Pool Management and Pool selection

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Outline:

- How dCache stores 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
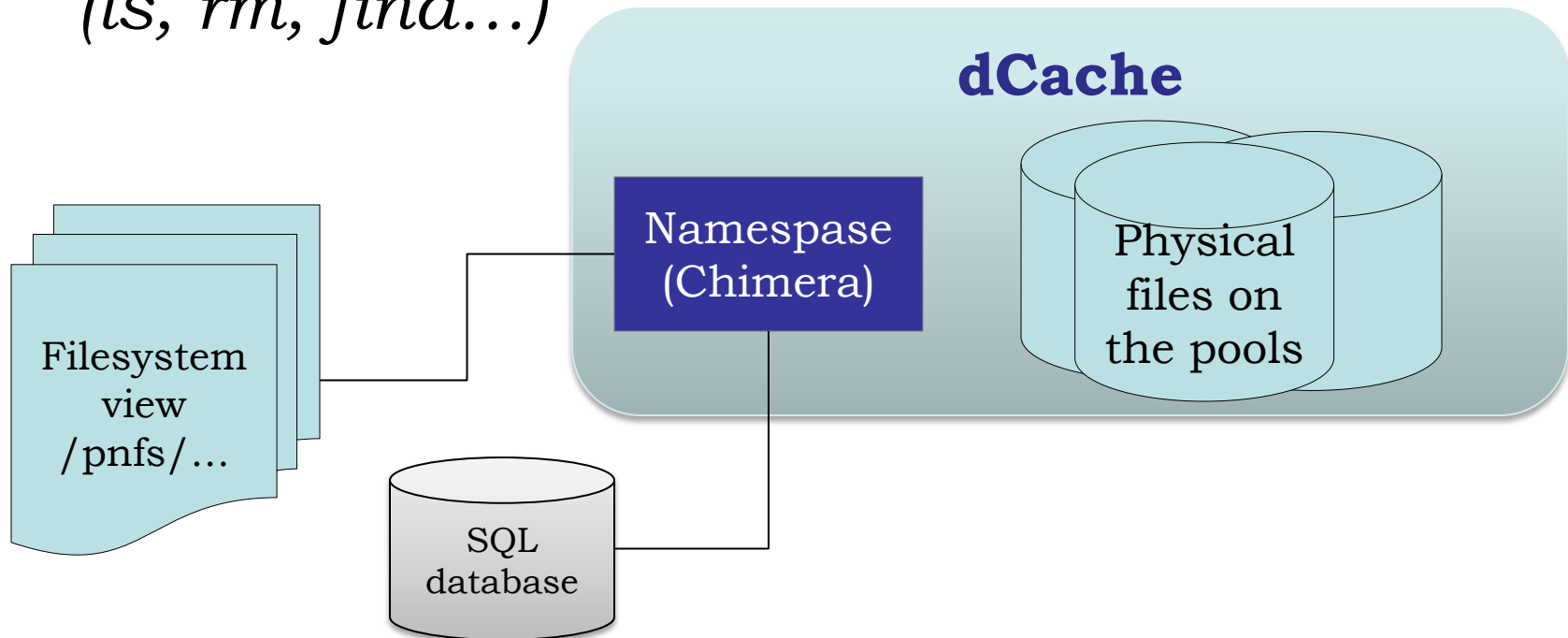 Selecting pools based on storage class

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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

Pool Manager the heart of dCache

PoolManager

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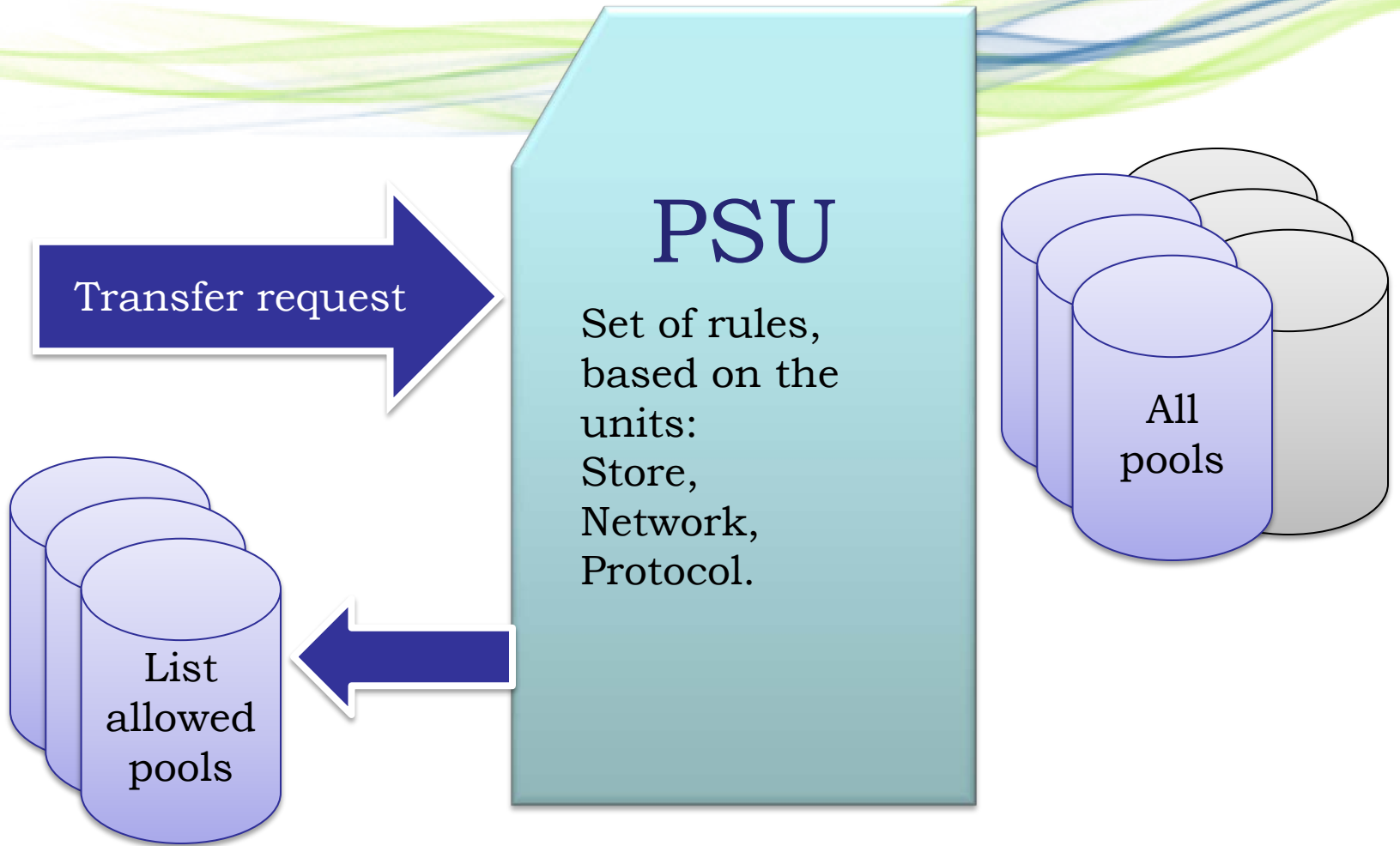- handle each file transfer request
- Decide on which pool will be used on the user's request
- Highly configurable sub-module structure
  - Sub-module PSU(Pool Selection Unit)
- Configuration file poolmanager.conf

PSU

Transfer request →

PSU

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

All pools

List allowed pools

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PSU – units

unit -store *Define location names on the system where the data will be 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
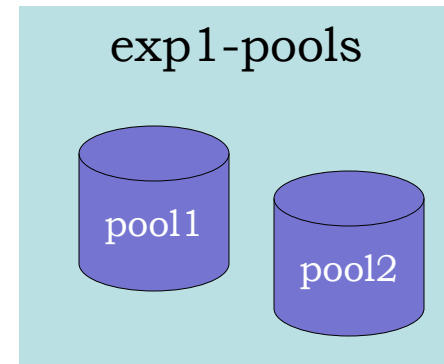
Pool is also a "unit" for PSU but with a bit different syntax.

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

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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
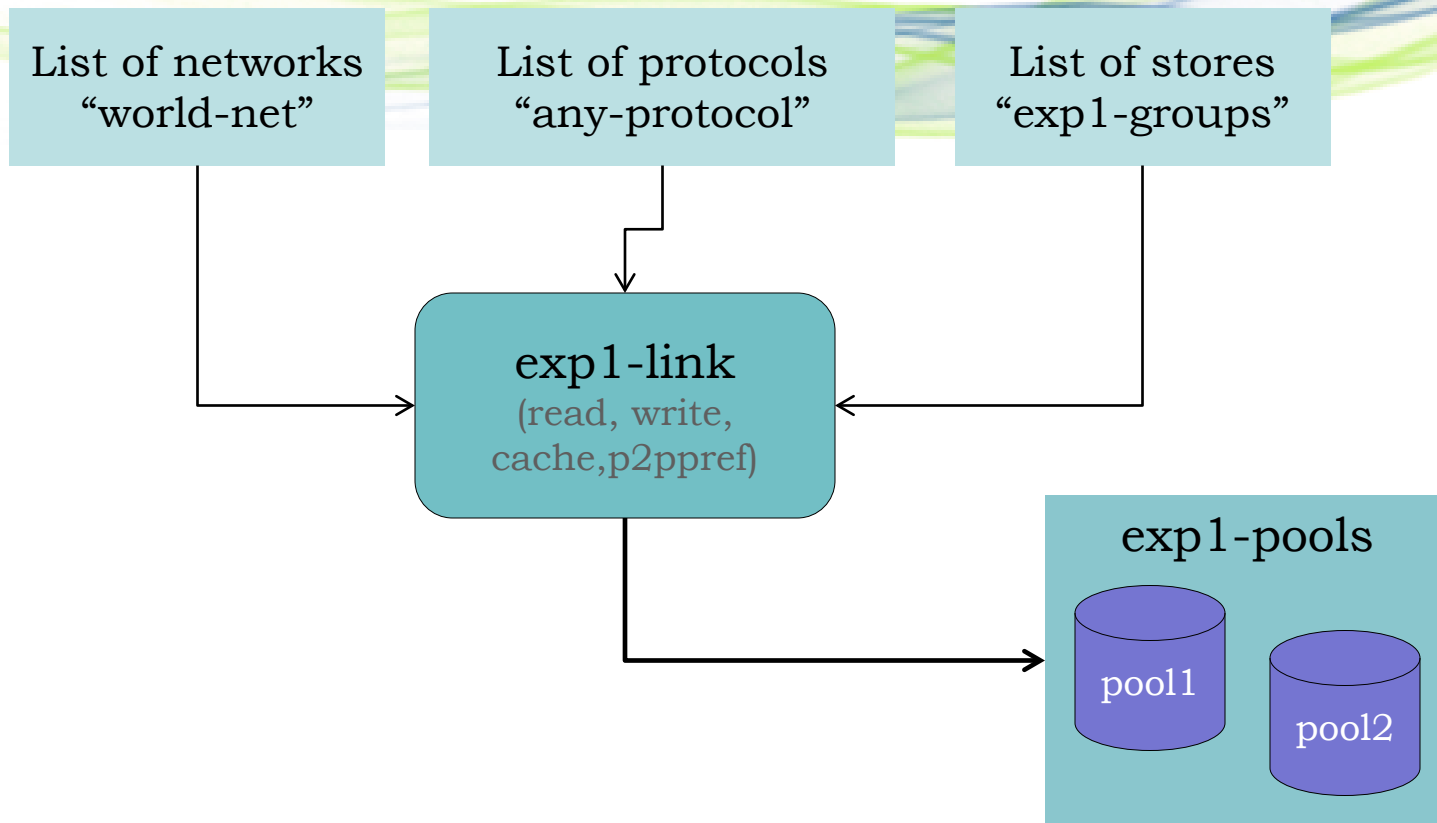
     psu addto ugroup any-protocol */*

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
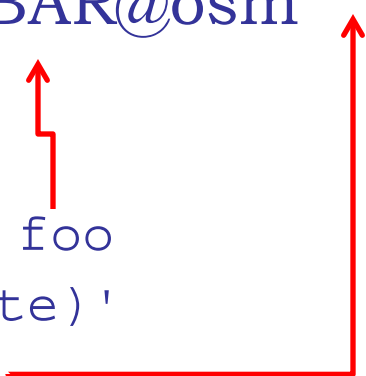psu add link exp1-link exp1-pools

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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.
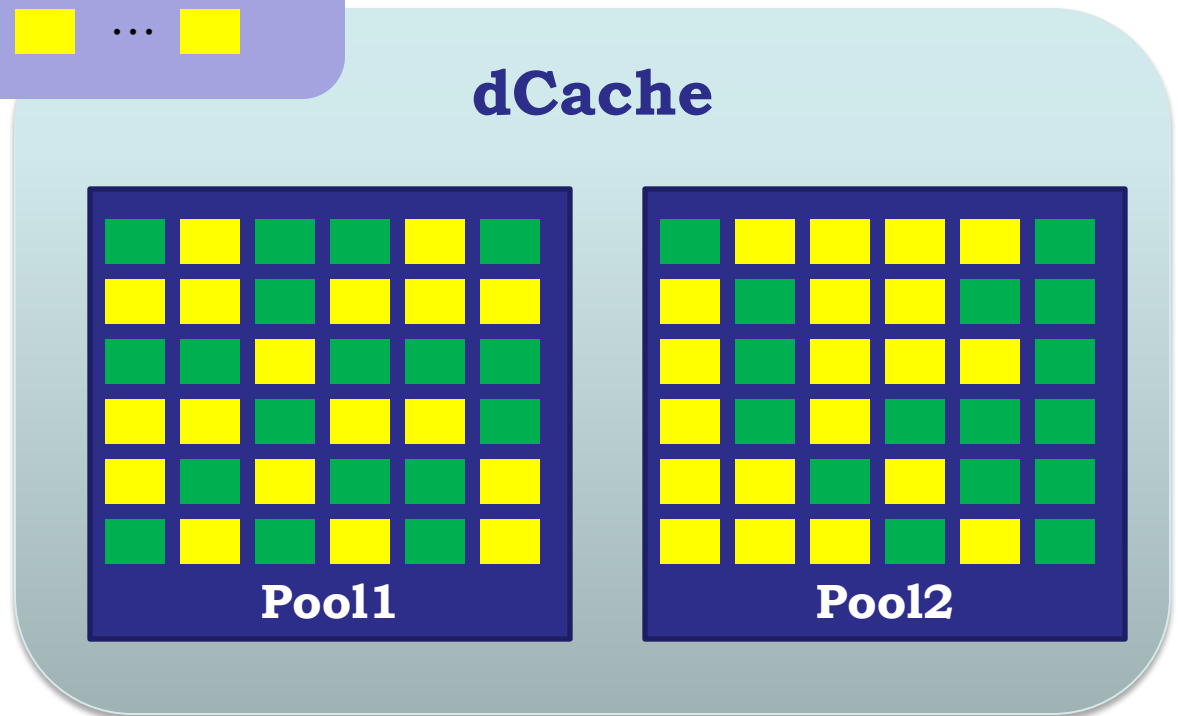
Default configuration:

- Anyone can write/read anywhere

/pnfs/dcache.org/

exp1/ ▢▢ … ▢

exp2/ ▢▢ … ▢

namespase

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

dCache

Pool1

Pool2

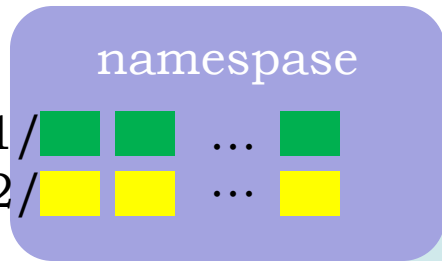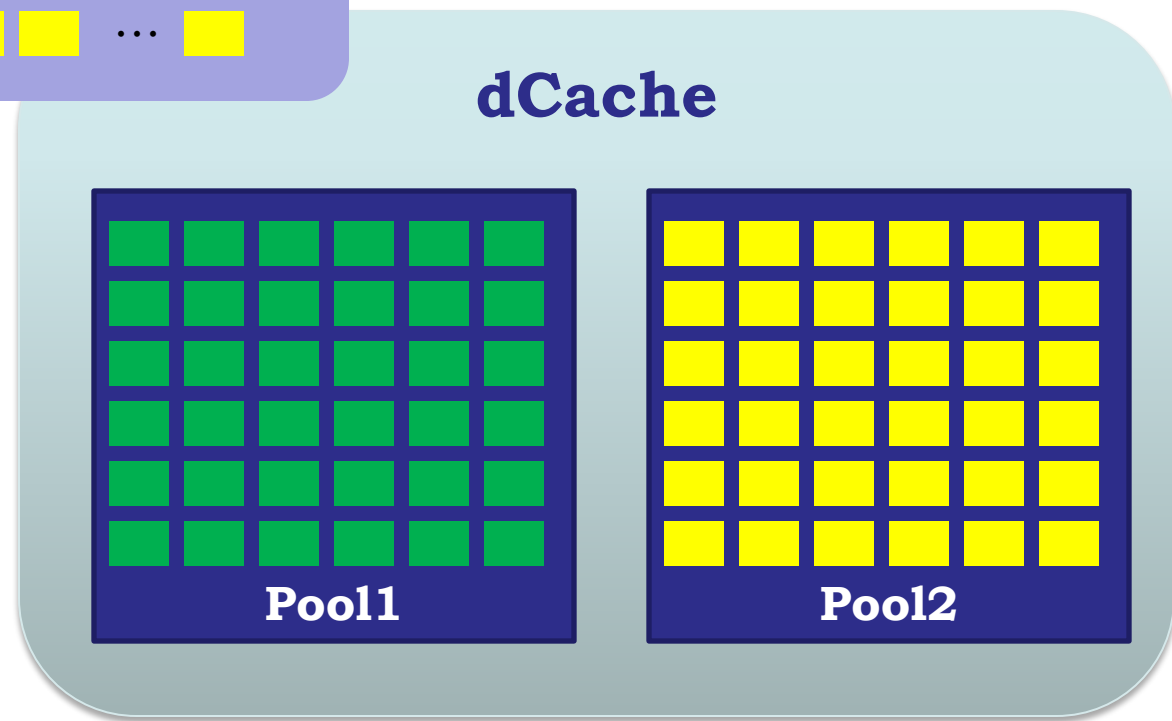# Assign pool to a directory

- ## Separate data on the pool.

/pnfs/dcache.org/

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

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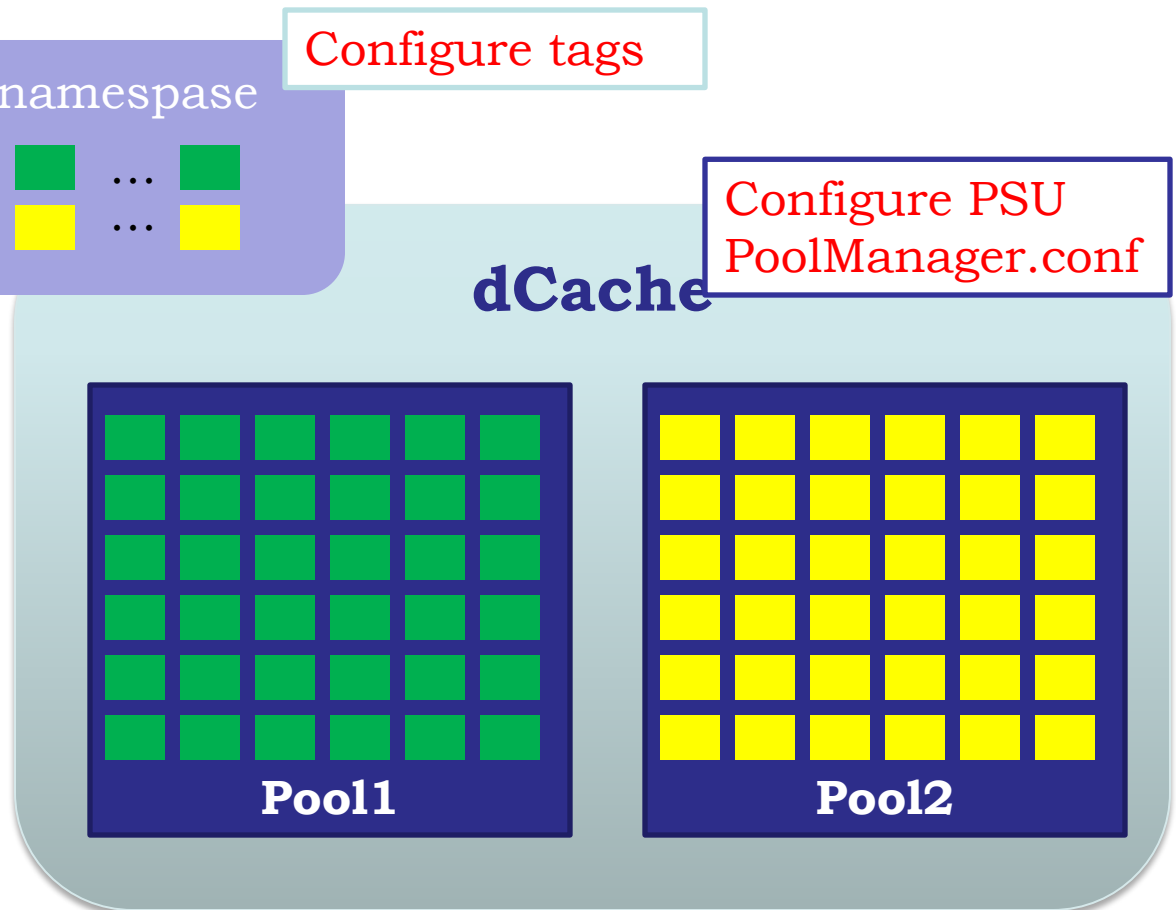
- ## Separate data on the pool.

/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

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Time for practice

Hands on:

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