L., Type [status unknown], B	Cestrum undulatum RuÃ¿z & Pav.	FMNH Botany EMu		Solanaceae	Cestrum	undulatum				246683	Cestrum undulatum RuÃ¿z & Pav., PERU, H. Ru
FMNH Botany EMu	Cestrum longiflorum RuÃ¿z & Pav., PERU, H. RuÃ¿z L., Type [status unknown], B	Cestrum longiflorum RuÃ¿z & Pav.	FMNH Botany EMu		Solanaceae	Cestrum	longiflorum				246602	Cestrum longiflorum RuÃ¿z & Pav., PERU, H. Ru
FMNH Botany EMu	Cestrum lucidum Francey, COLOMBIA, L. J. Schlim 460, Type [status unknown], G	Cestrum lucidum Francey	FMNH Botany EMu		Solanaceae	Cestrum	lucidum				246604	Cestrum lucidum Francey, COLOMBIA, L. J. Schlim
FMNH Botany EMu	Cestrum lundianum Dun., BRAZIL, Lund, Type [status unknown], G-DC	Cestrum lundianum Dun.	FMNH Botany EMu		Solanaceae	Cestrum	lundianum				246605	Cestrum lundianum Dun., BRAZIL, Lund, Type [stat
FMNH Botany EMu	Cestrum luridum Dun., BRAZIL, Lund, Type [status unknown], G-DC	Cestrum luridum Dun.	FMNH Botany EMu		Solanaceae	Cestrum	luridum				246606	Cestrum luridum Dun., BRAZIL, Lund, Type [status
FMNH Botany EMu	Cestrum microcalyx Francey, COLOMBIA, J. J. Triana, Type [status unknown], G	Cestrum microcalyx Francey	FMNH Botany EMu		Solanaceae	Cestrum	microcalyx				246614	Cestrum microcalyx Francey, COLOMBIA, J. J. Trian
FMNH Botany EMu	Cestrum microphyllum Linden, COLOMBIA, J. J. Linden 722, Type [status unknown], G	Cestrum microphyllum Linden	FMNH Botany EMu		Solanaceae	Cestrum	microphyllum				246616	Cestrum microphyllum Linden, COLOMBIA, J. J. Lind
FMNH Botany EMu	Cestrum microphyllum Linden, COLOMBIA, J. J. Linden 722, Type [status unknown], G-DC	Cestrum microphyllum Linden	FMNH Botany EMu		Solanaceae	Cestrum	microphyllum				246615	Cestrum microphyllum Linden, COLOMBIA, J. J. Lind
FMNH Botany EMu	Cestrum moritzii Dun., COLOMBIA, J. W. K. Moritz 309, Type [status unknown], B	Cestrum moritzii Dun.	FMNH Botany EMu		Solanaceae	Cestrum	moritzii				246621	Cestrum moritzii Dun., COLOMBIA, J. W. K. Moritz 3
FMNH Botany EMu	Cestrum nemanthum Dun., BRAZIL, P. C. D. Clausen [= P. Claussen], Type [status unknown], G-DC	Cestrum nemanthum Dun.	FMNH Botany EMu		Solanaceae	Cestrum	nemanthum				246623	Cestrum nemanthum Dun., BRAZIL, P. C. D. Clauser
FMNH Botany EMu	Cestrum ochraceum Francey, COLOMBIA, F. C. Lehmann 900, Type [status unknown], G	Cestrum ochraceum Francey	FMNH Botany EMu		Solanaceae	Cestrum	ochraceum				246626	Cestrum ochraceum Francey, COLOMBIA, F. C. Leh
FMNH Botany EMu	Cestrum ochraceum var. macrophyllum Francey, ECUADOR, R. Spruce 5082, Type [status unknown], G	Cestrum ochraceum var. macrophyllum Francey	FMNH Botany EMu		Solanaceae	Cestrum	ochraceum				246627	Cestrum ochraceum var. macrophyllum Francey, EC
FMNH Botany EMu	Cestrum oliganthum Dun., FRENCH GUIANA, F. M. R. Leprieur 250, Type [status unknown], G-DC	Cestrum oliganthum Dun.	FMNH Botany EMu		Solanaceae	Cestrum	oliganthum				246628	Cestrum oliganthum Dun., FRENCH GUIANA, F. M. R
FMNH Botany EMu	Cestrum paniculatum Kunth, VENEZUELA, F. W. H. A. von Humboldt, Type [status unknown], B	Cestrum paniculatum Kunth	FMNH Botany EMu		Solanaceae	Cestrum	paniculatum				246631	Cestrum paniculatum Kunth, VENEZUELA, F. W. H.
FMNH Botany EMu	Cestrum parviflorum Dun., ECUADOR, K. T. Hartweg 1308, Type [status unknown], B	Cestrum parviflorum Dun.	FMNH Botany EMu		Solanaceae	Cestrum	parviflorum				246632	Cestrum parviflorum Dun., ECUADOR, K. T. Hartweg

The Results List page displays:

1. A summary of the Data Sources searched and a count of the records returned:

Search Again

Source	Records	Status
FMNH Botany EMu	3570	completed
FMNH Insects EMu	0	completed
FMNH Invertebrates EMu	0	completed
FMNH Fish EMu	0	completed

2. A table listing the returned records. The columns that display are specified in the XML and can easily be configured to suit an institution's requirements.

Click a column heading to change the sort order (ascending / descending) and the column on which the results are sorted.

Select the **Search Again** link above the Summary table to return to the Search page.

SECTION 2

Administration of the Portal

Caching of Data

In order to reduce the load on the Data Sources, search results are cached for up to 15 minutes from the time that the data was last used. If the Data Source changes within the cache time-frame, results will not immediately reflect the Data Source changes.

It is possible to forcibly clear the cache from a browser by using the url:

```
http://remus.yvr.kesoftware.com/emuwebfmnh/webservices/
lib/DataCacher.php?action=cleanCache
```

This part of the url:

```
http://remus.yvr.kesoftware.com/emuwebfmnh/
```

is institution specific.

Note that this will clear the cache for all users.

Customization

In the following examples the Portal client is FMNH and the fetcher is NMNH DiGIR.

First we need to locate and edit the fetcher:

1. Locate the NMNH DiGIR fetcher - this is located in the Portal's fetcher directory, e.g.:
   `cd ~/web/webservices/portal/fmnh/fetchers`
2. An `ls` of this directory might return:
   ```
   DefaultTexxml.php
   FmnhBotTexxml.php
   FmnhFishesTexxml.php
   FmnhInsectTexxml.php
   FmnhIzTexxml.php
   NmnhDigir.php
   ```
3. Edit the `NmnhDigir.php` fetcher:
   `vi NmnhDigir.php`

How to disable/enable an existing Data Source

Data Sources can be disabled/enabled temporarily on the back-end.

To enable or disable a Data Source that has already been specified, locate its fetcher in the Portal's fetcher directory and change the `enabled` flag to `true` or `false`. In this case we enable the NMNH DiGIR fetcher:

1. Locate the line that reads:
   `var  $enabled = false;`
   and change it to:
   `var  $enabled = true;`
2. Save the file.
   The NMNH source will be added to the list of Data Sources on the Search page.

How to change the display name of a Data Source

1. Locate and edit the following line:
   `var  $sourceName = "Name to change";`

How to change the Data Source color

1. Locate and edit a line similar to:
   `var  $preferredRGB = '#ffaaaa';`

How to change the fields returned by a search, set example values, map field names

1. Locate lines similar to:
   `$this->setKnownConcept("Family","DarFamily");`

```
$this->setKnownConcept("Genus","DarGenus","Acacia");
```

Each line that calls `setKnownConcept`:

- Adds a field.
- Specifies how to extract it from the Data Source's native list of fields.
- Specifies an example value (if any) for test queries.

The format of these lines is:

```
setKnownConcept( "Common Field Name", "Source Field", "Example
(if any)");
```

where:

`"Common Field Name"` is what the Portal will call the field.

`"Source Field"` is what the Data Source calls the field.

`"Example"` is an optional value for specifying a suggested value to run in test queries.

> The Portal looks at all the `"Common Field Names"` of all enabled fetchers, and those that exist in all fetchers will be made available as search fields.

How to add a new Data Source

This is achieved by writing a fetcher for the Data Source and placing it in the Portal's fetcher directory. KE Software supplies components for quickly setting up fetchers for EMu, DiGIR and OAI sources. It also supplies lower level components for building fetchers for other web services; assembling these can be done either in-house or by KE Software.

For example - to add a Texxml data source to an EMu database:

1. Find the host name of the database (e.g. the server host might be "`hal2001.kesoftware.com`").
2. Find the host's texxml port to which we will connect (e.g. 30003).
3. Establish a set of fields that can be used as searchable concepts, (e.g. `Family`, `Genus`, `Species`).
4. Map these concepts to the EMu database, e.g.:
   ```
   Family <=> DarFamily
   Genus <=> DarGenus
   Species <=> DarSpecies
   ```

It is probably easier to copy an existing Texxml fetcher and use this as the basis for a new one:

1. `cd ~/web/webservices/portal/fmnh/fetchers`
2. `cp DefaultTexxml.php MyShinyNewTexxml.php`
3. Edit `MyShinyNewTexxml.php` using the details located above:
   ```
   var   $enabled = true;
   var   $hostname = "hal2001.kesoftware.com";
   $this->port = 30003;
   $this->setKnownConcept("Family","DarFamily");
   ```

```
$this->setKnownConcept("Genus","DarGenus","Acacia");
$this->setKnownConcept("Species","DarSpecies");
```

How to change the look and feel

KE Software provides a basic web browser interface for the Portal. More advanced functionality can be added though a combination of XSL, CSS and Javascript (or other web scripting tools).

The Portal returns XML in response to requests, and institutions can process this XML to generate the user interfaces they require.

Typically the default XSL stylesheets, CSS stylesheets (and any javascript) reside in:

`~/web/webservices/portal/style`

To customize any of these, place your files in:

`~/web/webservices/portal/CLIENT/style`

where:

`CLIENT` is your Portal name (e.g. fmnh, mnh, nmnh, mv, etc.).

To change how the query screen is generated from the Portal XML response, typically you would create a customized:

`~/web/webservices/portal/CLIENT/style/portal_queryscreen.xsl`

To change how the Results List page is created you would create a customized:

`~/web/webservices/portal/CLIENT/style/portal.xsl`

It is possible to configure the Portal to use a stylesheet of a different name for Results Lists by editing the `PortalFactory` file in:

`~/web/webservices/portal/CLIENT/PortalFactory.php`

and adding a line to the local Portal object, e.g.:

```
$defaultStylesheet = 'otherPortal.xsl';
```

It is also possible to use a different stylesheet by calling it with its name as a parameter. For example, for a Search page use:

```
http://HOST/emuwebCLIENT/webservices/portal.php?queryScreen=url_to
_stylesheet
```

To display a Results page with an alternative stylesheet, pass the stylesheet as an argument to the Portal when making the search request.

XML responses

The Search page XML

This provides information about how the Portal can be queried and lists Data Sources and fields that can be queried. For example:


```
<xml>
  <queryScreen destinationUrl='/emuwebfmnh/webservices/portal.php'
  name='The Field Museum Data Portal' statusMapAvailable=''
  backendType='fmnh' localDbAccess='on'>
    <sources>
      <source name='FmnhBotTexxml' displayName='FMNH Botany EMu'
      suggestedPriority='0' foregroundRGB='#000000'
      backgroundRGB='#999933' icon='' />
      <source name='FmnhFishesTexxml' displayName='FMNH Fish EMu'
      suggestedPriority='1' foregroundRGB='#000000'
      backgroundRGB='#E7F5F6' icon='' />
      <source name='FmnhIzTexxml'
      displayName='FMNH Invertebrates EMu' suggestedPriority='2'
      foregroundRGB='#000000' backgroundRGB='#e8cec1' icon='' />
      <source name='FmnhInsectTexxml'
      displayName='FMNH Insects EMu' suggestedPriority='3'
      foregroundRGB='#000000' backgroundRGB='#e1e1e5' icon='' />
    </sources>
    <queryableFields>
      <field name='Family:string' displayName='Family'
      type='string'>
        <example src='FmnhBotTexxml' />
        <example src='FmnhFishesTexxml' />
        <example src='FmnhIzTexxml'>Muricidae</example>
        <example src='FmnhInsectTexxml' />
      </field>
      <field name='Genus:string' displayName='Genus' type='string'>
        <example src='FmnhBotTexxml'>Acacia</example>
        <example src='FmnhFishesTexxml' />
        <example src='FmnhIzTexxml' />
        <example src='FmnhInsectTexxml' />
      </field>
      <field name='Species:string' displayName='Species' type='string'>
        <example src='FmnhBotTexxml' />
        <example src='FmnhFishesTexxml'>gracilis</example>
        <example src='FmnhIzTexxml' />
        <example src='FmnhInsectTexxml'>cariosa</example>
      </field>
      <field name='Latitude:float' displayName='Latitude'
      type='float'>
        <example src='FmnhBotTexxml' />
        <example src='FmnhFishesTexxml' />
        <example src='FmnhIzTexxml' />
        <example src='FmnhInsectTexxml' />
      </field>
      <field name='Longitude:float' displayName='Longitude'
      type='float'>
        <example src='FmnhBotTexxml' />
        <example src='FmnhFishesTexxml' />
        <example src='FmnhIzTexxml' />
        <example src='FmnhInsectTexxml' />
```

```
      </field>
    </queryableFields>
    <suggestedParameters>
      <maxPerSource>20</maxPerSource>
      <timeoutSeconds>45</timeoutSeconds>

<displayStylesheet>/emuwebfmnh/webservices/portal/fmnh/style/portal.xsl
      </displayStylesheet>

<queryStylesheet>/emuwebfmnh/webservices/portal/fmnh/style/portal_queryscre
en.xsl
      </queryStylesheet>
    </suggestedParameters>
  </queryScreen>
</xml>
```

Results List XML

This is returned in response to a query. It has some general information on the sources and their responses, a list of fields provided by the sources and a list of matching records. Some typical XML would be:


```
<xml>
  <mergedData>
    <statusBlock status='success'>
      <instance>Portal.8145.1196378088</instance>
      <systemName>The Field Museum Data Portal</systemName>
      <emuwebBase>emuwebfmnh</emuwebBase>
      <emuBackendType>fmnh</emuBackendType>
      <description>Set of up to 10 matching records sampling across
      sources</description>
      <sources>
        <source name='FmnhFishesTexxml' status='completed'
        sourceOrder='3' displayName='FMNH Fish EMu'
        recordsUsed='10' translatorType='texxml'
        backgroundRGB='#E7F5F6' foregroundRGB='#000000' icon='' />
      </sources>
      <groups>
        <group type='base'>description</group>
        <group type='extended'>ScientificName</group>
        <group type='extended'>recordSource</group>
        <group type='extended'>Class</group>
        <group type='extended'>Family</group>
        <group type='extended'>Genus</group>
        <group type='extended'>Species</group>
        <group type='extended'>TypeStatus</group>
        <group type='extended'>Latitude</group>
        <group type='extended'>Longitude</group>
        <group type='extended'>irn</group>
        <group type='extended'>Summary</group>
      </groups>
    </statusBlock>
    <records start='1' limit='10' count='10' sortBy='Family'
    sortOrder='ascending'>
      <record index='1' sourceName='FMNH Fish EMu'
      backgroundRGB='#E7F5F6' foregroundRGB='#000000' icon=''>
        <description>50644:Hyphessobrycon
        gracilis:54::::Characidae:226:KPS1926-36:South
        America:Argentina</description>
        <latitude>
        </latitude>
        <longitude>
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