Pool Management and Pool selection

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Outline:

- ## How dCache store data
  namespace and pools
- ## Pool selecting mechanism
  Units : store, network, protocol

  Pool groups

  links
- ## Assigning pools to a directory
  Introducing directory tags

  Establishing a directory's storage class

  Selecting pools based on storage class
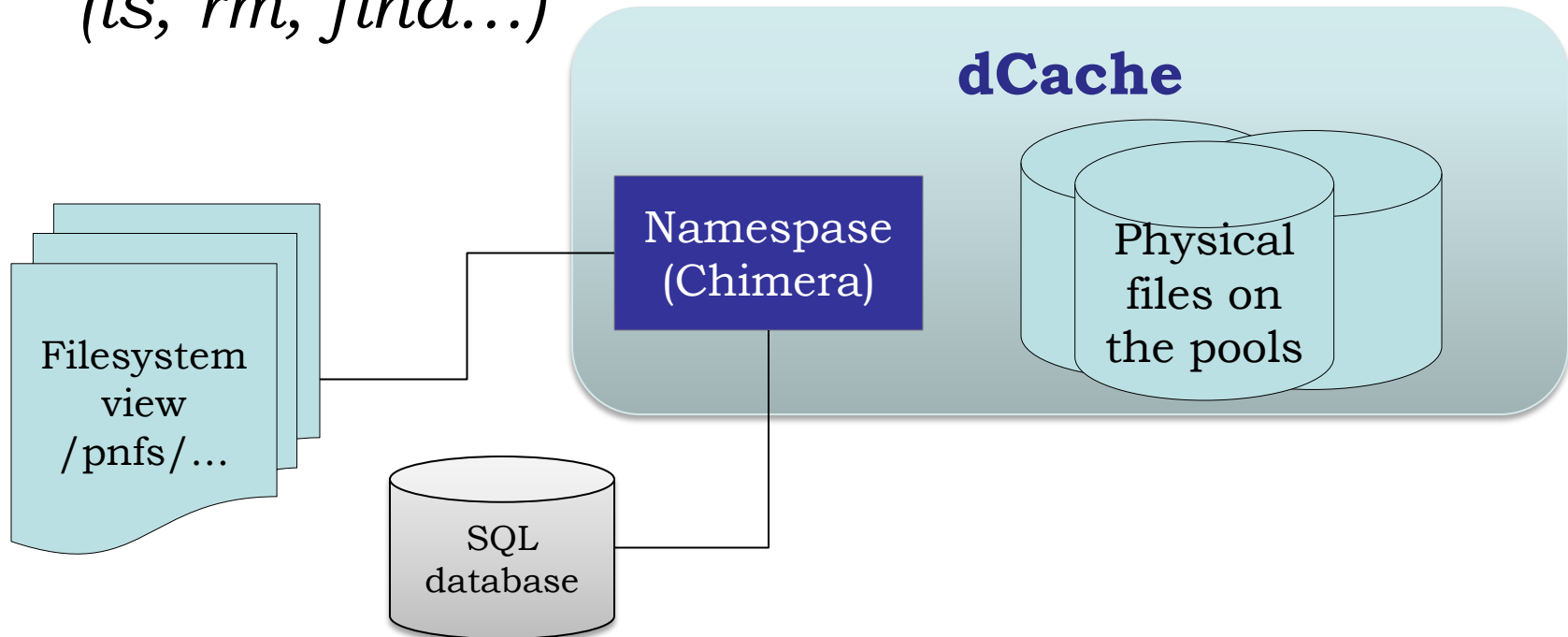
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Getting in touch with the namespace

First look at namespace:

Mount point: /pnfs   (traditionally)

Getting information with standard commands (ls, rm, find…)

dCache

Namespase
(Chimera)

Physical
files on
the pools

Filesystem
view
/pnfs/…

SQL
database

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PoolManager

- unique service of dCache domain
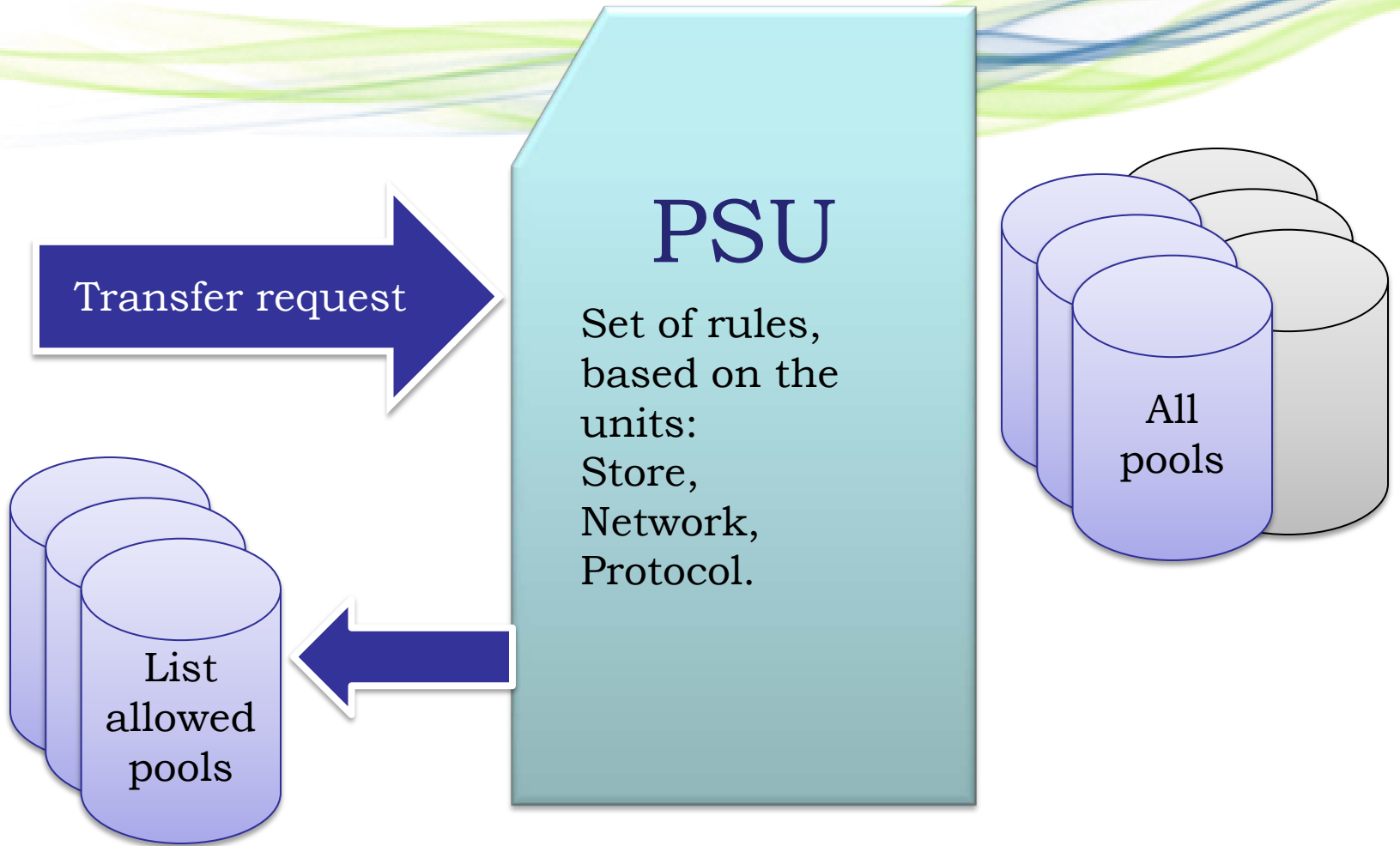- handle each file transfer request
- Decide on which pool will be used on the user's request
- Highly configurable sub-module structure
  - Sub-module PSU(Pool Selection Unit)
- Configuration file poolmanager.conf

PSU

Transfer request

PSU

Set of rules,
based on the
units:
Store,
Network,
Protocol.

List
allowed
pools

All
pools

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PSU – units

unit -store *Define location names on the system where the data will stored*

    psu create unit -store *@osm # any storage

    psu create unit -store exp1:GENERATED@osm

    psu create unit -store exp1:STATIC@osm

unit -net *Define set of (sub)networks for the allowed transfers.*

    psu create unit net 0.0.0.0/0.0.0.0

    psu create unit net 192.168.0.0/255.255.0.0

unit -protocol *Define communication protocol for the transfers*

    psu create -protocol */*

    psu create -protocol xrootd/*

PSU - Pools and pool group
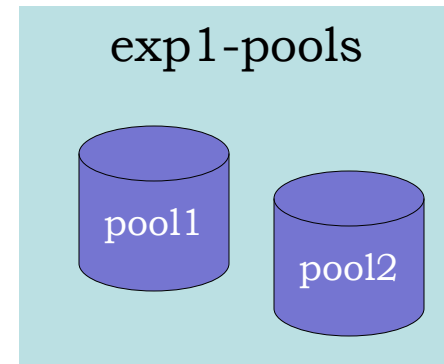
Pool is also a "unit" for PSU but with a bit different syntax.

psu create pool pool1

psu create pool pool2

Pool s can be grouped together to pool groups

psu create pgroup epx1-pools

psu addto pgroup exp1-pools pool1

psu addto pgroup exp1-pools pool2

exp1-pools

pool1

pool2

PSU – unit group

The units store , net, protocol must be grouped (also if group contains one unit only).

Protocol Unit Groups:

      psu create ugroup any-protocol
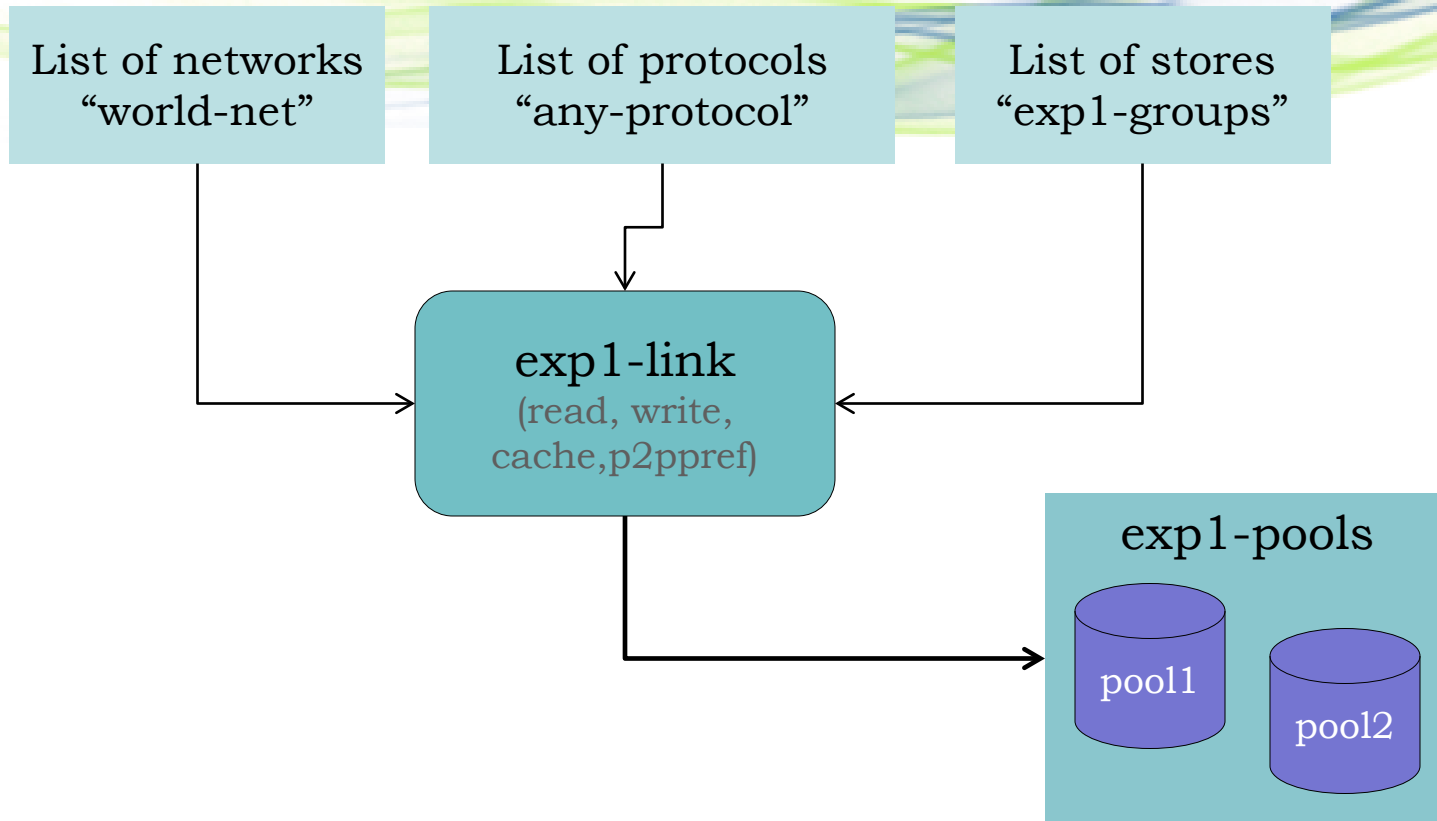
      psu addto ugroup any-protocol */*

Sub (Network) Unit Groups

      psu create ugroup worldnet

      psu addto ugroup worldnet 0.0.0.0/0.0.0.0

Storage Unit Groups

      psu create ugroup any-store

      psu addto ugroup any-store *@*

      psu create ugroup exp1-groups

      psu addto ugroup exp1-groups exp1:GENERATED@osm

      psu addto ugroup exp1-groups exp1:STATIC@osm

PSU links

List of networks "world-net"

List of protocols "any-protocol"

List of stores "exp1-groups"

exp1-link
(read, write, cache,p2ppref)

exp1-pools

pool1

pool2

psu create link exp1-link world-net any-protocol exp1-groups
psu set link link exp1-link -readpref=10 –writepref=10 –cachepref=10 –p2ppref=-1
psu add link exp1-link exp1-pools

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Tags in dCache

Each directory of the namespace has a set of tags. These tags may be used to control which pools are used for storing the files in the directory

- Listing tags in the directory:

the storage class tags foo:BAR@osm

```
# cat '.(tag)(sGroup)'
                StoreName foo
# cat '.(tag)(OSMTemplate)'
                BAR
```

Tags are inherited by sub-directories at creation : Changing a tag of a directory will change the tag of each sub-directory.
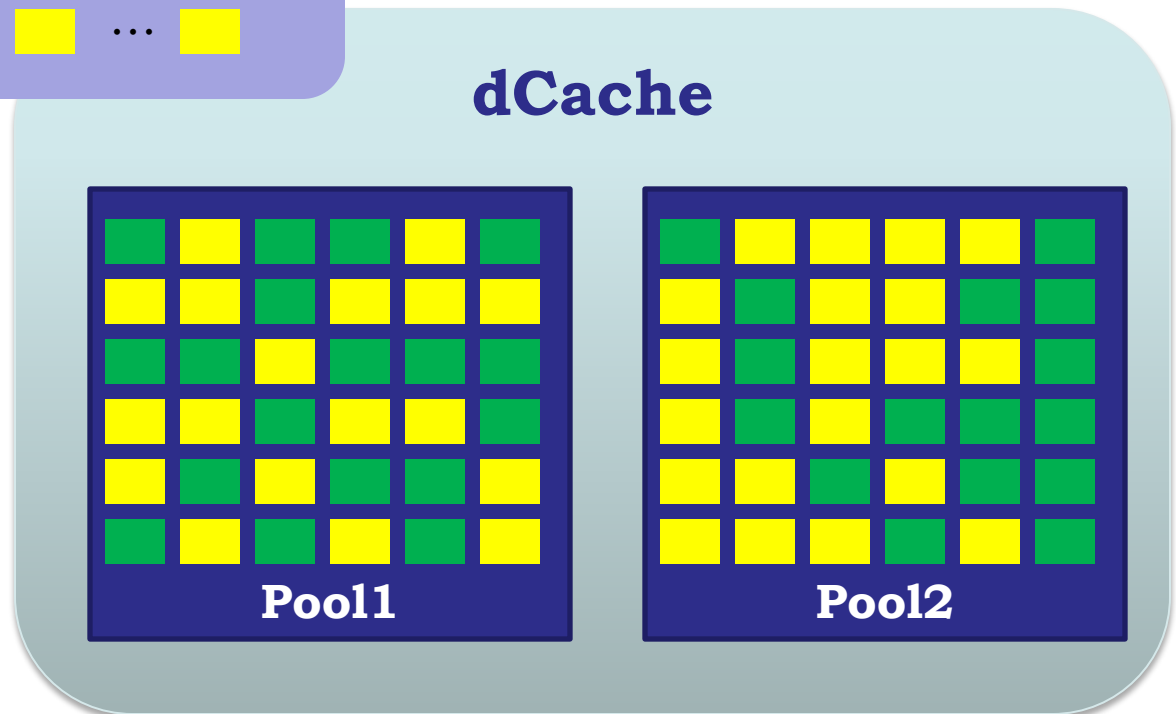
Default configuration:

- Anyone can write/read anywhere

/pnfs/dcache.org/

exp1/

exp2/

namespase

dCache

Pool1

Pool2

perfect for a small instance if "exp1" and "exp2" use a common budget

Assign pool to a directory
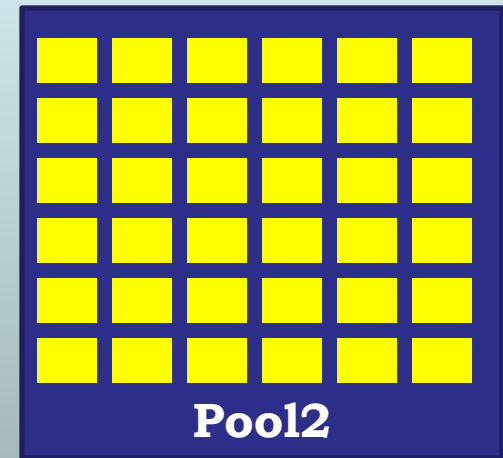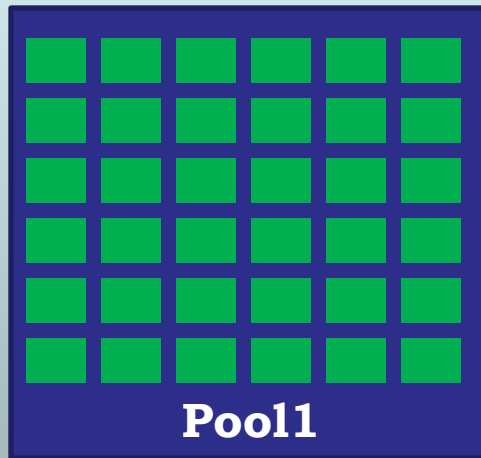
- ## Separate data on the pool.

/pnfs/dcache.org/

namespase

exp1/

exp2/

Now pool1 belongs only to exp1, and pool2 to the exp2.

dCache

Pool1

Pool2

Assign pool to a directory

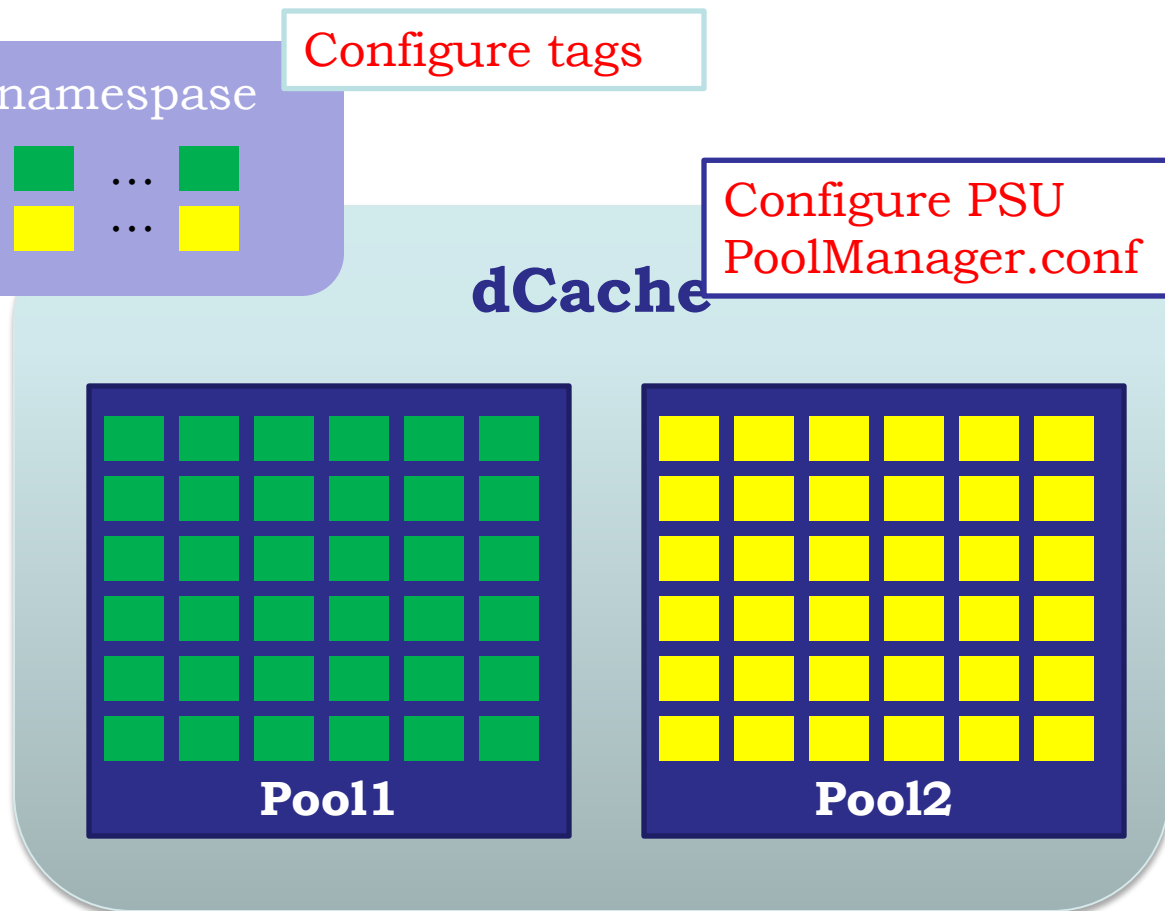- ## Separate data on the pool.

/pnfs/dcache.org/

exp1/

exp2/

namespase

Configure tags

Configure PSU
PoolManager.conf

dCache

Now pool1 belongs
only to exp1, and
pool2 to the exp2.

PSU = Pool Selection
Unit

Pool1

Pool2

Time for practice

Hands on:

https://wiki.scc.kit.edu/gridkaschool/index.php/Pool_Management_And_Pool_Selection_(2012)