Issues with capabilities-configured authentication methods
(TOPCAT perspective)

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TAP endpoints

Consider e.g. `sync` endpoint:

- TAP 1.0:
  - ▷ sync endpoint is at `<base-url>/sync`

- TAP 1.1:
  - ▷ `<base-url>/capabilities` doc can contain multiple interfaces with different URLs

```
<capability standardID="ivo://ivoa.net/std/TAP#sync-1.1">
  <interface xsi:type="vs:ParamHTTP" role="std" version="1.1">
    <accessURL use="base">http://www.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/tap/sync</accessURL>
  </interface>
  <interface xsi:type="vs:ParamHTTP" role="std" version="1.1">
    <accessURL use="base">http://www.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/tap/auth-sync</accessURL>
    <securityMethod standardID="http://www.w3.org/Protocols/HTTP/1.0/spec.html#BasicAA"/>
  </interface>
  <interface xsi:type="vs:ParamHTTP" role="std" version="1.1">
    <accessURL use="base">http://www.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/tap/sync</accessURL>
    <securityMethod standardID="ivo://ivoa.net/sso#cookie"/>
  </interface>
  <interface xsi:type="vs:ParamHTTP" role="std" version="1.1">
    <accessURL use="base">https://www.cadc-ccda.hia-iha.nrc-cnrc.gc.ca/tap/sync</accessURL>
    <securityMethod standardID="ivo://ivoa.net/sso#tls-with-certificate"/>
  </interface>
  ...
</capability>
```

Same for other endpoints (`async`, `tables`, `capabilities`, `availability`)

Capabilities options

TAP 1.0:

	default
capabilities	x
availability	x
tables	x
sync	x
async	x

Capabilities options

TAP 1.0:

	default
capabilities	x
availability	x
tables	x
sync	x
async	x

CADC TAP 1.1:

	default	BasicAA	cookie	tls-with-cert
capabilities	x			
availability	x			
tables	x	x	x	x
sync	x	x	x	x
async	x	x	x	x

Capabilities options

TAP 1.0:

	default
capabilities	x
availability	x
tables	x
sync	x
async	x

CADC TAP 1.1:

	default	BasicAA	cookie	tls-with-cert
capabilities	x			
availability	x			
tables	x	x	x	x
sync	x	x	x	x
async	x	x	x	x

some other TAP?:

	default	BasicAA	cookie	tls-with-cert
capabilities	x		x	x
availability	x			
tables		x		x
sync	x		x	
async				x

Issues

- **Making sense of capabilities:**
  - I can understand TAP 1.0 capabilities
  - I can make sense of CADC capabilities by eye
  - I can envisage legal capabilities docs that don't represent a coherent set of TAP endpoints
    - ▷ What do I do if I find that?
    - ▷ Is there a document somewhere assuring me it won't happen?

- **Locating endpoints**
  - In TAP 1.0 I could infer from a TAP base URL where all endpoints are
  - In TAP 1.1 I have to read the capabilities doc before I can start to do any TAP stuff
    - ▷ TOPCAT needs to wait to read capabilities before any TAP GUI
    - ▷ STILTS needs to make a pre-call to read capabilities before making TAP query

- **User interface**
  - If I have identified multiple alternative interfaces, how/where do I interact with the user to determine which to use?