Open ID Connect for dCache

Configuration to Support OIDC Authentication in dCache

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HELMHOLTZ RESEARCH FOR GRAND CHALLENGES

DESY.

Requirements to Support for OIDC

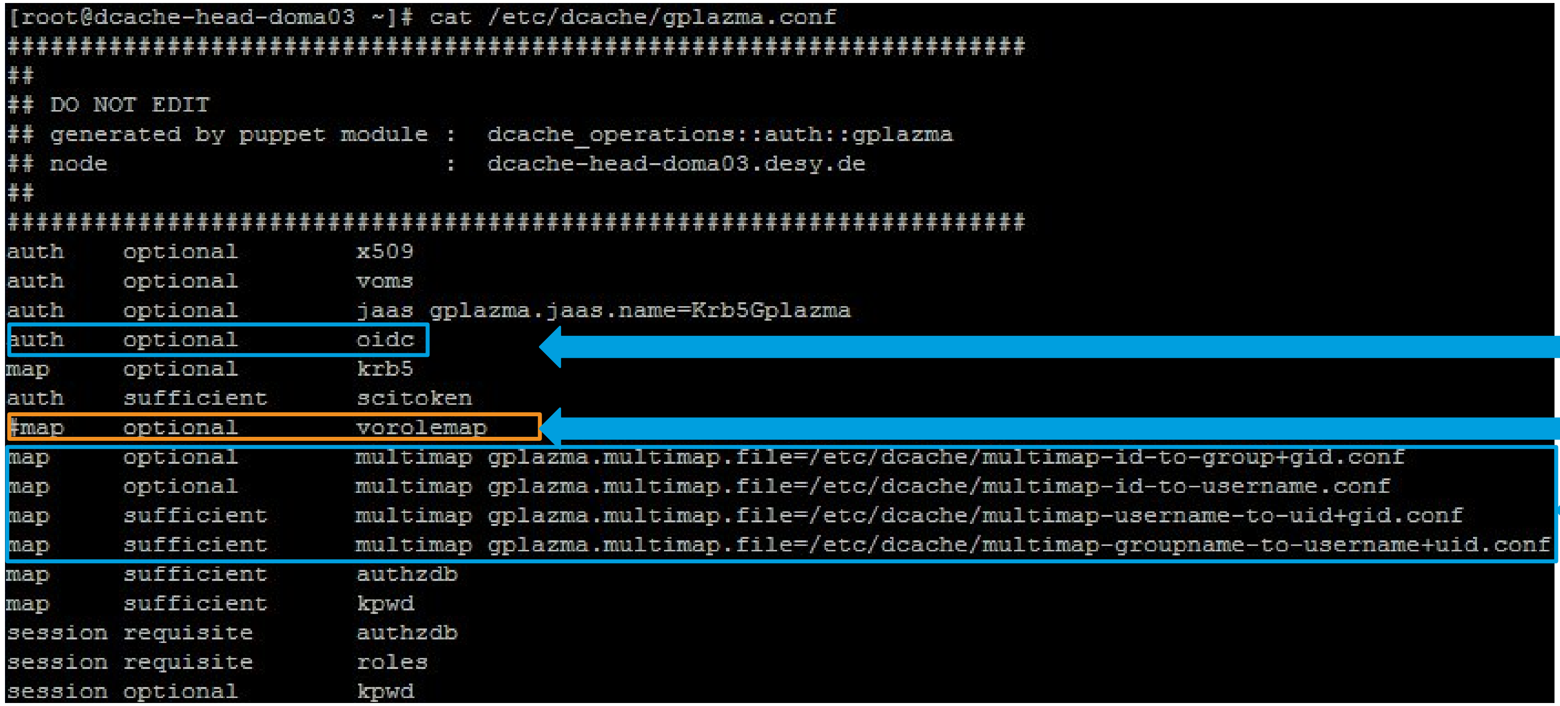
Release and Services of dCache

- Running dCache installation
- Suggest: latest feature release 6.0 (continued fixes to OIDC plug-in and user mapping)
- Required services:
  - gPlazma with specific configuration
  - Dedicated WebDav door
  - Frontend optional
  - Pools to store data
- Browser-friendly host certificates recommended ➡ avoid security exceptions handling in browser
  - Installed on WebDav Doors
  - Installed on dCache Pools

Enable OIDC Support in gPlazma

Introduction to multimap and OIDC Plug-ins in dCache

- Dedicated OIDC plugin for authenticating
- For Mapping use `multimap` plug-in: map many different credentials to dCache `uid` and `gid`
- Changes to `gPlazma.conf` file



```
[root@dcache-head-doma03 ~]# cat /etc/dcache/gplazma.conf
######################################################################
##
## DO NOT EDIT
## generated by puppet module :  dcache_operations::auth::gplazma
## node                      :  dcache-head-doma03.desy.de
##
######################################################################
auth    optional        x509
auth    optional        voms
auth    optional        jaas gplazma.jaas.name=Krb5Gplazma
auth    optional        oidc
map     optional        krb5
auth    sufficient      scitoken
#map    optional        vorolemap
map     optional        multimap gplazma.multimap.file=/etc/dcache/multimap-id-to-group+gid.conf
map     optional        multimap gplazma.multimap.file=/etc/dcache/multimap-id-to-username.conf
map     sufficient      multimap gplazma.multimap.file=/etc/dcache/multimap-username-to-uid+gid.conf
map     sufficient      multimap gplazma.multimap.file=/etc/dcache/multimap-groupname-to-username+uid.conf
map     sufficient      authzdb
map     sufficient      kpwd
session requisite       authzdb
session requisite       roles
session optional        kpwd
```

Enable `oidc` authentication plugin

Replacing usual `vorolemap` plug-in

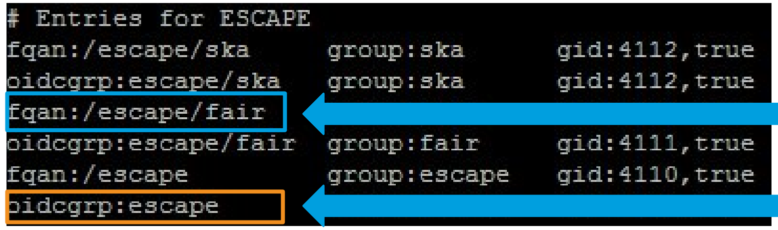
Configuring `multimap` plug-in

Setting up the Different Mutlimap Files

Mapping incoming OIDC Credentials of Well Known to Internal Users

- Some users well known to the local admin

1. Map incoming credentials to groups: `multimap-id-to-group+gid.conf`



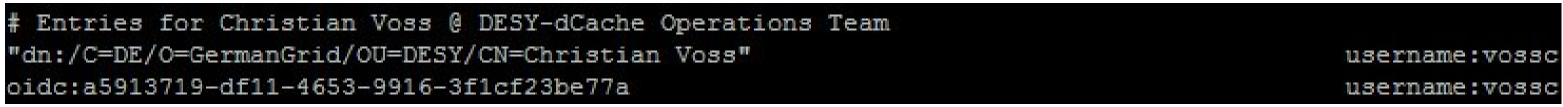
```
# Entries for ESCAPE
fqan:/escape/ska       group:ska        gid:4112,true
oidcgrp:escape/ska     group:ska        gid:4112,true
fqan:/escape/fair
oidcgrp:escape/fair    group:fair       gid:4111,true
fqan:/escape           group:escape     gid:4110,true
oidcgrp:escape
```

Mapping normal proxy *fqan*

Mapping OIDC group contained in token

- Map to group called escape with group-id 4110
- *true* indicates primary group

2. Map well known individual user credentials: `multimap-id-to-username.conf`

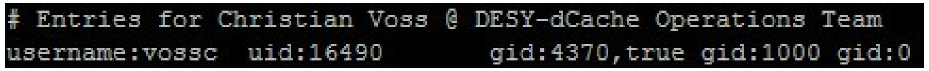


```
# Entries for Christian Voss @ DESY-dCache Operations Team
"dn:/C=DE/O=GermanGrid/OU=DESY/CN=Christian Voss"                       username:vossc
oidc:a5913719-df11-4653-9916-3f1cf23be77a                               username:vossc
```

Mapping proxy *dn*

Mapping *oidc* token

3. Map dCache internal user to user-id: `multimap-username-to-uid+gid.conf`



```
# Entries for Christian Voss @ DESY-dCache Operations Team
username:vossc  uid:16490       gid:4370,true gid:1000 gid:0
```

My DESY user-id

DESY grid group-id

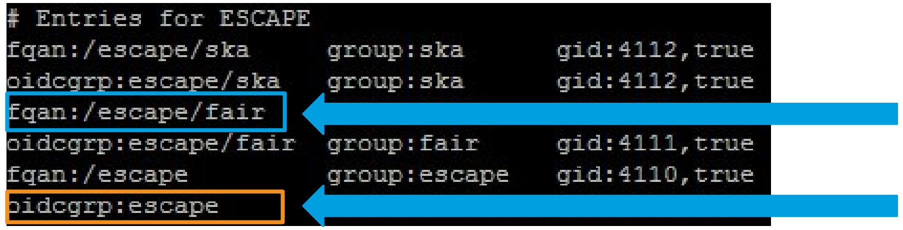
DESY additional group-ids

Setting up the Different Mutlimap Files

Mapping incoming OIDC Credentials of Unknown Users to Internal Users

- Not all incoming users known to local admin ➡configure default fallback users

1. Map incoming credentials to groups: `multimap-id-to-group+gid.conf`



```
# Entries for ESCAPE
fqan:/escape/ska      group:ska       gid:4112,true
oidcgrp:escape/ska    group:ska       gid:4112,true
fqan:/escape/fair
oidcgrp:escape/fair   group:fair      gid:4111,true
fqan:/escape          group:escape    gid:4110,true
oidcgrp:escape
```

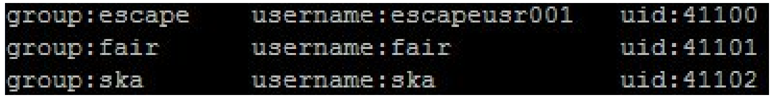
Mapping normal proxy *fqan*

Mapping OIDC group contained in token

   - Map to group called escape with group-id 4110
   - `true` indicates primary group

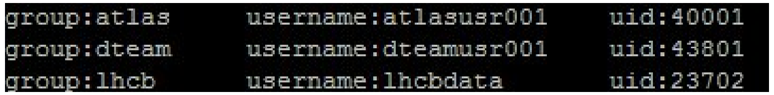
2. None of the specific users will match

3. Map to dCache internal default user-id: `multimap-groupname-to-username+uid.conf`



```
group:escape      username:escapeusr001    uid:41100
group:fair        username:fair            uid:41101
group:ska         username:ska             uid:41102
```

   - Anyone mapped to group `escape` handled as user `escapeusr001`
   - Similar approach to mapping VO users

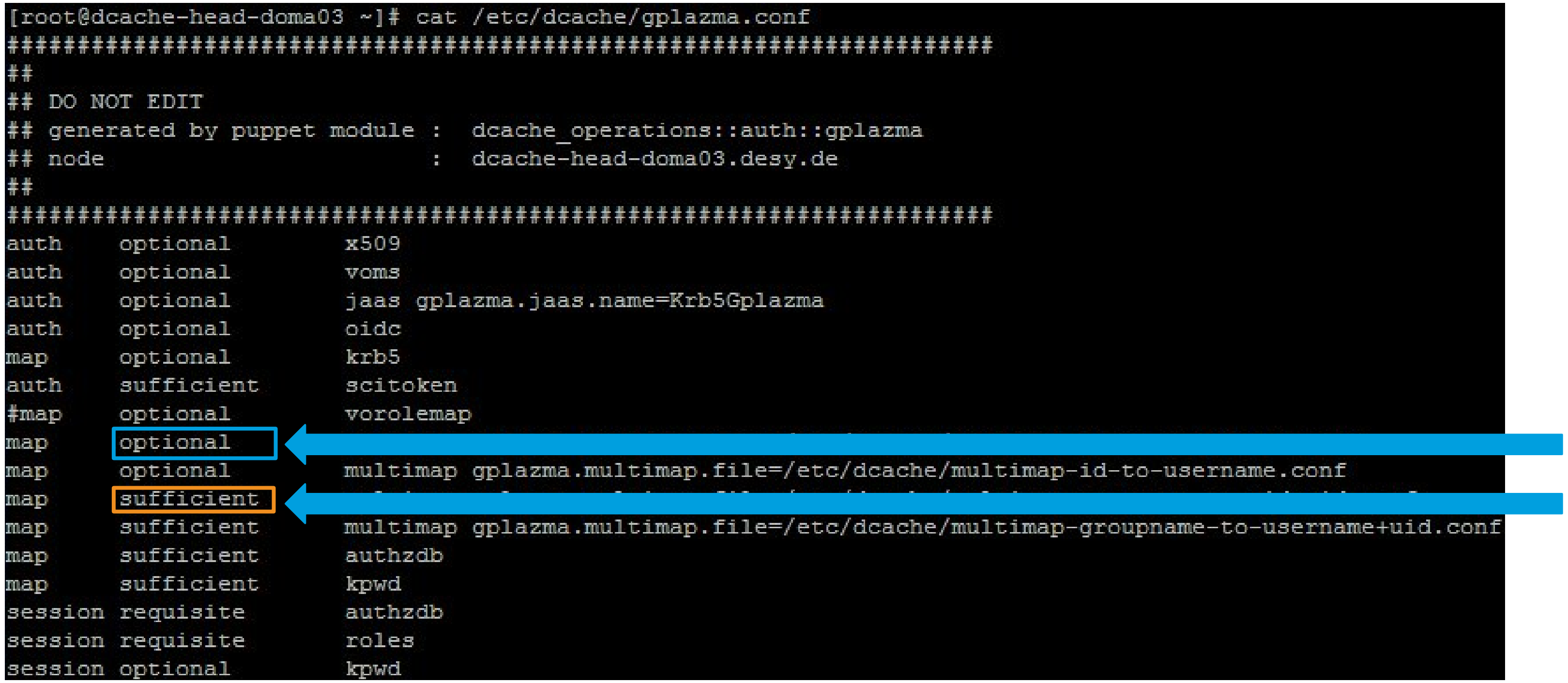


```
group:atlas      username:atlasusr001    uid:40001
group:dteam      username:dteamusr001    uid:43801
group:lhcb       username:lhcbdata       uid:23702
```

Assure User Mapping and Granting Access

Step Back to `gPlazma` Configuration and `/etc/grid-security/storage-authzdb`

- Assure well known mapping is not overwritten by default users



```
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######################################################################
##
## DO NOT EDIT
## generated by puppet module :  dcache_operations::auth::gplazma
## node                       :  dcache-head-doma03.desy.de
##
######################################################################
auth     optional        x509
auth     optional        voms
auth     optional        jaas gplazma.jaas.name=Krb5Gplazma
auth     optional        oidc
map      optional        krb5
auth     sufficient      scitoken
#map     optional        vorolemap
map      optional
map      optional        multimap gplazma.multimap.file=/etc/dcache/multimap-id-to-username.conf
map      sufficient
map      sufficient      multimap gplazma.multimap.file=/etc/dcache/multimap-groupname-to-username+uid.conf
map      sufficient      authzdb
map      sufficient      kpwd
session requisite        authzdb
session requisite        roles
session optional         kpwd
```
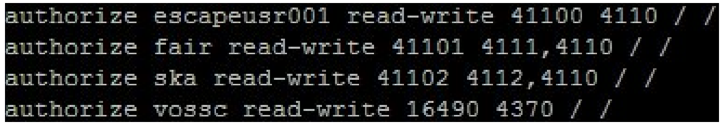

`optional` continues mapping

`sufficient` finishes mapping

- Configure write access: necessary entries in `/etc/grid-security/storage-authzdb`



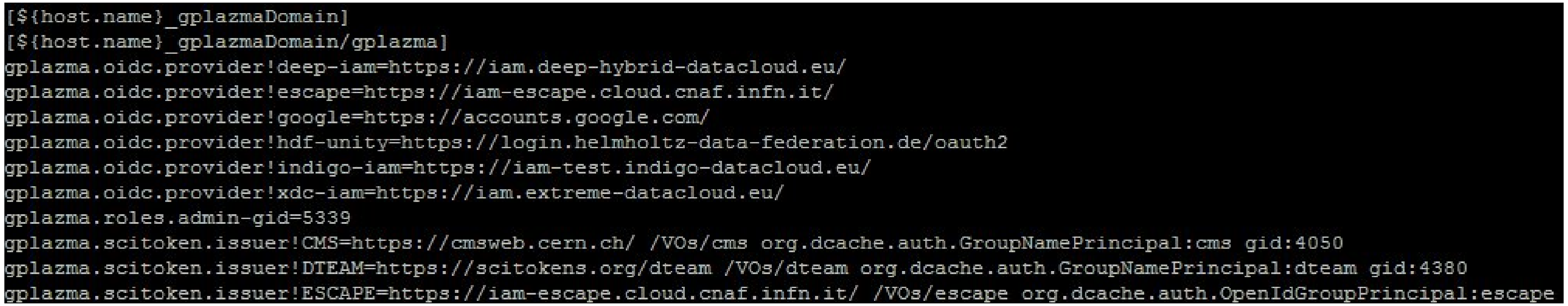
```
authorize escapeusr001 read-write 41100 4110 / /
authorize fair read-write 41101 4111,4110 / /
authorize ska read-write 41102 4112,4110 / /
authorize vossc read-write 16490 4370 / /
```

  - Similar to mapping VO users before

Configuring Layout Files

Setup `gPlazma` Configuration in `/etc/dcache/layouts/`

- Need to configure OIDC plug-in



```
[${host.name}_gplazmaDomain]
[${host.name}_gplazmaDomain/gplazma]
gplazma.oidc.provider!deep-iam=https://iam.deep-hybrid-datacloud.eu/
gplazma.oidc.provider!escape=https://iam-escape.cloud.cnaf.infn.it/
gplazma.oidc.provider!google=https://accounts.google.com/
gplazma.oidc.provider!hdf-unity=https://login.helmholtz-data-federation.de/oauth2
gplazma.oidc.provider!indigo-iam=https://iam-test.indigo-datacloud.eu/
gplazma.oidc.provider!xdc-iam=https://iam.extreme-datacloud.eu/
gplazma.roles.admin-gid=5339
gplazma.scitoken.issuer!CMS=https://cmsweb.cern.ch/ /VOs/cms org.dcache.auth.GroupNamePrincipal:cms gid:4050
gplazma.scitoken.issuer!DTEAM=https://scitokens.org/dteam /VOs/dteam org.dcache.auth.GroupNamePrincipal:dteam gid:4380
gplazma.scitoken.issuer!ESCAPE=https://iam-escape.cloud.cnaf.infn.it/ /VOs/escape org.dcache.auth.OpenIdGroupPrincipal:escape
```

- Configure OIDC provider: pick the `iam-escape` option

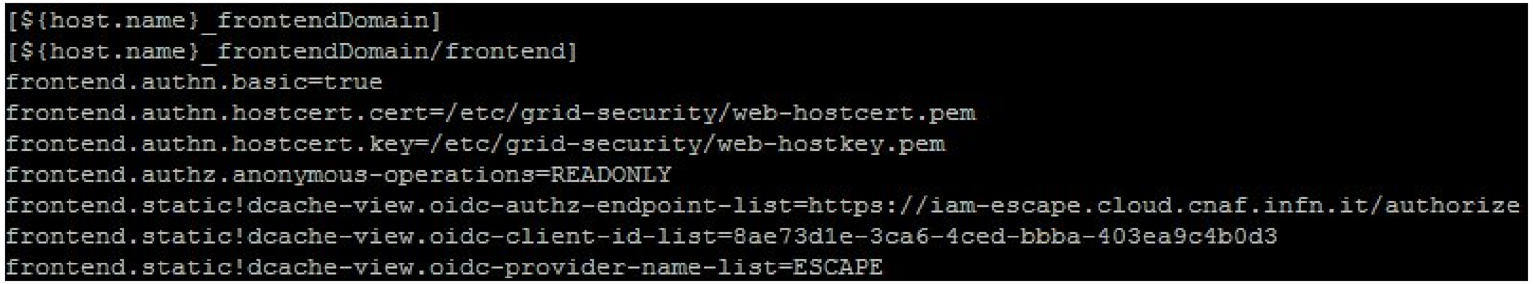
- Completeness: `scitoken` issuer also shown

- Changes require restart of Domain containing the `gPlazma` service

Configuring Layout Files

Setup `Frontend/WebDav` Configuration in `/etc/dcache/layouts/`

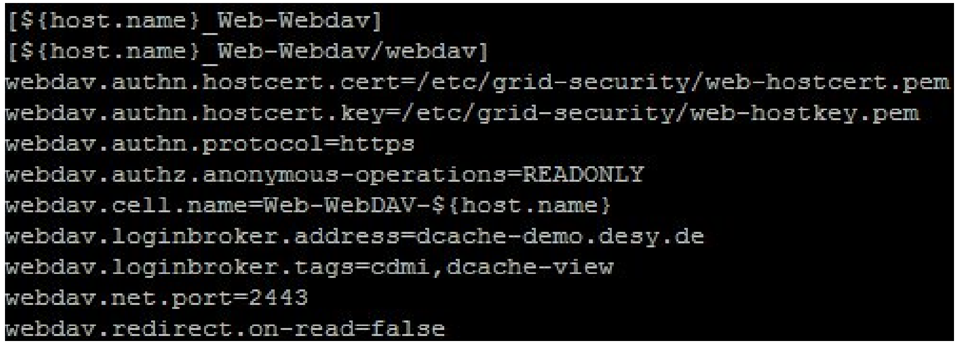
- Need to configure **`Frontend`** to use OIDC endpoint



```
[${host.name}_frontendDomain]
[${host.name}_frontendDomain/frontend]
frontend.authn.basic=true
frontend.authn.hostcert.cert=/etc/grid-security/web-hostcert.pem
frontend.authn.hostcert.key=/etc/grid-security/web-hostkey.pem
frontend.authz.anonymous-operations=READONLY
frontend.static!dcache-view.oidc-authz-endpoint-list=https://iam-escape.cloud.cnaf.infn.it/authorize
frontend.static!dcache-view.oidc-client-id-list=8ae73d1e-3ca6-4ced-bbba-403ea9c4b0d3
frontend.static!dcache-view.oidc-provider-name-list=ESCAPE
```

- Need to register **`Frontend`** service as a client with ESCAPE `IAM`

- Provide path to browser-friendly host certificates similar for the associated **`WebDav`** door



```
[${host.name}_Web-Webdav]
[${host.name}_Web-Webdav/webdav]
webdav.authn.hostcert.cert=/etc/grid-security/web-hostcert.pem
webdav.authn.hostcert.key=/etc/grid-security/web-hostkey.pem
webdav.authn.protocol=https
webdav.authz.anonymous-operations=READONLY
webdav.cell.name=Web-WebDAV-${host.name}
webdav.loginbroker.address=dcache-demo.desy.de
webdav.loginbroker.tags=cdmi,dcache-view
webdav.net.port=2443
webdav.redirect.on-read=false
```

- Changes require restart of Domain containing the **`Frontend`** and **`WebDav`** services

Thank you