

How to Configure Topcat

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Learning Outcomes

- Understand why the configuration is the way it is
- Configure a minimal viable Topcat
 - Then build upon it
- I'm not going to show every little detail
 - Just enough to show you how to help yourself
- Brief look plugins
 - A new feature!
 - There to keep the core uncluttered – i.e. not trying to do everything.

Terminology and Preparation Work

- “Entity” / “Entities” relate to Icat entities
 - <https://repo.icatproject.org/site/icat/server/4.8.0/schema.html>
 - You need to understand this before going any further

Tips & Tricks

- **Use an editor with code folding**
- Copy other facilities
 - Look at their “topcat.json”s
 - <https://icat.diamond.ac.uk>
 - <https://data.isis.stfc.ac.uk>
 - View the network traffic (in Firefox/Chrome)
 - F12 – Windows/Linux
 - Cmd + alt + I – Mac
 - Refresh browser then select topcat.json and “preview”.


Tips & Tricks

```
1 ▼ {
2 ▼   "site": {
3     "topcatUrl": "https://localhost:8181",
4     "home" : "my-data",
5     "enableEuCookieLaw" : true,
6     "paging" : { ...
18   },
19   "breadcrumb": {
20     "maxTitleLength": 30
21   },
22   "search": { ...
94   },
95   "browse": { ...
126   },
127   "cart": { ...
147   },
148   "myDownloads": { ...
165   },
166   "pages" : [ ...
209
210   ]
211 },
212 "facilities": [ ...
1237 ]
1238 }
```

Tips & Tricks

- Use an editor with code folding
- **Copy other facilities**
 - Look at their “topcat.json”s
 - <https://icat.diamond.ac.uk>
 - <https://data.isis.stfc.ac.uk>
 - View the network traffic (in Firefox/Chrome)
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Tips & Tricks

Home About Contact HelpLogin

Login

Authentication Type

Username/Password

Username

<https://icat.diamond.ac.uk/#/>

InspectorConsoleDebuggerStyle EditorPerformanceNetwork

AllHTMLCSSJSXHRFontsImagesMediaFlashWSOther

11 requests, 1,221.76 kB, 2.96 sFilter URLs

Status	Method	File	Headers	Cookies	Params	Response	Timings	Security
200	GET	/	Filter properties					
200	GET	vendor.f61b6d97.css	JSON					
200	GET	main.4dd29b17.css	site: Object					
200	GET	topcat.css	home: "my-data"					
200	GET	vendor.8f756533.js	enableEuCookieLaw: true					
200	GET	scripts.60d130ad.js	paging: Object					
200	GET	topcat.json	breadcrumb: Object					
200	GET	lang.json	serviceStatus: Object					
200	GET	diamond_logo.png	maintenanceMode: Object					
200	GET	ping	search: Object					
200	GET	login.html	browse: Object					
	GET		cart: Object					
	GET		myDownloads: Object					
	GET		pages: Array					
	GET		facilities: Object					
	GET		dls: Object					

Tips & Tricks

▼ JSON

▼ site: Object

home: "my-data"

enableEuCookieLaw: true

▶ paging: Object

▶ breadcrumb: Object

▶ serviceStatus: Object

▶ maintenanceMode: Object

▶ search: Object

▶ browse: Object

▶ cart: Object

▶ myDownloads: Object

▶ pages: Array

▼ facilities: Object

▶ dls: Object

History – Why the configuration is the way it is

- Heavily influenced by UI Grid
- Has to support multiple facilities
- Had to deal with a constant flow of new requirements
 - A JSON file makes this cheap and easy

The High-level Structure

- “site” - anything global (i.e. no facility specific)
- “facilities” - anything facility specific

The High-level Structure

```
1 ▼ {  
2 ► "site": { ... }  
219 },  
220 ► "facilities": [ ... ]  
1245 ]  
1246 }
```

“site” – The global configuration options

- **"home"**
- **"enableEuCookieLaw"**
- "paging"
- **"breadcrumb"**
- "search"
- "browse"
- "cart"
- "myDownloads"
- "pages"

“site” – The global configuration options

```
1 ▼ {
2 ▼   "site": {
3     "topcatUrl": "https://localhost:8181",
4     "home" : "my-data",
5     "enableEuCookieLaw" : true,
6     "paging" : { ...
18   },
19   "breadcrumb": {
20     "maxTitleLength": 30
21   },
22   "search": { ...
94   },
95   "browse": { ...
126   },
127   "cart": { ...
147   },
148   "myDownloads": { ...
165   },
166   "pages" : [ ...
209
210   ]
211 },
212 "facilities": [ ...
1237 ]
1238 }
```

“site” – The global configuration options

- "home"
- "enableEuCookieLaw"
- **"paging"**
- "breadcrumb"
- "search"
- "browse"
- "cart"
- "myDownloads"
- "pages"

“site” – The global configuration options

```
1 {  
2   "site": {  
3     "topcatUrl": "https://localhost:8181",  
4     "home" : "my-data",  
5     "enableEuCookieLaw" : true,  
6     "paging" : {  
7       "pagingType": "scroll",  
8       "paginationNumberOfRows": 10,  
9       "paginationPageSizes": [  
10        10,  
11        25,  
12        50,  
13        100,  
14        1000  
15      ],  
16      "scrollPageSize": 50,  
17      "scrollRowFromEnd": 10  
18    },  
19    "breadcrumb": {  
20      "maxTitleLength": 30  
21    },  
22    "search": { ...  
94  },  
95    "browse": { ...  
126  },  
127    "cart": { ...  
147  },  
148    "myDownloads": { ...  
165  },  
166    "pages" : [ ...  
209  ],  
210  ],  
211  },  
212  "facilities": [ ...  
1237  ],  
1238 }
```

“site” – The global configuration options

- "home"
- "enableEuCookieLaw"
- "paging"
- "breadcrumb"
- **"search"**
- **"browse"**
- **"cart"**
- **"myDownloads"**
- "pages"

“site” – The global configuration options

```
1 ▼ {
2 ▼   "site": {
3     "topcatUrl": "https://localhost:8181",
4     "home" : "my-data",
5     "enableEuCookieLaw" : true,
6 ►   "paging" : { ...
18   },
19   "breadcrumb": {
20     "maxTitleLength": 30
21   },
22 ►   "search": { ...
94   },
95 ▼   "browse":{
96 ►     "gridOptions": { ...
106   },
107 ►     "metaTabs": [ ...
125   ]
126   },
127 ►   "cart":{ ...
147   },
148 ►   "myDownloads":{ ...
165   },
166 ►   "pages" : [ ...
209   ]
210   },
211   },
212 ►   "facilities": [ ...
1237   ]
1238 }
```

“site” – The global configuration options

- "home"
- "enableEuCookieLaw"
- "paging"
- "breadcrumb"
- "search"
- "browse"
- "cart"
- "myDownloads"
- **"pages"**

“site” – The global configuration options

```

3  "myDownloads":{
4      "gridOptions": { ... }
5  },
6  "pages" : [
7      {
8          "url" : "/about",
9          "stateName": "about",
10         "addToNavBar": {
11             "linkLabel" : "MAIN_NAVIGATION.ABOUT",
12             "align" : "left"
13         }
14     },
15     { ... }
16     },
17     { ... }
18     },
19     { ... }
20     },
21     { ... }
22     },
23     { ... }
24     },
25     { ... }
26     },
27     { ... }
28     },
29     { ... }
30     },
31     { ... }
32     },
33     { ... }
34     },
35     { ... }
36     },
37     { ... }
38     },
39     { ... }
40     },
41     { ... }
42     },
43     { ... }
44     },
45     { ... }
46     },
47     { ... }
48     },
49     { ... }
50     },
51     { ... }
52     },
53     { ... }
54     },
55     { ... }
56     },
57     { ... }
58     },
59     { ... }
60     },
61     { ... }
62     },
63     { ... }
64     },
65     { ... }
66     },
67     { ... }
68     },
69     { ... }
70     },
71     { ... }
72     },
73     { ... }
74     },
75     { ... }
76     },
77     { ... }
78     },
79     { ... }
80     },
81     { ... }
82     },
83     { ... }
84     },
85     { ... }
86     },
87     { ... }
88     },
89     { ... }
90     },
91     { ... }
92     },
93     { ... }
94     },
95     { ... }
96     },
97     { ... }
98     },
99     { ... }
100    ],
101    "facilities": [ ... ]
102 }

```

“facilities” – The facility specific options

- **"name"**
- **"title"**
- **"idsUrl"**
- "hierarchy"
- "authenticationTypes"
- "downloadTransportTypes"
- "admin"
- "myData"
- "browse"

“facilities” – The facility specific options

- "name"
- "title"
- "idsUrl"
- **"hierarchy"**
- "authenticationTypes"
- "downloadTransportTypes"
- "admin"
- "myData"
- "browse"


hierarchy

```
"hierarchy": [  
    "facility",  
    "proposal",  
    "investigation",  
    "dataset",  
    "datafile"  
]
```

hierarchy

```
"hierarchy": [  
    "facility",  
    "instrument",  
    "facilityCycle",  
    "investigation",  
    "dataset",  
    "datafile"  
]
```

hierarchy

<div> Science & Technology Facilities Council</div> <div>HomeAboutContactHelpAdmin</div> <div>Login</div>					
<div>My DataBrowseSearch</div>					
<div>Lorum Ipsum Light / Proposal 1 / Proposal 1-Proposal 1 - 4 / Dataset 1 / Datafile</div>					Results: 100
	<div>Name</div> <div>Containing...</div>	<div>Location</div> <div>Containing...</div>	<div>File Size</div> <div></div>	<div>Modified Time</div> <div>From...<div></div>To...<div></div></div>	<div>Actions</div>
✓	Datafile 1	quia/facere/ut	508.84 kB	2016-10-20 07:20:38	<div>Download</div>
✓	Datafile 10	recusandae/architecto/exercitation...	169.38 kB	2016-10-20 07:20:38	<div>Download</div>
✓	Datafile 100	quia/beatae/ut	715.24 kB	2016-10-20 07:20:39	<div>Download</div>
✓	Datafile 11	doloribus/quia/et	310.06 kB	2016-10-20 07:20:38	<div>Download</div>
✓	Datafile 12	ut/asperiores/ut	217.79 kB	2016-10-20 07:20:38	<div>Download</div>
✓	Datafile 13	sed/in/est	464.63 kB	2016-10-20 07:20:38	<div>Download</div>
✓	Datafile 14	quod/fugiat/vitae	718.29 kB	2016-10-20 07:20:38	<div>Download</div>
✓	Datafile 15	quod/deleniti/quae	497.99 kB	2016-10-20 07:20:38	<div>Download</div>
✓	Datafile 16	assumenda/perspiciatis/asperiores	343.32 kB	2016-10-20 07:20:38	<div>Download</div>

hierarchy



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My Data

Browse

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“facilities” – The facility specific options

- "name"
- "title"
- "idsUrl"
- "hierarchy"
- **"authenticationTypes"**
- "downloadTransportTypes"
- "admin"
- "myData"
- "browse"

authenticationTypes

```
"authenticationTypes": [  
  {  
    "title": "Username/Password",  
    "plugin": "ldap"  
  },  
  {  
    "title": "Anonymous",  
    "plugin": "anon"  
  }  
]
```

“facilities” – The facility specific options

Login

Facility

DIAMOND ▼

Authentication Type

Username/Password ▼

✓ Username/Password
Anonymous

Username

Password

....

Login


“facilities” – The facility specific options

- "name"
- "title"
- "idsUrl"
- "hierarchy"
- "authenticationTypes"
- **"downloadTransportTypes"**
- "admin"
- "myData"
- "browse"

downloadTransportTypes


```
"downloadTransportTypes": [  
  {  
    "type": "https",  
    "idsUrl": "https://fdsgos11.fds.rl.ac.uk"  
  },  
  {  
    "type": "globus",  
    "idsUrl": "https://fdsgos11.fds.rl.ac.uk"  
  }  
]
```

downloadTransportTypes



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Download

Download Name	Access Method	Size	Estimated download time - 30 Mbps connection ▾	Facility	Availability
LILS_2016-10-20_08-06-56	<div>https ▾<div>✓ https globus</div></div>	2.39 MB	1 second	LILS	Available


OK

Cancel

Reoccurring constructs

- “gridOptions” - used to configure the relative grid
- “metaTabs” - used to configure the extra information shown after clicking on a row
- Both use convention over configuration i.e. sensible defaults
- These two constructs take up the bulk of the topcat.json

Reoccurring constructs

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My DataBrowseSearch

My Data

Title ▾	Visit Id ▾	Run Number ▾	Beamline ▾	Size ▾	Start Date ▾ ₁	End Date ▾
Containing...	Containing...	From... To...	Containing...		From... 2016-10-20 ×	From... To...
impedit ea aut	Proposal 3 - 2		Instrument 11	152.03 MB	2016-10-19	2016-10-27
facere beatae animi	Proposal 7 - 1		Instrument 7	149.28 MB	2016-10-19	2016-10-27
est voluptatem consequ...	Proposal 14 - 5		Instrument 7	143.39 MB	2016-10-19	2016-10-27
perspiciatis quibusdam ...	Proposal 18 - 5		Instrument 18	151.38 MB	2016-10-19	2016-10-27
ut est qui	Proposal 1 - 2		Instrument 6	157.71 MB	2016-10-19	2016-10-27
sequi asperiores autem	Proposal 6 - 5		Instrument 9	151.97 MB	2016-10-19	2016-10-27
ab molestias ipsum	Proposal 14 - 3		Instrument 9	145.63 MB	2016-10-19	2016-10-27
architecto distinctio est	Proposal 18 - 2		Instrument 15	143.53 MB	2016-10-19	2016-10-27
minus aut est	Proposal 1 - 1		Instrument 2	145.84 MB	2016-10-19	2016-10-27


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Reoccurring constructs



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Results: 20

Name ▾

Containing...

Proposal 1

Proposal 10

Proposal 11

Proposal 12

Proposal 13

Proposal 14

Proposal 15


Proposal 16

Proposal 17


Proposal 18

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Reoccurring constructs


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My DataBrowseSearch



Start Date 

End Date 

☒ Visit





☒ Dataset

☒ Datafile


Search

Search Results


VisitDatasetDatafile

Title ▾	Visit Id ▾	Size ▾	Beamline ▾	Start Date ▾	End Date ▾
Containing...	Containing...		Containing...	From...  To... 	From...  To... 
reprehenderit esse ipsum	Proposal 5 - 2	148.04 MB	Instrument 1	2016-10-19	2016-10-27
ab molestias ipsum	Proposal 14 - 3	145.63 MB	Instrument 9	2016-10-19	2016-10-27

Reoccurring constructs

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Cart

Name	Type	Size	Facility	Availability	Actions
Containing...	Containing...		Containing...	Containing...	
Datafile 13	datafile	464.63 kB	LILS	Available	Remove
Datafile 100	datafile	715.24 kB	LILS	Available	Remove
Datafile 12	datafile	217.79 kB	LILS	Available	Remove
Datafile 11	datafile	310.06 kB	LILS	Available	Remove
Datafile 10	datafile	169.38 kB	LILS	Available	Remove
Datafile 1	datafile	508.84 kB	LILS	Available	Remove

Total size: 2.39 MB

[Remove All](#)[Download Cart](#)[Close](#)

Minimal viable gridOptions

```
“gridOptions”: {  
  “columnDefs”: [  
    {“field”: “title”},  
    {“field”: “visitId”}  
  ]  
}
```

gridOptions with links (to the “Browse” section)

```
“gridOptions”: {  
  “columnDefs”: [  
    {“field”: “title”, “link”: true},  
    {“field”: “visitId”}  
  ]  
}
```

gridOptions referencing other entities

E.g. for an Investigation

```
“gridOptions”: {  
  “columnDefs”: [  
    {“field”: “title”},  
    {“field”: “investigationInstrument.name”},  
    {“field”: “visitId”}  
  ]  
}
```

Where is investigationInstrument referenced?

Topcat's standard jpql variables

- datafile
- datafileParameter
- datafileParameterType
- dataset
- datasetParameter
- datasetParameterType
- ...
 - The rest can be found in the Topcat installation documentation.

Topcat's standard jpql variables why?

- The problem:
 - How can I let people configure Topcat without having to learn JPQL?
 - E.g. At the investigation level how can I filter by Instrument without somehow manually defining these queries?

Topcat's standard jpql variables why?

- The solution
 - Create a graph which captures Icat's entity relationships
 - For each relationship define a variable that reflects this
 - Use this graph to work out the JPQL joins and what to include in the results.

gridOptions referencing other entities with selection

E.g. for a Datafile

```
“gridOptions”: {  
  “columnDefs”: [  
    {“field”: “name”},  
    {  
      “field”: “datafileParameter[entity.type.name == 'run_number'].numericValue”,  
      “title”: “Run Number”  
    }  
  ]  
}
```

gridOptions referencing other entities with links

E.g. for an Investigation

```
"gridOptions": {  
  "columnDefs": [  
    {"field": "title"},  
    {"field": "investigationInstrument.name", "link": "instrument"},  
    {"field": "visitId"}  
  ]  
}
```

How linking works

- If a boolean true value - it will link to the current entity's entity page in the “Browse” section.
- If a string value (specifying a relative entity to the current entity) – it will link to that particular relative entity's entity page within the “Browse” section.

gridOptions - pre-sorting

```
“gridOptions”: {  
  “columnDefs”: [  
    {  
      “field”: “title”,  
      “sort”: {  
        “direction”: “asc”,  
        “priority”: 1  
      },  
    }  
  ]  
}
```

gridOptions – adding a column title to the breadcrumb

```
“gridOptions”: {  
  “columnDefs”: [  
    {“field”: “title”, “breadcrumb”: true},  
    {“field”: “investigationInstrument.name”},  
    {“field”: “visitId”}  
  ]  
}
```


gridOptions – enabling and disabling selection


```
“gridOptions”: {  
    “enableSelection”: true,  
    “columnDefs”: [...]  
}
```

- Applies to:
 - Investigation
 - Dataset
 - Datafile

gridOptions – advanced options (well documented)

```
"gridOptions": {  
  "columnDefs": [  
    {  
      "field": "investigationVisit",  
      "jqqlFilter": "CONCAT(investigation.name, '-', investigation.visitId)",  
      "jqqlSort": "investigation.name, investigation.visitId",  
  
      "cellTemplate": "<div class='ui-grid-cell-contents'>{{row.entity.name}}-{{row.entity.visitId}}</div>",  
  
      "breadcrumb": true,  
      "breadcrumbTemplate": "{{item.entity.name}}-{{item.entity.visitId}}"  
    }  
  ]  
}
```

metaTabs

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My DataBrowseSearch

ISIS / HIFI / cycle_15_4 / Visit

Results: 1

	Title ▴ ▾ Containing...	Visit Id ▾ Containing...	Name ▾ Containing...	Size ▾	Beamline ▾ Containing...	Start Date ▾ ₁ From... To...	End Date ▾ From... To...
✓	Calibration cycle 2015-4	1	1635015	0 B	HIFI	2016-02-16	2016-02-18

Visit DetailsVisit Users

Proposal: 1635015

Title: Calibration cycle 2015-4

Start Date: 2016-02-16

End Date: 2016-02-18

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Minimal viable metaTabs

```
"metaTabs": [  
  {  
    "title": "About",  
    "items": [  
      {  
        "field": "description"  
      }  
    ]  
  }  
]
```

metaTabs referencing other entities

```
"metaTabs": [  
  {  
    "title": "Investigators",  
    "items": [  
      {  
        "label": "Investigator"  
        "field": "investigationUser.name"  
      }  
    ]  
  }  
]
```

metaTabs referencing other entities with selection

```
"metaTabs": [  
  {  
    "title": "About",  
    "items": [  
      {  
        "label": "Run number"  
        "field": "datafileParameter[entity.type.name == 'run_number'].numericValue"  
      }  
    ]  
  }  
]
```

metaTabs referencing other entities with selection (advanced)

```
"metaTabs": [  
  {  
    "title": "About",  
    "items": [  
      {  
        "title": "METATABS.DATAFILE.PARAMETERS",  
        "items": [  
          {  
            "label": "",  
            "field": "datafileParameter[entity.type.valueType=='STRING'].stringValue",  
            "template": "<span class='label'>{{item.entity.type.name}}</span><span class='value'>{{item.value}}</span>"  
          },  
          {  
            "label": "",  
            "field": "datafileParameter[entity.type.valueType=='NUMERIC'].numericValue",  
            "template": "<span class='label'>{{item.entity.type.name}}</span><span class='value'>{{item.value}}</span>"  
          },  
          {  
            "label": "",  
            "field": "datafileParameter[entity.type.valueType=='DATE_AND_TIME'].datetimeValue",  
            "template": "<span class='label'>{{item.entity.type.name}}</span><span class='value'>{{item.value | date:'yyyy-MM-dd'}}</span>"  
          }  
        ]  
      }  
    ]  
  }  
]
```

Plugins

- If you want to do anything extra use plugins
- New feature
 - Documentation coming soon
- It allows you to create very tailored features.
- Will be used by the STFC's DaaaS
 - Implements a “My Machines” tab
- Let's have a look at an example
 - Diamonds DOI minting service
 - Still in development

The future

- Make the configuration point and click.
- However, the point and click interface will logically follow same structure.
- Make the core faster and bug free
 - But use plugins for new features.

Conclusion

- Topcat is very configurable.
 - Well documented in Topcat's installation page.
- If it can't do what you want you can write a plugin!
- If need help you can ask us as many questions as you want
 - Via forum for public questions
 - Via email for private (sensitive) questions
 - `jody.salt@stfc.ac.uk`

Questions?

Thanks for listening
(jody.salt@stfc.ac.uk)