

dCache Interface

Sage2

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Brief Introduction to dCache

“A distributed storage solution that can employ several systems without user awareness”

Door: Protocol translation layer

Namespace: dCache provides a single rooted hierarchical file system view of stored data

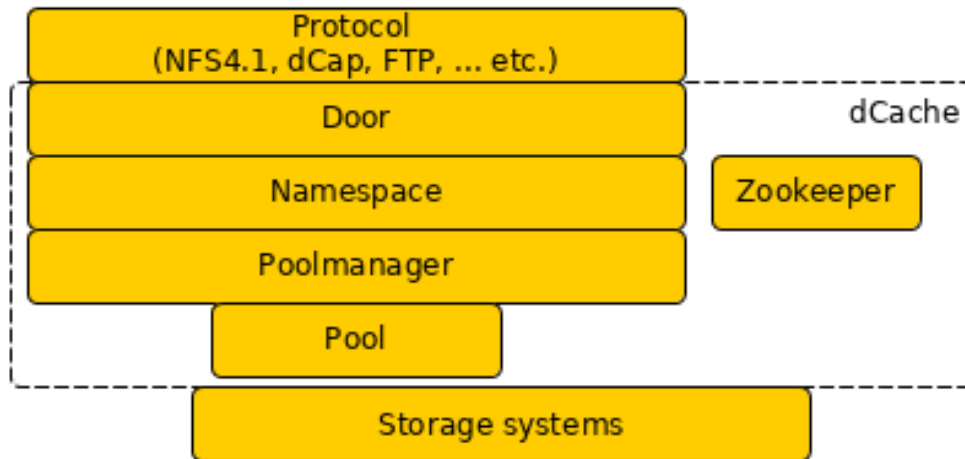
Poolmanager: Decides on how to handle incoming requests

Pool: Data storage

Zookeeper: Distributed directory and coordination service used by dCache

Available interfaces:

- dCap,
- FTP,
- xrootd,
- NFSv4.1,
- WebDav
- SRM



Connecting dCache to Cortx/Motr [1/2]

Option 1: dCache Cortx interface

Would be based on an existing Ceph interface implementation.

Requires adjusting of:

- **FileStore**; for moving data
- **ReplicaStore**; overlaying data mover, also deals with metadata

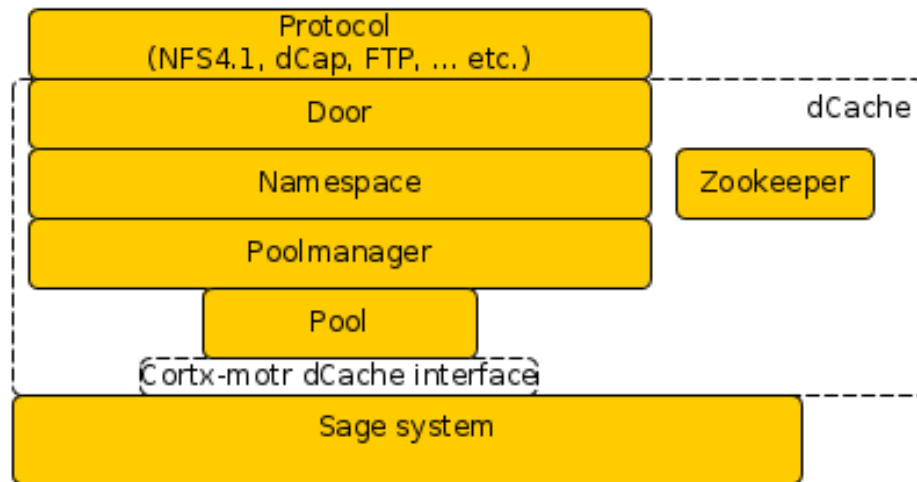
Advantages:

Direct dCache access to Cortx/Motr

Disadvantages:

Substantial effort

(Development, maintaining ... etc)



Connecting dCache to Cortx/Motr [2/2]

Option 2: dCache TSS interface to Cortx/Motr

dCache Tertiary Storage System (TSS) interface uses a predefined executable to run: **put**, **get** and **remove**, to migrate data

Advantages:

Easy to implement

Portable

No changes to dCache required (Only configs)

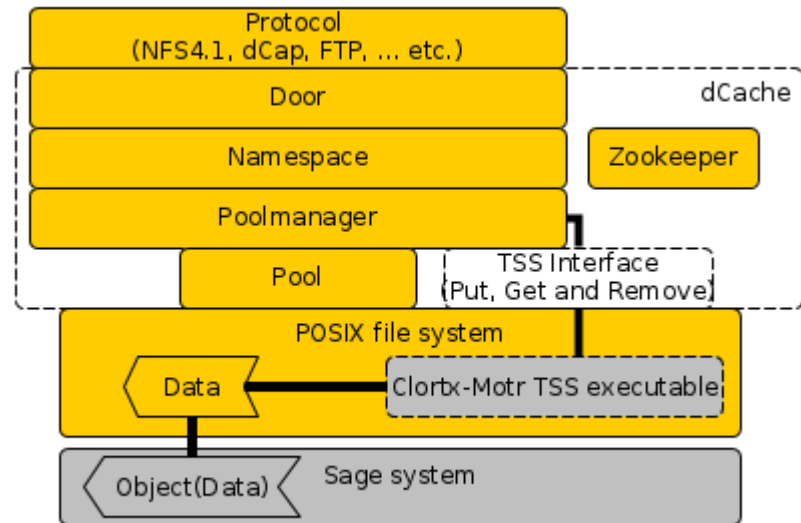
Objects can be managed with other tools

(Requires careful manipulation)

Disadvantages:

Data has to be staged on a separate file system

dCache is decoupled from Cortx-Motr functionalities



Cortx-Motr TSS Executable

The executable `cortx_tss.sh` implements `put`, `get` and `remove`.

Put:

```
put<pnfsID><filename>-si=<storage-information> [<other-options>...]
```

Example:

```
./cortx_tss.sh put 0000B9A58FDB93F04DA8A7208076BF37A08F  
/mnt/dcache/data/0000B9A58FDB93F04DA8A7208076BF37A08F -  
si=size=964536;new=true;stored=false;sClass=<Unknown>:<Unknown>;cClass=-;hsm=osm;accessLatency=ONLINE;retentionPolicy=REPLICA;uid=1000;path=/home/tester/test-file-1;gid=1000;links=0000C8D99E11494242EBA972A6E66C41EF26 test-file-1;flag-c=1:3d1ae86e;store=<Unknown>;group=<Unknown>;bfd=<Unknown>;
```

→ Object ID (128bit) is create using `sha1sum` on the URI which contains the `pnfsid`

Get:

```
get <pnfsID> <filename> -si=<storage-information> -uri=<storage-uri> [<other-options>...]
```

Example:

```
./cortx_tss.sh get 0000B9A58FDB93F04DA8A7208076BF37A08F  
/mnt/dcache/data/0000B9A58FDB93F04DA8A7208076BF37A08F -  
si=size=964536;new=false;stored=false;sClass=<Unknown>:<Unknown>;cClass=-;hsm=osm;accessLatency=NEARLINE;retentionPolicy=CUSTODIAL;uid=1000;gid=1000;links=0000C8D99E11494242EBA972A6E66C41EF26 -uri=osm://osm/?store=<Unknown>&group=<Unknown>&bfd=2019004624.2019004624 test-file-1;store=<Unknown>;group=<Unknown>;bfd=<Unknown>
```

Remove:

```
remove -uri=<storage-uri> [<other-options>...]
```

Example:

```
./cortx_tss.sh remove -uri=osm://osm/?store=<Unknown>&group=<Unknown>&bfd=2019004624.2019004624 test-file-1;store=<Unknown>;group=<Unknown>;bfd=<Unknown>
```



Moving Files to Cortx/Motr

From the admin interface:

```
[client-27] (local) admin > \c pool1
[client-27] (pool1@dCacheDomain) admin > rep ls
0000B9A58FDB93F04DA8A7208076BF37A08F <C-----X--L(0)[0]> 964536 si={<Unknown>:<Unknown>}

[client-27] (pool1@dCacheDomain) admin > flush pnfsid 0000B9A58FDB93F04DA8A7208076BF37A08F
Flush Initiated
```

dCache-Cortx.log

```
----- put 0000B9A58FDB93F04DA8A7208076BF37A08F /mnt/dcache/data/0000B9A58FDB93F04DA8A7208076BF37A08F -si=size=964536
cessLatency=ONLINE;retentionPolicy=REPLICA;uid=1000;path=/home/tester/test-file-1;gid=1000;links=0000C8D99E11494242EBA
known>;bfid=<Unknown>; Thu Nov 4 18:25:29 CET 2021
0000B9A58FDB93F04DA8A7208076BF37A08F : Request for put started Thu Nov 4 18:25:29 CET 2021
0000B9A58FDB93F04DA8A7208076BF37A08F : storageinfo.StoreName :
0000B9A58FDB93F04DA8A7208076BF37A08F : storageinfo.store : <Unknown>
0000B9A58FDB93F04DA8A7208076BF37A08F : storageinfo.group : <Unknown>
0000B9A58FDB93F04DA8A7208076BF37A08F : storageinfo.hsm : osm
0000B9A58FDB93F04DA8A7208076BF37A08F : storageinfo.accessLatency : ONLINE
0000B9A58FDB93F04DA8A7208076BF37A08F : storageinfo.retentionPolicy : REPLICA
0000B9A58FDB93F04DA8A7208076BF37A08F : Created identifier : osm://osm/?store=<Unknown>&group=<Unknown>&bfid=2019004624
0000B9A58FDB93F04DA8A7208076BF37A08F : Request 'put' finished at Thu Nov 4 18:25:37 CET 2021 with return code 0
```



Demo!



Thank You

