



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

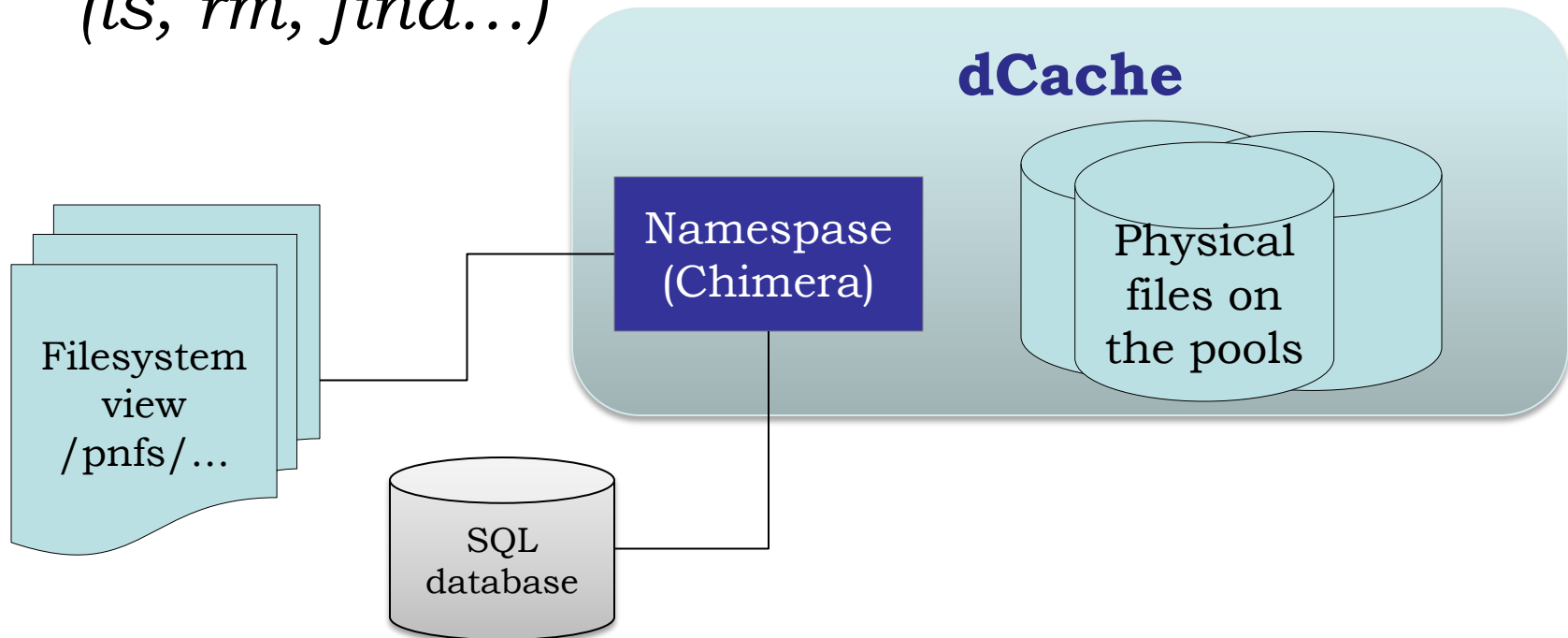
Getting in touch with the namespace



First look at namespace:

Mount point: /pnfs (traditionally)

*Getting information with standard commands
(ls, rm, find...)*



Pool Manager the heart of dCache



PoolManager

unique service of dCache domain

handle each file transfer request

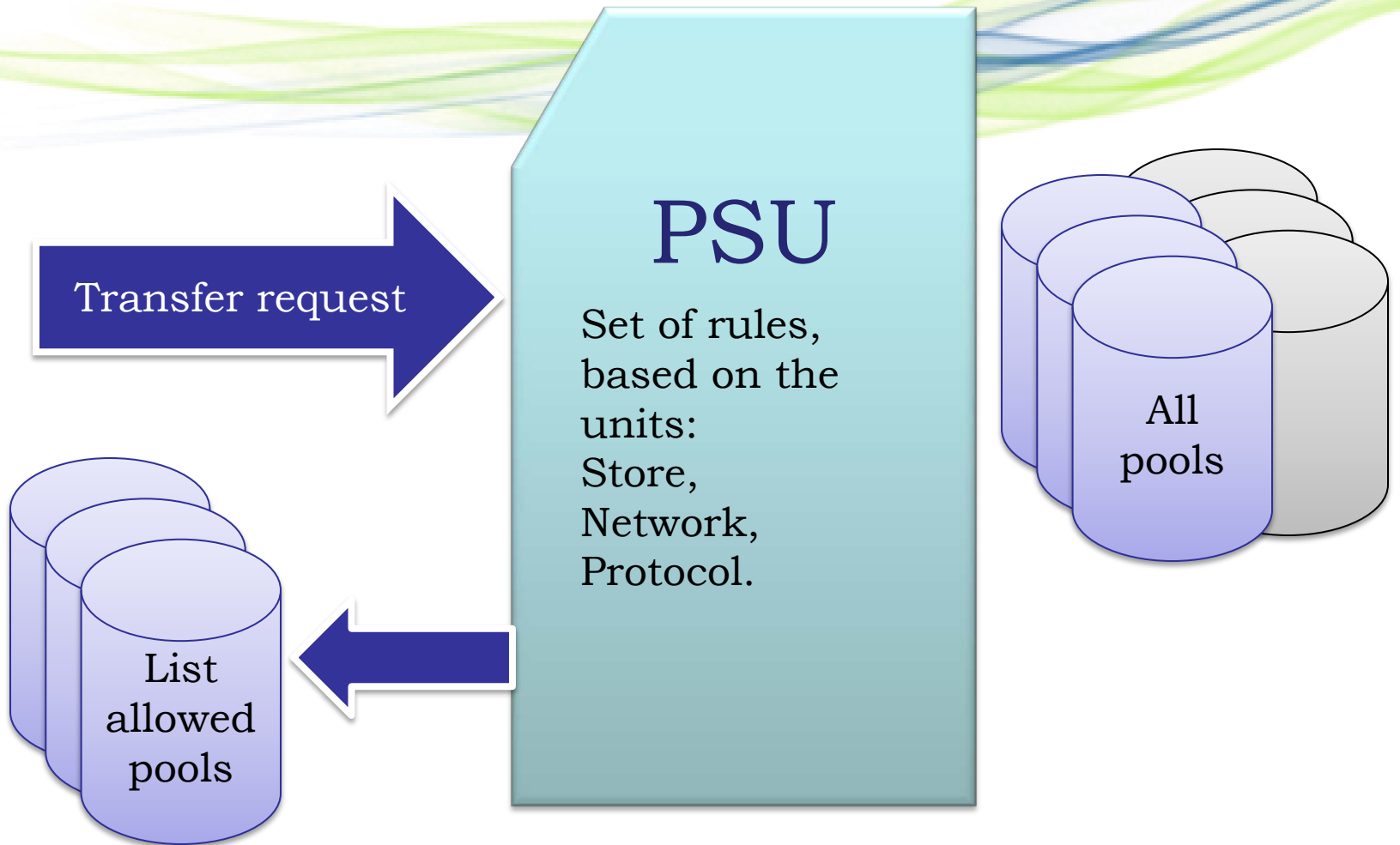
Decide on which pool will be used on the user's request

Highly configurable sub-module structure

- Sub-module PSU(Pool Selection Unit)

Configuration file `poolmanager.conf`

PSU



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

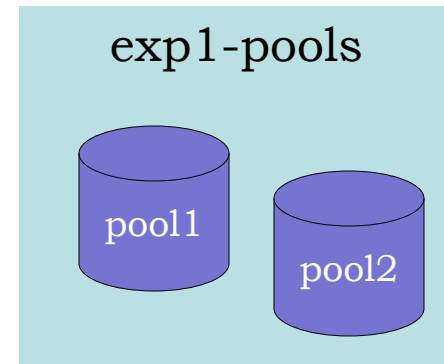


Pool is also a “unit” for PSU but with a bit different syntax.

```
psu create pool pool1  
psu create pool pool2
```

Pools can be grouped together to pool groups

```
psu create pgroup exp1-pools  
psu addto pgroup exp1-pools pool1  
psu addto pgroup exp1-pools 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 */*
```

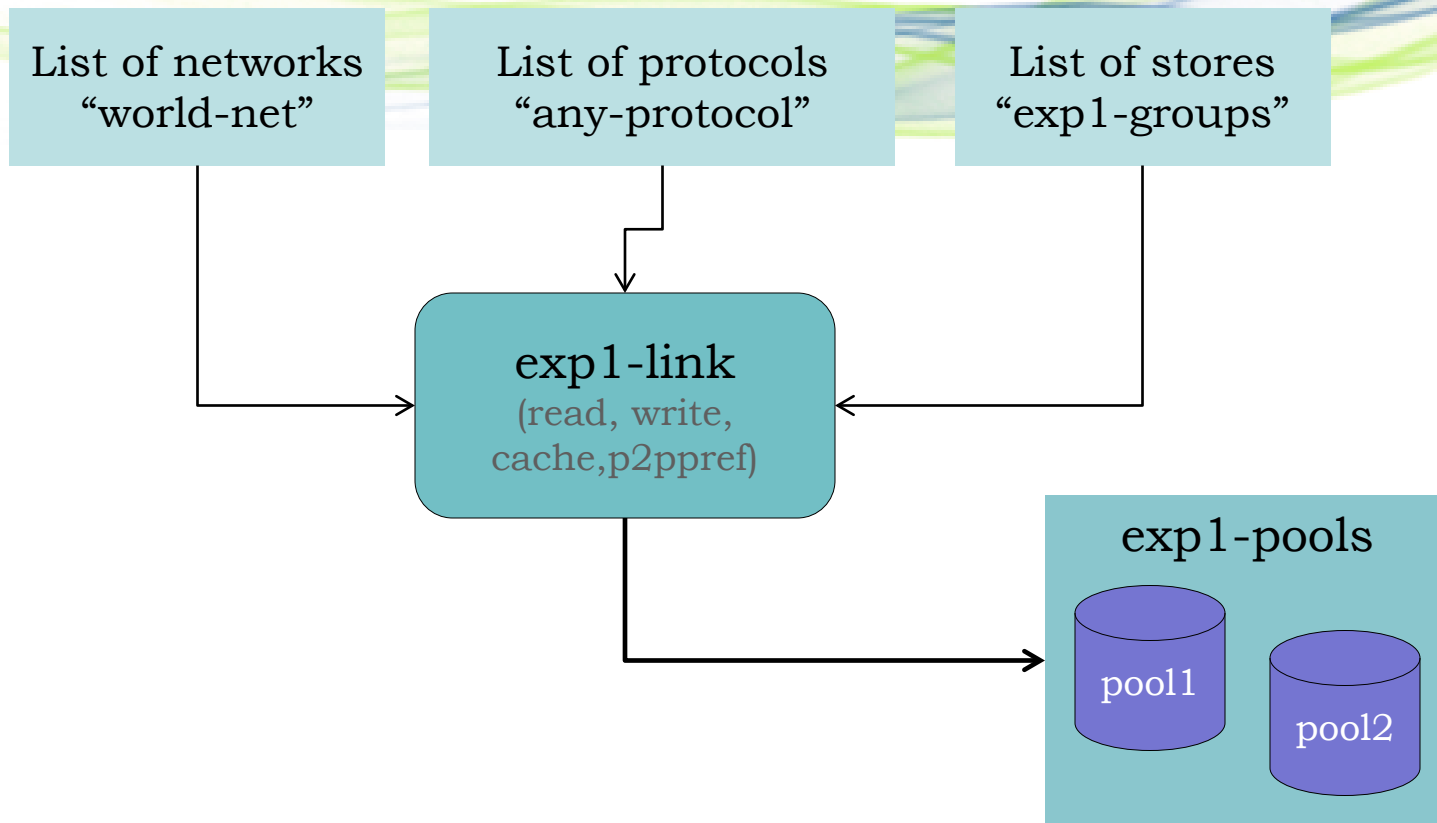
Sub (Network) Unit Groups

```
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



```
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
```

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:

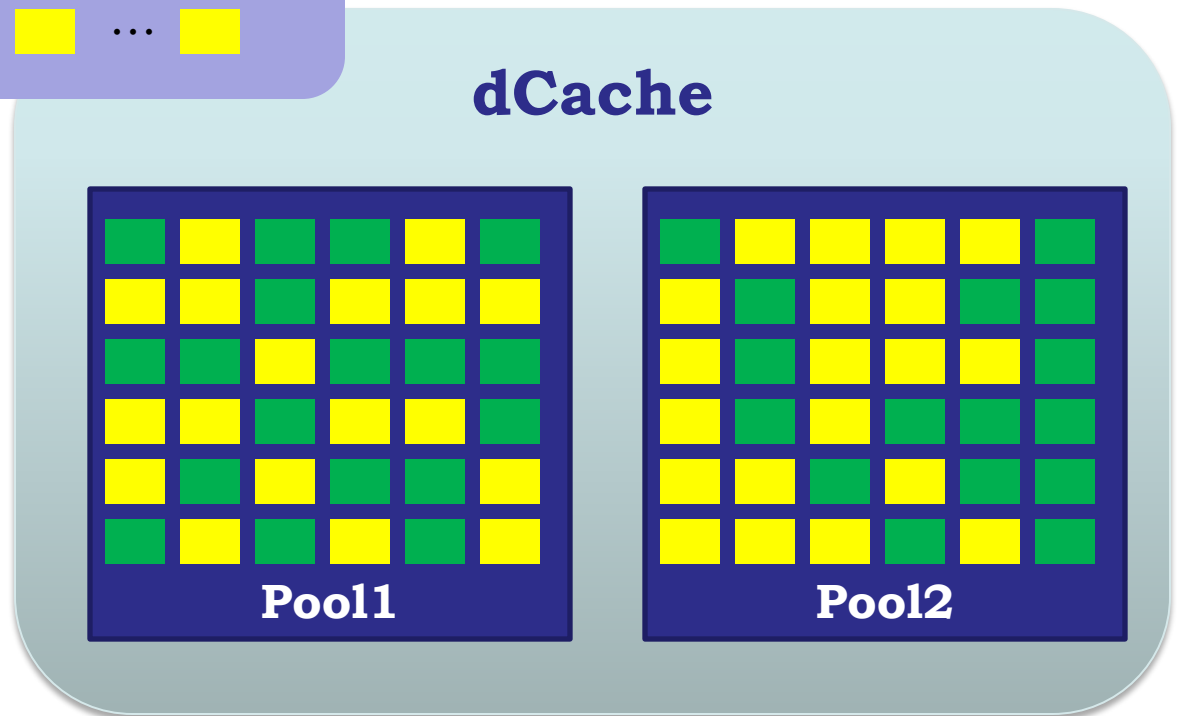


- Anyone can write/read anywhere

/pnfs/dcache.org/

namespace
exp1/ [green] [green] ... [green]
exp2/ [yellow] [yellow] ... [yellow]

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



Assign pool to a directory

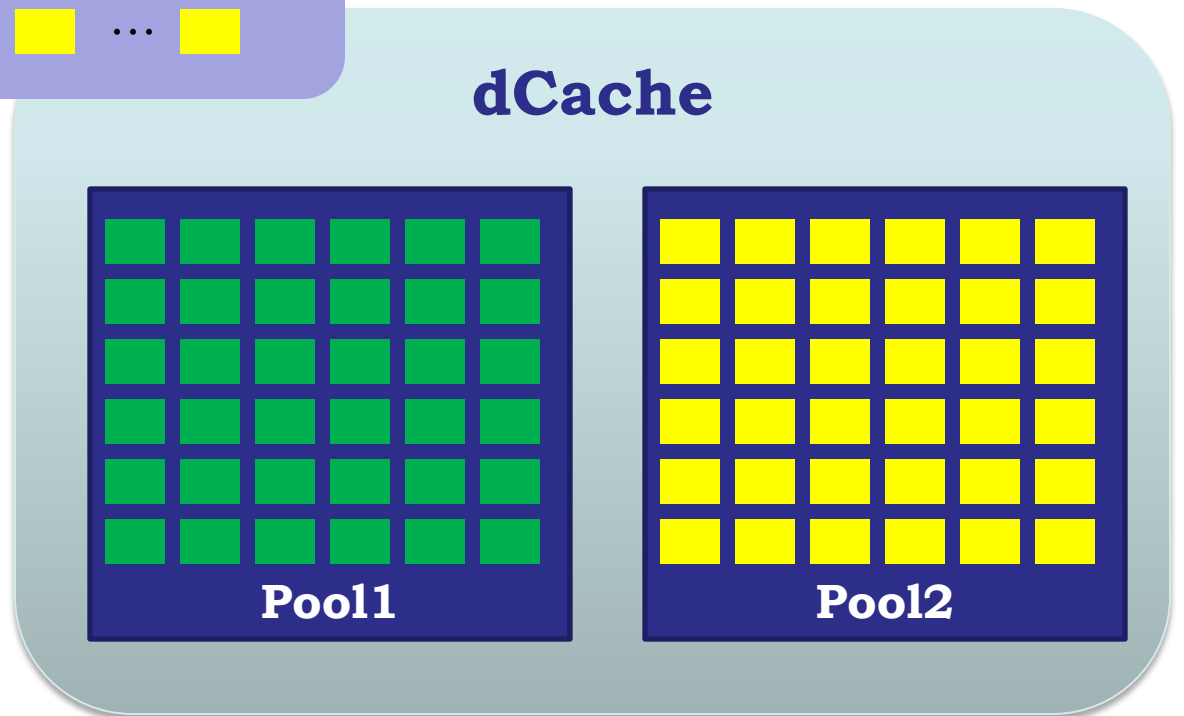


- Separate data on the pool.

/pnfs/dcache.org/

namespace
exp1/ [green] [green] ... [green]
exp2/ [yellow] [yellow] ... [yellow]

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



Assign pool to a directory



- Separate data on the pool.

/pnfs/dcache.org/

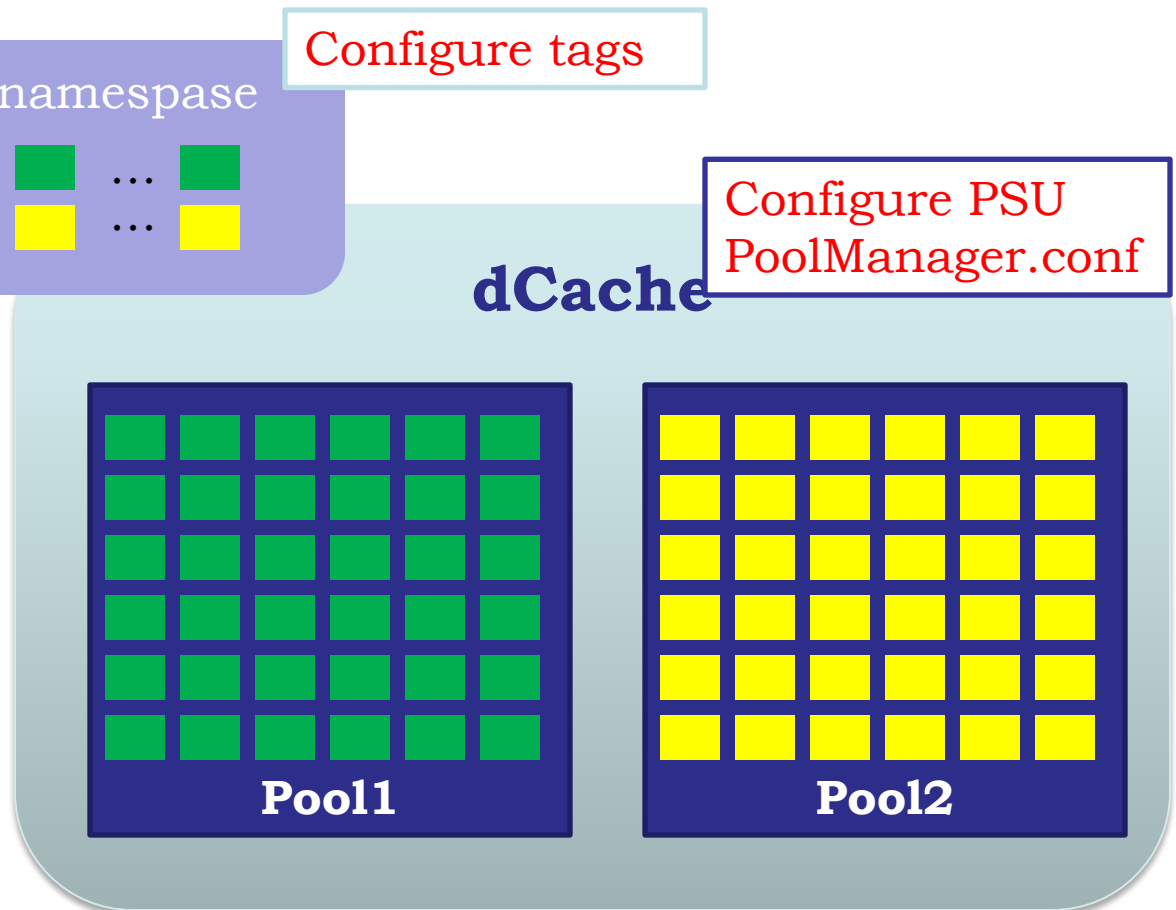
namespace
exp1/ [green] [green] ... [green]
exp2/ [yellow] [yellow] ... [yellow]

Configure tags

Configure PSU
PoolManager.conf

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

PSU = Pool Selection Unit



Time for practice



Hands on:

[https://wiki.scc.kit.edu/gridkaschool/index.php/Pool_Management
And_Pool_Selection_\(2012\)](https://wiki.scc.kit.edu/gridkaschool/index.php/Pool_Management_And_Pool_Selection_(2012))