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://icat.diamond.ac.uk)
    - [https://data.isis.stfc.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
{
    "site": {
        "topcatUrl": "https://localhost:8181",
        "home": "my-data",
        "enableEuCookieLaw": true,
        "paging": {
            "breadcrumb": {
                "maxTitleLength": 30
            },
            "search": {
            },
            "browse": {
            },
            "cart": {
            },
            "myDownloads": {
            },
            "pages": [
            ],
            "facilities": [
            ]
        }
    }
}
```
Tips & Tricks

- Use an editor with code folding

- **Copy other facilities**
  - Look at their “topcat.json”s
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Tips & Tricks
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

```json
1{}
2
"site": {
  ...,  
  },
219
220
"facilities": [ ... ]
1245
1246 }
1246 }
```
“site” – The global configuration options

- "home"
- "enableEuCookieLaw"
- "paging"
- "breadcrumb"
- "search"
- "browse"
- "cart"
- "myDownloads"
- "pages"
“site” – The global configuration options

```json

{  
  "site": {  
    "topcatUrl": "https://localhost:8181",  
    "home": "my-data",  
    "enableEuCookieLaw": true,  
    "paging": {  
      
    },  
    "breadcrumb": {  
      "maxTitleLength": 30  
    },  
    "search": {  
      
    },  
    "browse": {  
      
    },  
    "cart": {  
      
    },  
    "myDownloads": {  
      
    },  
    "pages": [  
      
    ],  
    "facilities": [  
      
    ]  
  }  
}
```
“site” – The global configuration options

- "home"
- "enableEuCookieLaw"
- "paging"
- "breadcrumb"
- "search"
- "browse"
- "cart"
- "myDownloads"
- "pages"
“site” – The global configuration options
“site” – The global configuration options

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- "paging"
- "breadcrumb"
- "search"
- "browse"
- "cart"
- "myDownloads"
- "pages"
"site" – The global configuration options

```json
{
    "site": {
        "topcatUrl": "https://localhost:8181",
        "home": "my-data",
        "enableEuCookieLaw": true,
        "paging": {
            "breadcrumb": {
                "maxTitleLength": 30
            },
            "search": {
            },
            "browse": {
                "gridOptions": {
                },
                "metaTabs": [
                ],
                "cart": {
                },
                "myDownloads": {
                },
                "pages": [
                ],
                "facilities": [
                ]
            }
        }
    }
}
```
“site” – The global configuration options

- "home"
- "enableEuCookieLaw"
- "paging"
- "breadcrumb"
- "search"
- "browse"
- "cart"
- "myDownloads"
- "pages"
“site” – The global configuration options

```json
"myDownloads": {
  "gridOptions": {
    "stateName": "about",
    "addToNavBar": {
      "linkLabel": "MAIN_NAVIGATION.ABOUT",
      "align": "left"
    }
  },
  "pages": [
  ]
},
"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": [
    "facility",
    "proposal",
    "investigation",
    "dataset",
    "datafile"
]
"hierarchy": [
  "facility",
  "instrument",
  "facilityCycle",
  "investigation",
  "dataset",
  "datafile"
]
### Datafile

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<th>Modified Time</th>
<th>Actions</th>
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<td>quia/facere/ut</td>
<td>508.84 kB</td>
<td>2016-10-20 07:20:38</td>
<td>Download</td>
</tr>
<tr>
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<td>recusandae/architecto/exercitation...</td>
<td>169.38 kB</td>
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<tr>
<td>Datafile 100</td>
<td>quia/beatae/ut</td>
<td>715.24 kB</td>
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<td>Download</td>
</tr>
<tr>
<td>Datafile 11</td>
<td>doloribus/quia/et</td>
<td>310.06 kB</td>
<td>2016-10-20 07:20:38</td>
<td>Download</td>
</tr>
<tr>
<td>Datafile 12</td>
<td>ut/asperiores/ut</td>
<td>217.79 kB</td>
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<tr>
<td>Datafile 13</td>
<td>sed/ir/est</td>
<td>464.63 kB</td>
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<td>Download</td>
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<tr>
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</tr>
</tbody>
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hierarchy
“facilities” – The facility specific options

- "name"
- "title"
- "idsUrl"
- "hierarchy"
- "authenticationTypes"
- "downloadTransportTypes"
- "admin"
- "myData"
- "browse"
"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"
}
]
### Download

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<th>Facility</th>
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<td>1 second</td>
<td>LILS</td>
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</table>
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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Reoccurring constructs

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Reoccurring constructs

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<td>2016-10-27</td>
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<td>Proposal 14 - 3</td>
<td>145.63 MB</td>
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<td>2016-10-27</td>
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</table>
Reoccurring constructs

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<td>LILS</td>
<td>Available</td>
<td>Remove</td>
</tr>
</tbody>
</table>

Total size: 2.39 MB
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

```json
"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}}"
    }
    ]
}
```
<table>
<thead>
<tr>
<th>Title</th>
<th>Visit Id</th>
<th>Name</th>
<th>Size</th>
<th>Beamline</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
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<td>2016-02-16</td>
<td>2016-02-18</td>
</tr>
<tr>
<td>Calibration cycle 2015-4</td>
<td>1</td>
<td>1635015</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Proposal:** 1635015  
**Title:** Calibration cycle 2015-4  
**Start Date:** 2016-02-16  
**End Date:** 2016-02-18
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": 
                    },
                    {
                        "label": 
                    },
                    {
                        "label": 
                    }
                ]
            }
        ]
    }
]
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 the 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)