

Unit VI – Basic SRM building blocks

Task 0 – Configuring Chimera

Task 0.1 Configuring Directory tags

- Create a VO directory
`/pnfs/dcache.org/data/desy`
- Set permissions
 - Initially we set the directory permissions to world readable/writable until we have the set up resolved.

```
[root@hal9000 data]# ls -ld desy
drwxr-xr-x  2 root root 512 Apr 28 22:40 desy
[root@hal9000 data]# chmod 777 desy/
[root@hal9000 data]# cd desy
[root@hal9000 desy]# echo GENERATED >".(tag)(sGroup)"
[root@hal9000 desy]# echo "StoreName desy" >".(tag)(OSMTemplate)"
```

Task 1 – Enabling space management

Task 1.1 Configuring dCache to use space management

- Edit dCacheSetup file
`vi /opt/d-cache/config/dCacheSetup`
- Changing the values
`# srmSpaceManagerEnabled=no`
`srmSpaceManagerEnabled=yes`
`# srmImplicitSpaceManagerEnabled=yes`
`srmImplicitSpaceManagerEnabled=no`
`SpaceManagerLinkGroupAuthorizationFileName=/opt/dcache/etc/spacemanager.cfg`
- The file “SpaceManagerLinkGroupAuthorizationFileName” should have content that looks like

```
LinkGroup desy-linkGroup-Disk
/desy/Role=*
```

- This LinkGroup Name will correspond with the storage classes we will use later for reserving space in.

- Restart the SRM door

```
[root@hal9000 ~]# dcache restart srm-hal9000Domain
Using CATALINA_BASE:   /opt/d-cache/libexec/apache-tomcat-5.5.20
Using CATALINA_HOME:   /opt/d-cache/libexec/apache-tomcat-5.5.20
Using CATALINA_TMPDIR: /opt/d-cache/libexec/apache-tomcat-5.5.20/temp
Using JRE_HOME:        /usr/java/jdk1.5.0_14
```

```
Using CATALINA_BASE:   /opt/d-cache/libexec/apache-tomcat-5.5.20
Using CATALINA_HOME:   /opt/d-cache/libexec/apache-tomcat-5.5.20
Using CATALINA_TMPDIR: /opt/d-cache/libexec/apache-tomcat-5.5.20/temp
Using JRE_HOME:        /usr/java/jdk1.5.0_14
```

Pinging srm server to wake it up, will take few seconds ...
 - Unable to find required classes (javax.activation.DataHandler and javax.mail.internet.MimeMultipart). Attachment support is disabled.
 Done

Task 1.3 Configuring dCache to use space management

- Log into the administrator interface (password="dickerelch")

```
[root@hal9000 ~]# ssh -c blowfish -p 22223 -l admin `hostname` -f `
admin@hal9000.dcache.org's password:
```

```
dCache Admin (VII) (user=admin)
```

```
[hal9000.dcache.org] (local) admin >
```

- Move to the pool Manger interface and query the details.

```
[hal9000.dcache.org] (local) admin > cd PoolManager
[hal9000.dcache.org] (PoolManager) admin > psu ls -l pgroup
ResilientPools
linkList :
poolList :
default
linkList :
  default-link (pref=10/10/-1/10;;ugroups=3;pools=1)
poolList :
  hal9000_4
(enabled=true;active=22;rdOnly=false;links=0;pgroups=1;hsm=[];mode=enabled)
  hal9000_1
(enabled=true;active=23;rdOnly=false;links=0;pgroups=1;hsm=[];mode=enabled)
  hal9000_3
(enabled=true;active=22;rdOnly=false;links=0;pgroups=1;hsm=[];mode=enabled)
  hal9000_2
(enabled=true;active=22;rdOnly=false;links=0;pgroups=1;hsm=[osm];mode=enabled)
)
```

- Assigning pools to VO's
 - From the configuration so far, dCache doesn't know which of the pools should be owned by which VO. For this exercise add two pools to pgroup “desy”
 - Pools are shared among all VO's
 - We must create a PoolGroup for each VO in this case we need to do this to just one Pool and the VO will be “desy”

```

#
# This section is for <VO-name>
#
psu create pgroup <VO-name>

# This section is for <VO-name> link

psu create unit -store <VO-name>:STATIC@osm
psu create unit -store <VO-name>:GENERATED@osm

psu addto ugroup any-store <VO-name>:STATIC@osm
psu addto ugroup any-store <VO-name>:GENERATED@osm

psu create ugroup <VO-name>-groups
psu addto ugroup <VO-name>-groups <VO-name>:STATIC@osm
psu addto ugroup <VO-name>-groups <VO-name>:GENERATED@osm
psu create link <VO-name>-link world-net <VO-name>-groups
psu set link <VO-name>-link -readpref=20 -writepref=20 -cachepref=20
    ● Make each Pool in a single PoolGroup,
psu removefrom pgroup default <poolName>
    ● To add pools to such a pool group :
psu addto pgroup <VO-name> <poolName>
    ● Add PoolGroup to a Link
psu add link <VO-name>-link <VO-name>

```

- Configuring the PoolManager linkGroup.

- Now we need to create the link group.

```
psu create linkGroup <VO-name>-linkGroup-Disk
```

- To confirm this operation succeeded

```
[hal9000.dcache.org] (PoolManager) admin > psu ls -l linkGroup  
desy-linkGroup-Disk : [EMPTY]
```

Attributes:

AccessLatency:

onlineAllowed=false

nearlineAllowed=true

RetentionPolicy:

custodialAllowed=true

outputAllowed=true

replicaAllowed=true

```
[hal9000.dcache.org] (PoolManager) admin >
```

- Note defaults are for a Tape backed dCache, as Online not allowed by default. We need to change this explicitly.

```
[hal9000.dcache.org] (PoolManager) admin > psu set linkGroup replicaAllowed  
<linkGroup> true
```

```
[hal9000.dcache.org] (PoolManager) admin > psu set linkGroup onlineAllowed  
<linkGroup> true
```

```
[hal9000.dcache.org] (PoolManager) admin > save
```

- Now we should add some space properties to the link group.

```
psu set linkGroup custodialAllowed <linkGroup> <true|false>
```

```
psu set linkGroup replicaAllowed <linkGroup> <true|false>
```

```
psu set linkGroup nearlineAllowed <linkGroup> <true|false>
```

```
psu set linkGroup outputAllowed <linkGroup> <true|false>
```

```
psu set linkGroup attribute <linkGroup> [-r] attribute=value
```

```
psu set linkGroup onlineAllowed <linkGroup> <true|false>
```

- So we now need to add links to our link group.

```
psu addto linkGroup desy-linkGroup-Disk desy-link
```

- Now to confirm the set up with dCache.

```
[hal9000.dcache.org] (PoolManager) admin > free
```

```
desy-linkGroup-Disk : 524288000
```

- Now we must save our changes.

```
[hal9000.dcache.org] (PoolManager) admin > save
```

```
[hal9000.dcache.org] (PoolManager) admin >
```

- Reserving a static space

```
[hal9000.dcache.org] (local) admin > cd SrmSpaceManager
```

- Now since we have recently changed the properties of the PoolManager settings to propagate the SrmSpaceManager we can speed it up with the following command

```
[hal9000.dcache.org] (SrmSpaceManager) admin > update link groups
```

```
update started
```

- Now we should wait 10 seconds or so for the effects to reach the SrmSpaceManager

```
[hal9000.dcache.org] (SrmSpaceManager) admin > ls
```

Reservations:

total number of reservations: 0

total number of bytes reserved: 0

- Now we can reserve some space (Please note down the spacetoken ID)

```
[hal9000.dcache.org] (SrmSpaceManager) admin > reserve -vor=NULL -vog=/desy
-acclat=ONLINE -retpol=REPLICA -lgid=0 -desc=DISK 30000 "-1"
10007 voGroup:/desy voRole:NULL linkGroupId:0 size:30000 created:Tue Apr 29
09:45:14 CEST 2008 lifetime:-1ms expiration:NEVER descr:DISK state:RESERVED
used:0 allocated:0
```

Task 1.5 Checking you can write to a space.

- Querying a space token

```
[ui_user@hal9000 ~]$ srm-get-space-metadata
srm://hal9000.dcache.org:8443/pnfs/dcache.org/data/desy/ -space_tokens=10007
WARNING: SRM_PATH is defined, which might cause a wrong version of srm client
to be executed
WARNING: SRM_PATH=/opt/d-cache/srm
Space Reservation with token=10007
          owner:VoGroup=/desy VoRole=NULL
          totalSize:30000
          guaranteedSize:30000
          unusedSize:30000
          lifetimeAssigned:-1
          lifetimeLeft:-1
          accessLatency:ONLINE
          retentionPolicy:REPLICA
```

- Writing to a space

```
[ui_user@hal9000 ~]$ srmcp -2 -protocols=gsiftp -space_token=10007
file:///etc/group
srm://hal9000.dcache.org:8443/pnfs/dcache.org/data/desy/testfile
WARNING: SRM_PATH is defined, which might cause a wrong version of srm client
to be executed
```

- Releasing Space from a SpaceToken

```
WARNING: SRM_PATH=/opt/d-cache/srm[ui_user@hal9000 ~]$ srm-release-space
srm://hal9000.dcache.org:8443 -space_token=10010
WARNING: SRM_PATH is defined, which might cause a wrong version of srm client
to be executed
WARNING: SRM_PATH=/opt/d-cache/srm
```

- How to get SRM space tokens by description

```
[ui_user@hal9000 ~]$ srm-get-space-tokens -space_desc=DISK
srm://hal9000.dcache.org:8443
WARNING: SRM_PATH is defined, which might cause a wrong version of srm client
to be executed
WARNING: SRM_PATH=/opt/d-cache/srm
Space Reservation Tokens:
10007
```

- Process for getting which pool a file is in

```
[hal9000.dcache.org] (PnfsManager) admin > pnfsidof
/pnfs/dcache.org/data/desy/testfile
00006DADE9C9370F49FCA269CAE05D5E9F92
[hal9000.dcache.org] (PnfsManager) admin > cacheinfoof
00006DADE9C9370F49FCA269CAE05D5E9F92
hal9000_1
[hal9000.dcache.org] (PnfsManager) admin > ..
[hal9000.dcache.org] (local) admin > cd hal9000_1
[hal9000.dcache.org] (hal9000_1) admin > rep ls
00006DADE9C9370F49FCA269CAE05D5E9F92
00006DADE9C9370F49FCA269CAE05D5E9F92 <-P------(0)[0]> 585
si={desy:GENERATED}
```

- To resize a srm space token

```
[hal9000.dcache.org] (SrmSpaceManager) admin > ls
Reservations:
10007 voGroup:/desy voRole:NULL linkGroupId:0 size:30000 created:Tue Apr 29
09:45:14 CEST 2008 lifetime:-1ms expiration:NEVER descr:DISK state:RESERVED
used:0 allocated:0
total number of reservations: 1
total number of bytes reserved: 30000
```

LinkGroups:

```
0 Name:desy-linkGroup-Disk FreeSpace:524286830 ReservedSpace:30000
AvailableSpace:524256830 VOs:{/desy:*}{/desy:} onlineAllowed:true
nearlineAllowed:true replicaAllowed:true custodialAllowed:true
outputAllowed:true UpdateTime:Tue Apr 29 10:17:19 CEST 2008(1209457039965)
total number of linkGroups: 1
total number of bytes reservable: 524256830
total number of bytes reserved : 30000
last time all link groups were updated: Tue Apr 29 10:17:19 CEST
2008(1209457039965)
```

```
[hal9000.dcache.org] (SrmSpaceManager) admin > update space reservation 10007
40000
```

```
10007 voGroup:/desy voRole:NULL linkGroupId:0 size:40000 created:Tue Apr 29
09:45:14 CEST 2008 lifetime:-1ms expiration:NEVER descr:DISK state:RESERVED
used:0 allocated:0
```

- To enable implicit space reservation

- modify /opt/d-cache/config/dCacheSetup

```
# will have no effect if srmSpaceManagerEnabled is "no"
# srmImplicitSpaceManagerEnabled=yes
srmImplicitSpaceManagerEnabled=yes
```

- Restart dcache srm component

- And now write to dcache with access latency and retention policy.

```
[ui_user@hal9000 ~]$ srmcp -2 -protocols=gsiftp -access_latency=ONLINE
-retention_policy=REPLICA file://///etc/group
srm://hal9000.dcache.org:8443/pnfs/dcache.org/data/desy/testfile1
WARNING: SRM_PATH is defined, which might cause a wrong version of srm client
to be executed
WARNING: SRM_PATH=/opt/d-cache/srm
```

- How to write to dcache with globus URL copy example

```
globus-url-copy \
  file://///etc/fstab \
  gsiftp://hal9000.dcache.org/pnfs/dcache.org/data/desy/wurst
```

- Setting Default Storage Policies for non SRM space token aware transfers
 - Modify dCacheSetup
 - Enable a Default Retention Policy
 - Set defaults of DefaultRetentionPolicy

```
# ----if space reservation request does not specify retention policy
#   we will assign this retention policy by default
# SpaceManagerDefaultRetentionPolicy=CUSTODIAL
SpaceManagerDefaultRetentionPolicy=REPLICA
#
# ----if space reservation request does not specify access latency
#   we will assign this access latency by default
# SpaceManagerDefaultAccessLatency=NEARLINE
SpaceManagerDefaultAccessLatency=ONLINE
#
# ----if the transfer request come from the door, and there was not prior
#   space reservation made for this file, should we try to reserve
#   space before satisfying the request
# SpaceManagerReserveSpaceForNonSRMTransfers=false
SpaceManagerReserveSpaceForNonSRMTransfers=true
```

- Now restart SRM component of dcache server
- Confirmation that a file is written to a space works.

```
[hal9000.dcache.org] (SrmSpaceManager) admin > ls file space tokens
/pnfs/dcache.org/data/desy/testfile5
```

```
10007
```

```
[hal9000.dcache.org] (SrmSpaceManager) admin > listFilesInSpace 10007
30003 /desy NULL 10007 585 1209461220291 14399627
/pnfs/dcache.org/data/desy/testfile5 0000A9131487605A4FD6B3136A479FC540CE
Stored 0
```

- How to reserve space as a dcache client

```
[ui_user@hal9000 ~]$ srm-reserve-space \  
> -desired_size 2000 \  
> -srm_protocol_version=2 \  
> -retention_policy=REPLICA \  
> -access_latency=ONLINE \  
> -guaranteed_size 1024 \  
> -lifetime 36000 \  
> srm://hal9000.dcache.org:8443  
WARNING: SRM_PATH is defined, which might cause a wrong version of srm client  
to be executed  
WARNING: SRM_PATH=/opt/d-cache/srm  
Space token =30004
```