



# 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

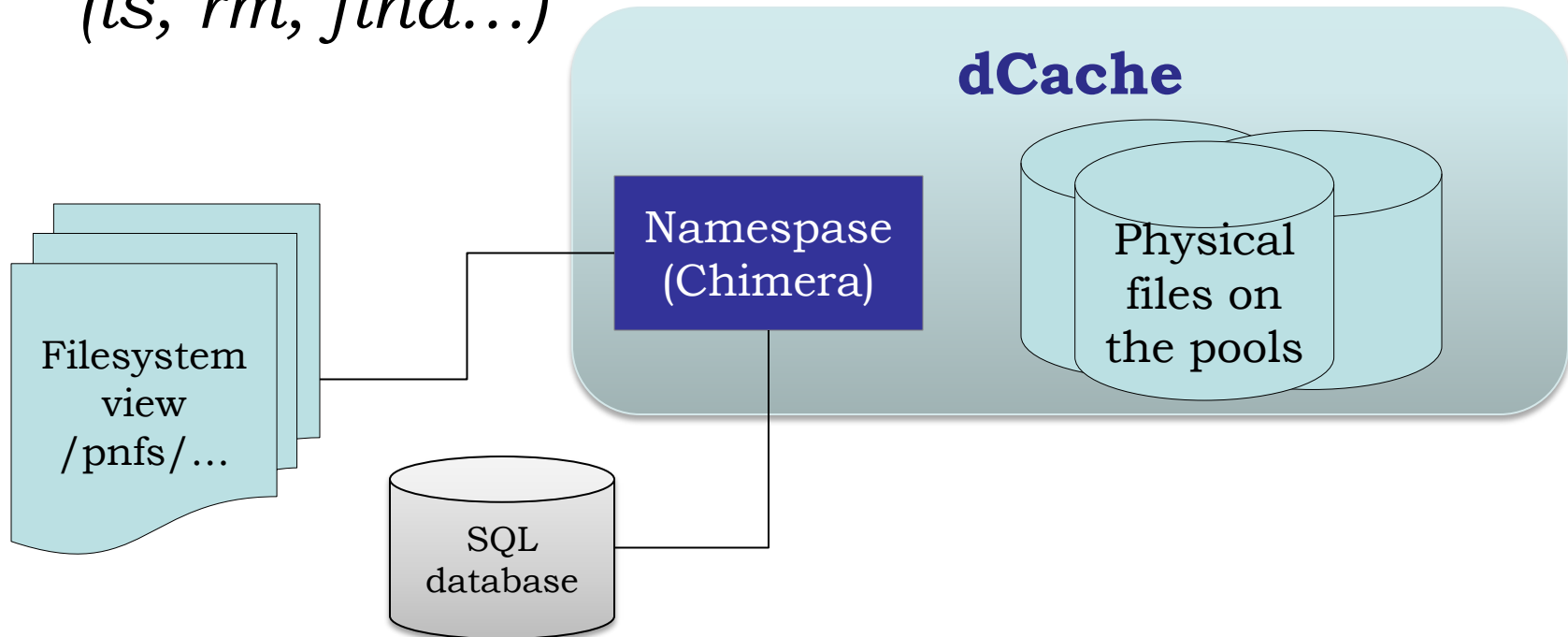
# Getting in touch with the namespace



*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

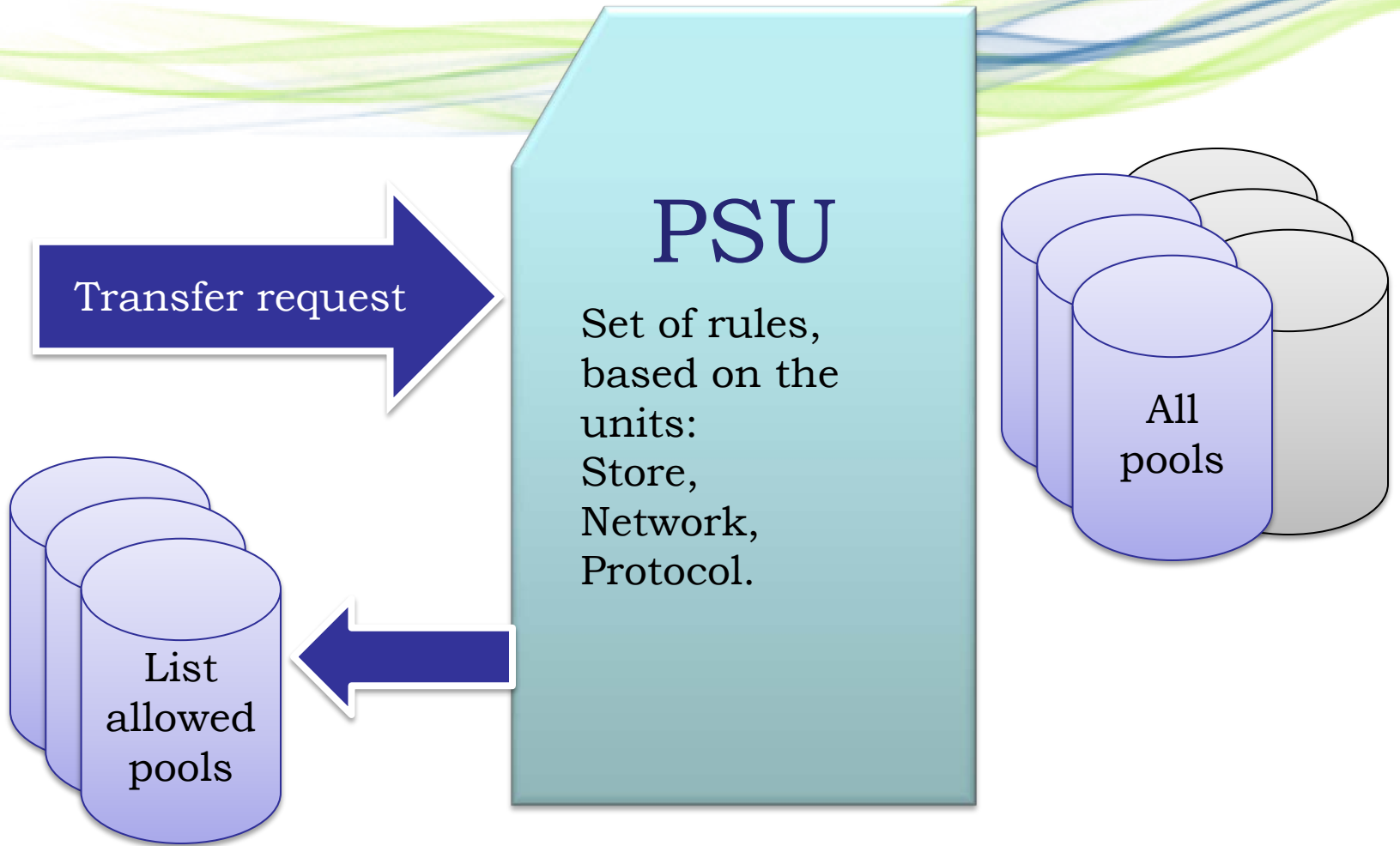
Highly configurable sub-module structure

- Sub-module PSU(Pool Selection Unit)

Configuration file `poolmanager.conf`

*`/var/lib/dcache/config/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

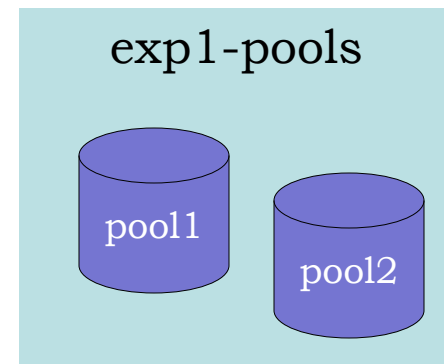


*Pool is also a “unit” for PSU but with a bit different syntax.*

```
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*

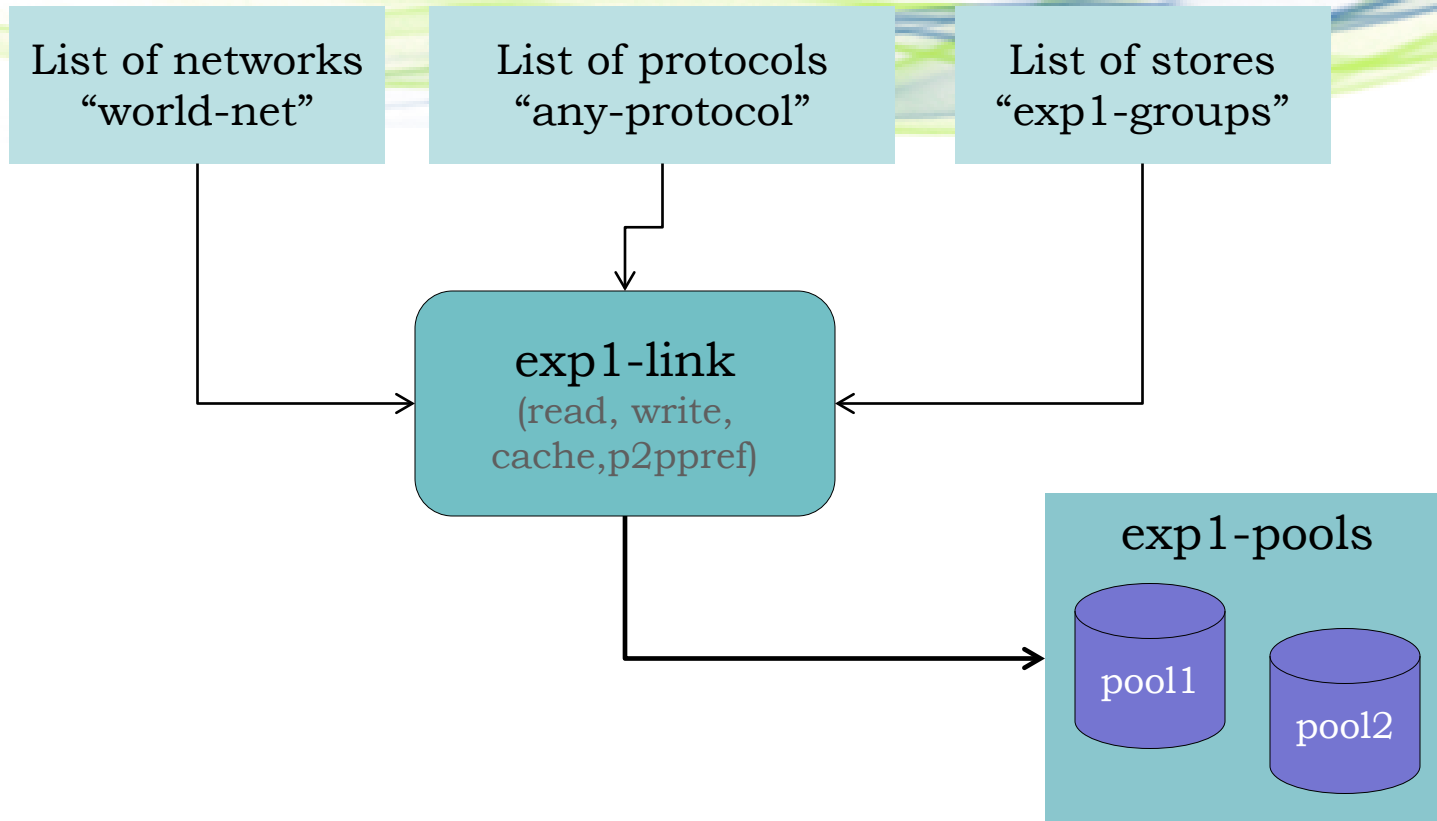
```
psu create ugroup worldnet
psu addto ugroup worldnet 0.0.0.0/0.0.0.0
```

## *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

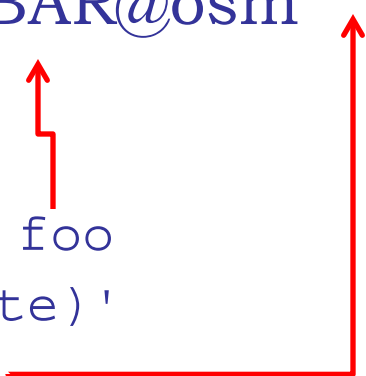


Each directory of the namespace has a set of tags. These tags may be used to control which pools are used for storing the files in the directory

- Listing tags in the directory:

the storage class tags foo:BAR@osm

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



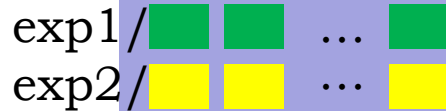
*Tags are inherited by sub-directories at creation : Changing a tag of a directory will change the tag of each sub-directory.*

# Default configuration:

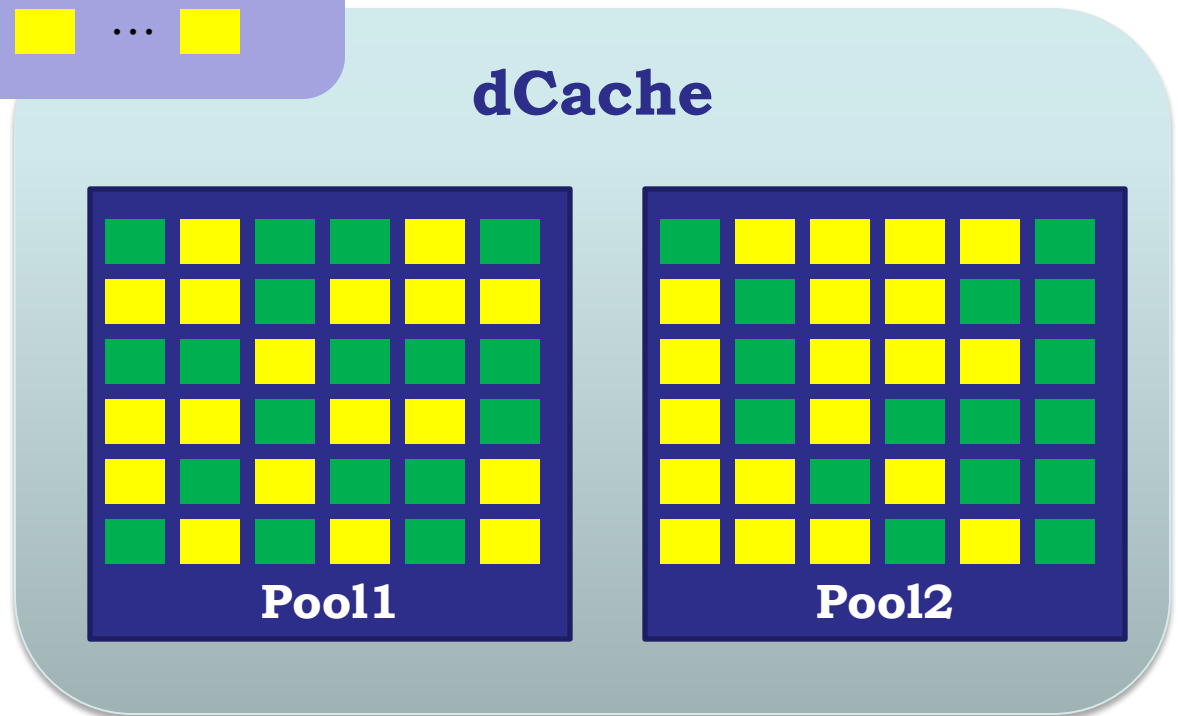


- Anyone can write/read anywhere

/pnfs/dcache.org/



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



# Assign pool to a directory

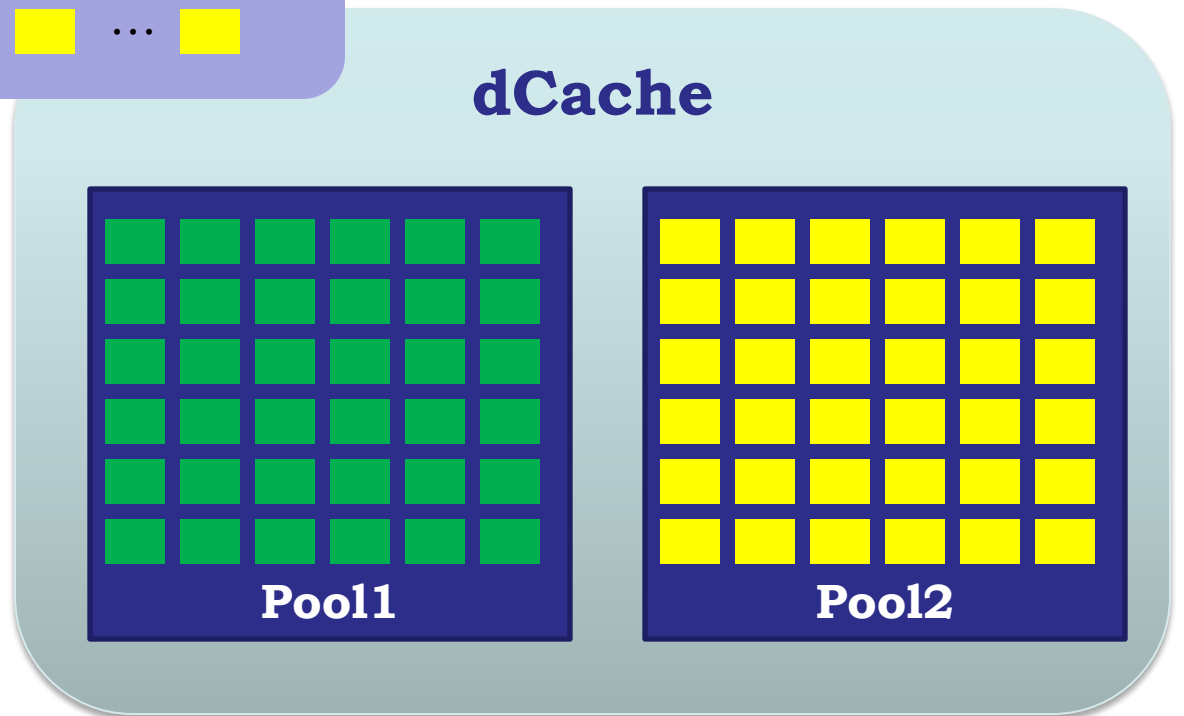


- Separate data on the pool.

/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/

exp1/ 

exp2/ 

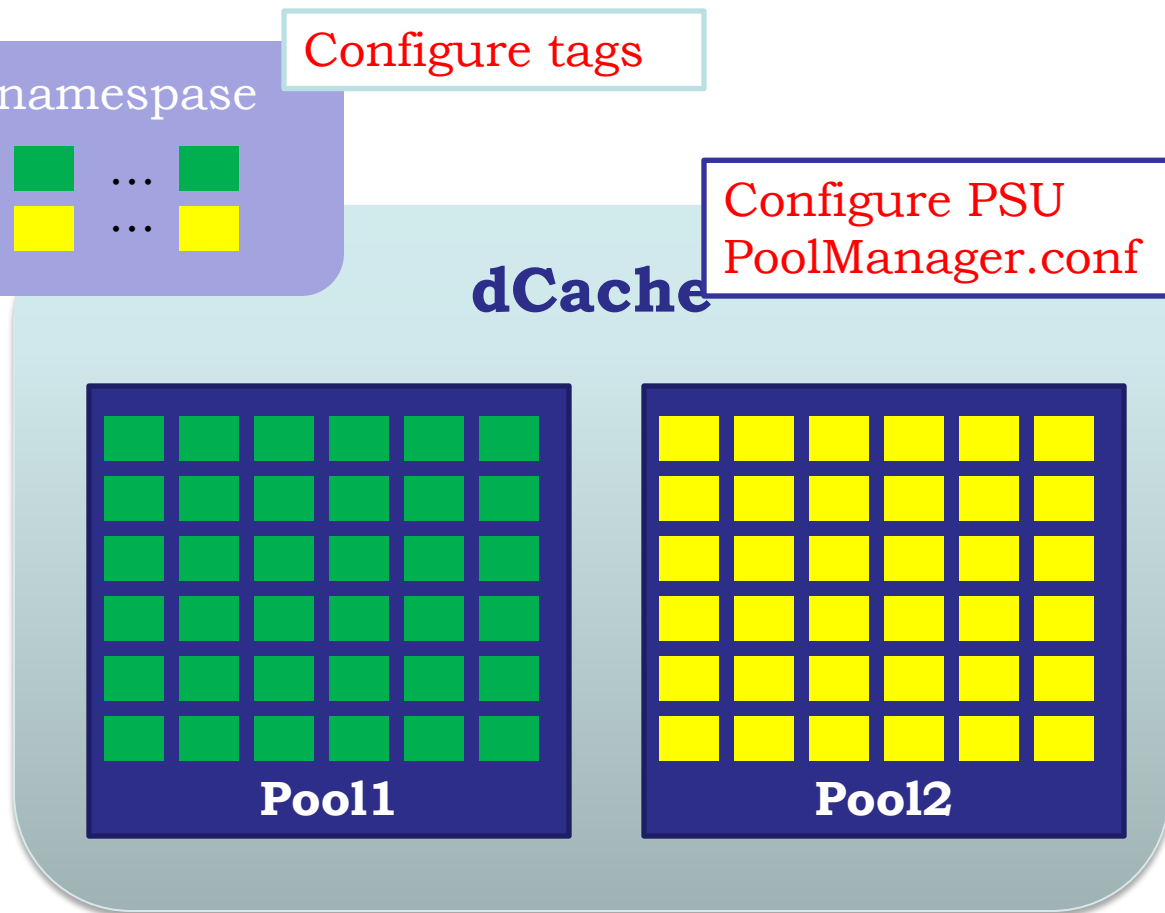
namespace

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))