How to Configure Topcat

By Jody Salt
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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

```json
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
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    – View the network traffic (in Firefox/Chrome)

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Tips & Tricks

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

```json
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         },
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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

```json
  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

```json
"myDownloads":{
    "gridOptions": { ... }
    }
},
"pages" : [
    {
        "url" : "/about",
        "stateName": "about",
        "addToNavBar": {
            "linkLabel" : "MAIN_NAVIGATION.ABOUT",
            "align" : "left"
        }

    },
    { ... }

    },
    { ... }
    },
    { ... }
    },
    { ... }
    },
    { ... }
    },
    { ... }
    }

    ]
},
"facilities": [ ... ]
    ]
}
```

"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

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Results: 100

	Name	Location	File Size	Modified Time	Actions
	Containing...	Containing...		From... To...	
✓	Datafile 1	quia/facere/ut	508.84 kB	2016-10-20 07:20:38	Download
✓	Datafile 10	recusandae/architecto/exercitation...	169.38 kB	2016-10-20 07:20:38	Download
✓	Datafile 100	quia/beatae/ut	715.24 kB	2016-10-20 07:20:39	Download
✓	Datafile 11	doloribus/quia/et	310.06 kB	2016-10-20 07:20:38	Download
✓	Datafile 12	ut/asperiores/ut	217.79 kB	2016-10-20 07:20:38	Download
✓	Datafile 13	sed/in/est	464.63 kB	2016-10-20 07:20:38	Download
✓	Datafile 14	quod/fugiat/vitae	718.29 kB	2016-10-20 07:20:38	Download
✓	Datafile 15	quod/deleniti/quae	497.99 kB	2016-10-20 07:20:38	Download
✓	Datafile 16	assumenda/perspiciatis/asperiores	343.32 kB	2016-10-20 07:20:38	Download

hierarchy

"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
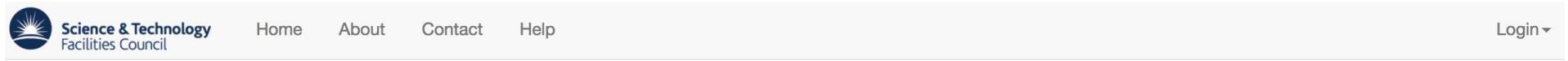
"facilities" – The facility specific options

- `"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	https ⇅	2.39 MB	1 second		LILS	Available
	✓ https					
	globus					

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

Reoccurring constructs

Reoccurring constructs

Reoccurring constructs

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",

            "jpqlFilter": "CONCAT(investigation.name, '-', investigation.visitId)",

            "jpqlSort": "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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ISIS / HIFI / cycle_15_4 / *Visit*   **Results: 1**

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

Visit Details   Visit 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

```json
"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)