

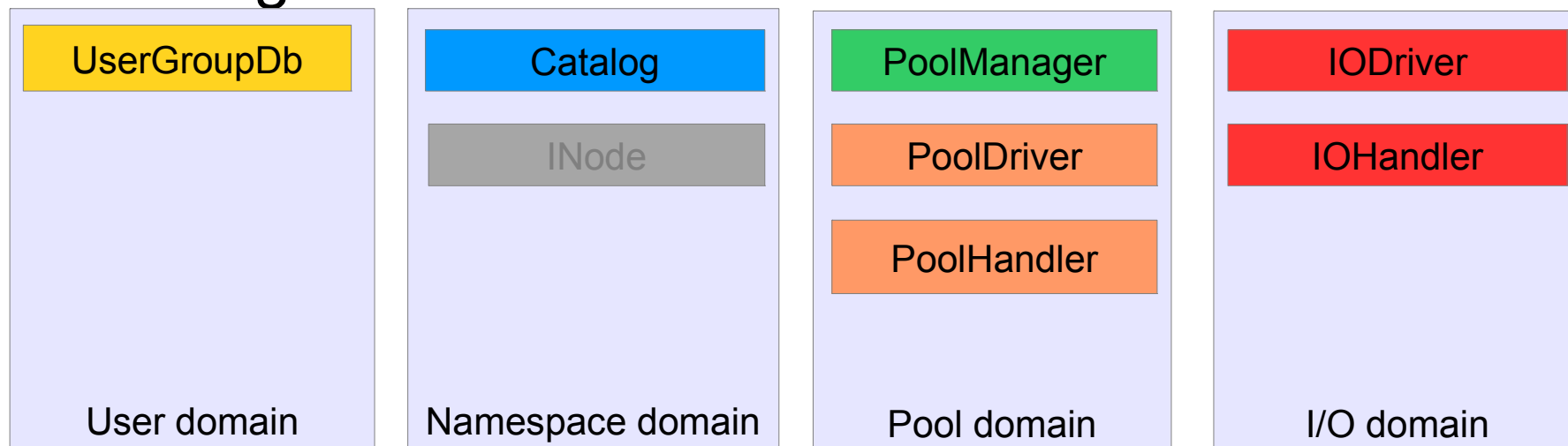
# Plugins and Filesystem Integration

Alejandro Álvarez Ayllón  
*on behalf of the LCGM development team*

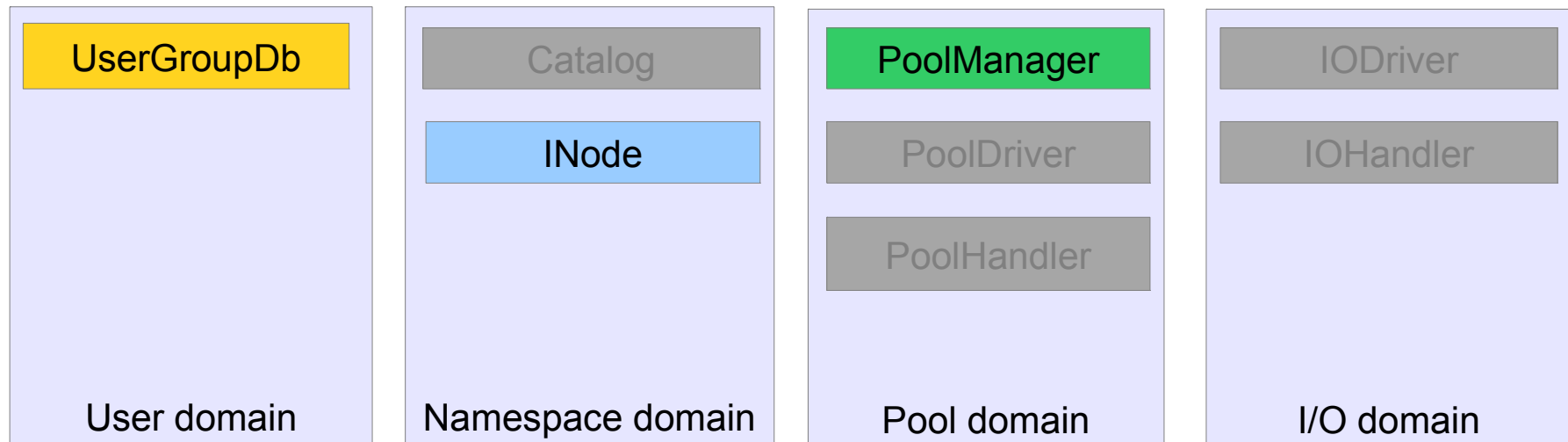


- ▶ Existing plug-ins
  - ▶ Native, MySQL, Oracle, Memcache
  - ▶ HDFS, S3
  - ▶ VFS
- ▶ Filesystem integration

- ▶ Interacts directly with the DPNS/DPM/LFC daemons
  - ▶ Simply redirects calls using the existing API
- ▶ Full backward compatibility
  - ▶ Both for namespace and pool/filesystem management

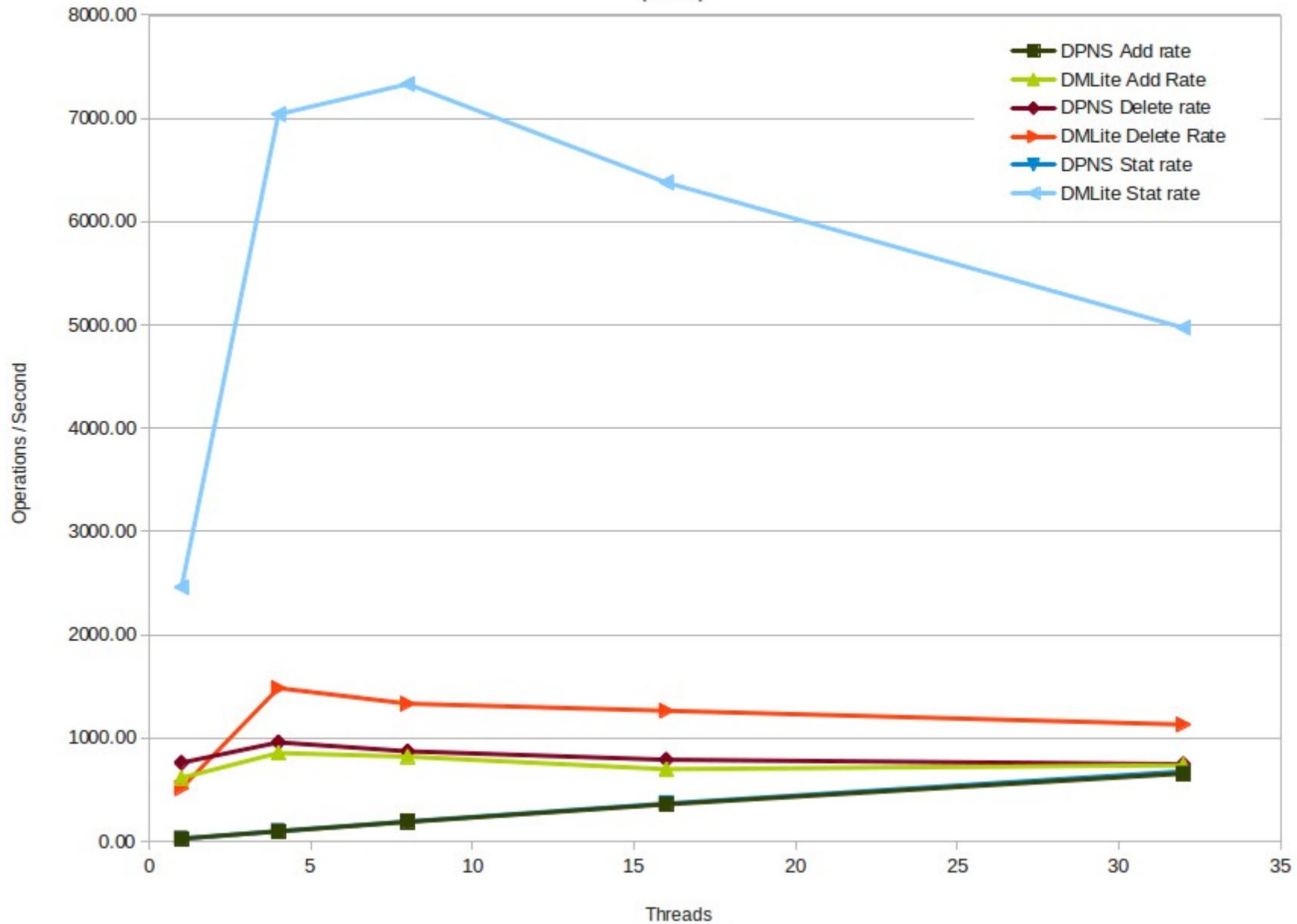


- ▶ Refactoring of the MySQL backend
  - ▶ Properly using bind variables and connection pooling
  - ▶ Huge performance improvements
- ▶ Namespace traversal comes from Built-in *Catalog*



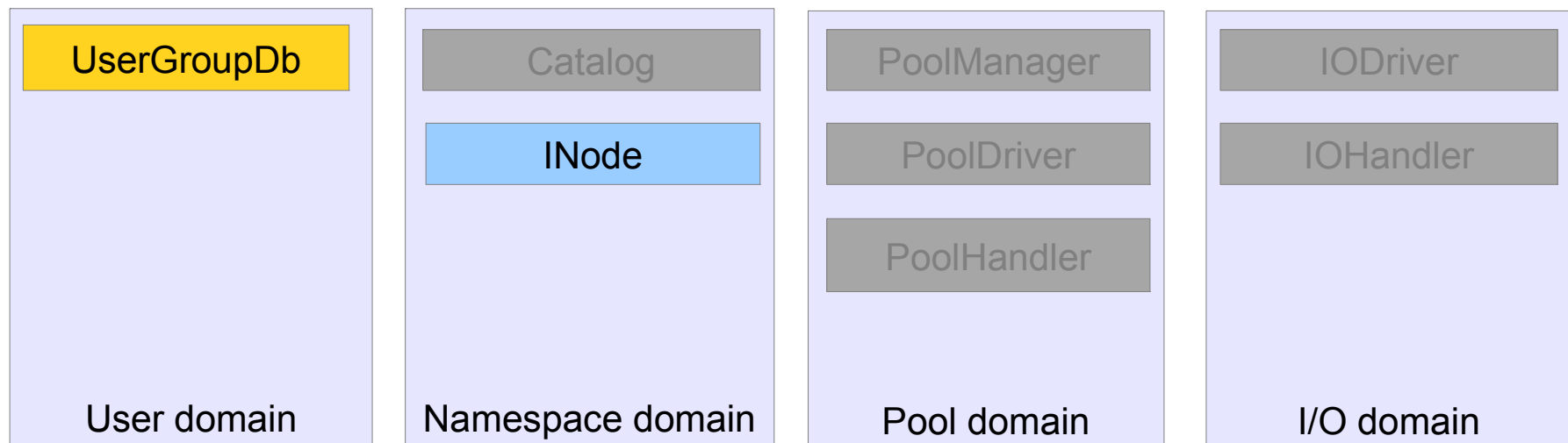
# Plugins: MySQL

DMLite vs DPNS  
(Local)



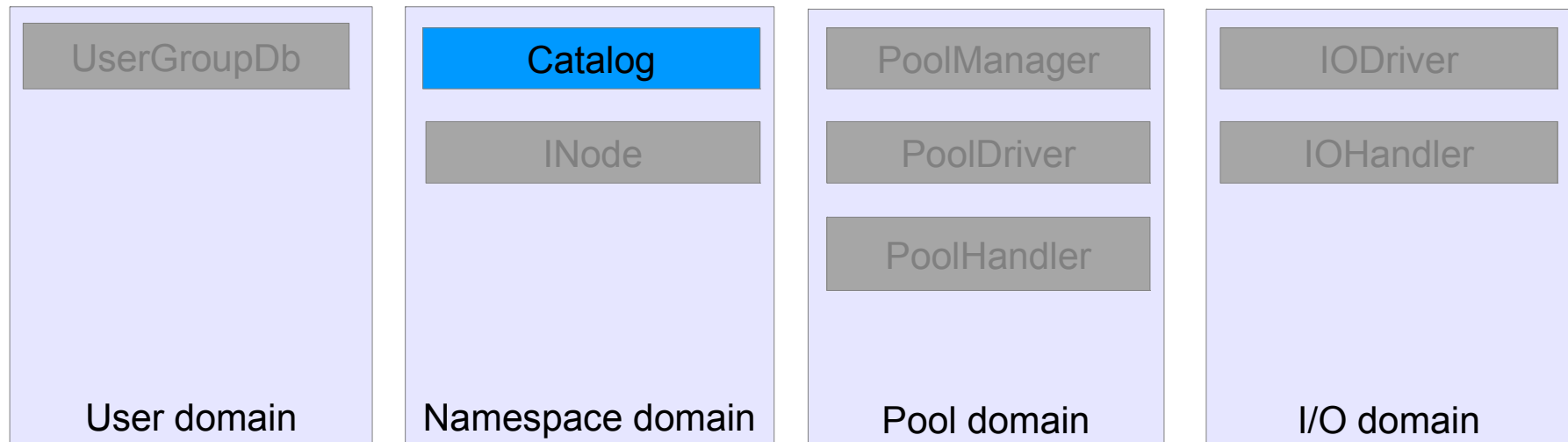
# Plugins: Oracle

- ▶ Refactoring of the Oracle backend
- ▶ What applies to the MySQL one, applies here
  - ▶ Better performance with bind variables and pooling
  - ▶ Namespace traversal comes from Built-in *Catalog*

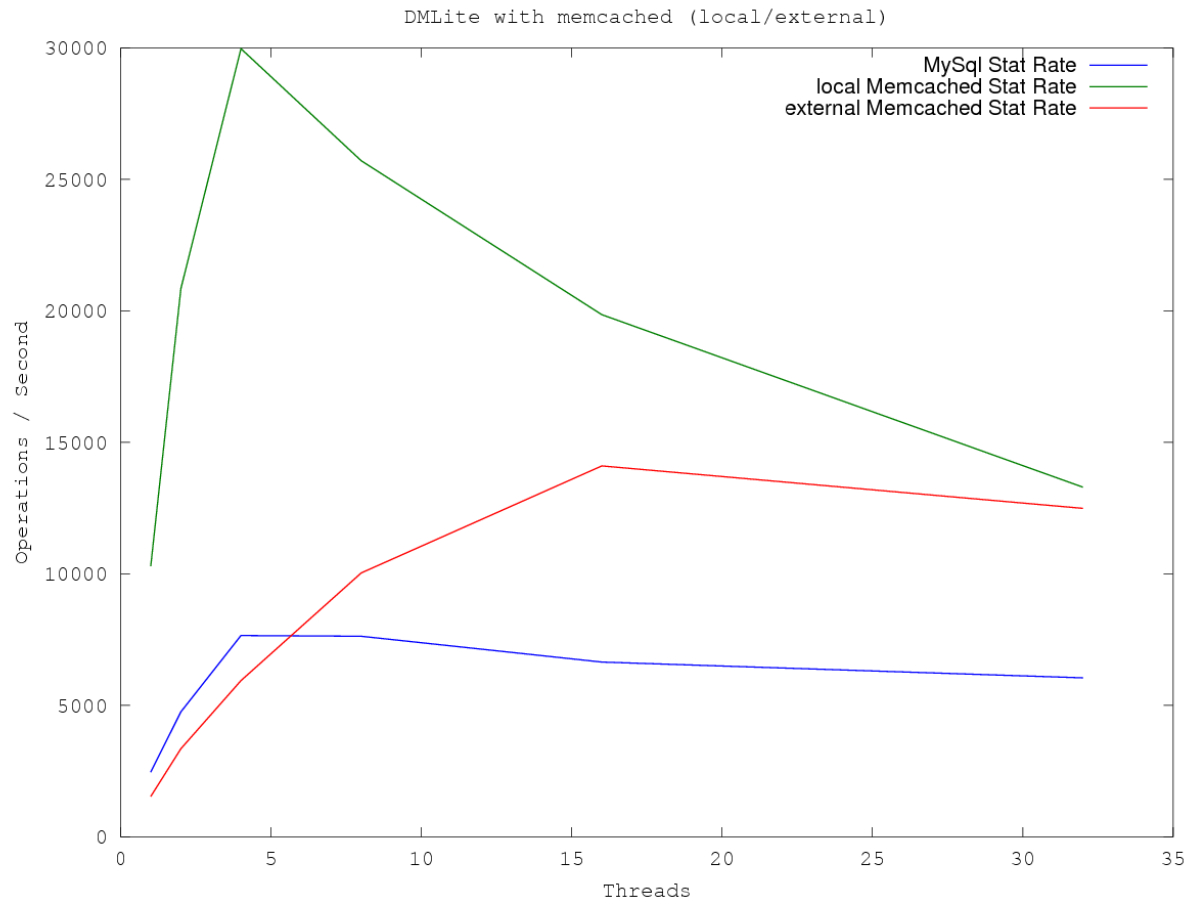


# Plugins: Memcache

- ▶ Memory cache for namespace requests
  - ▶ Reduced load on the database
  - ▶ Much improved response times
  - ▶ Horizontal scalability
- ▶ Can be put over **any other *Catalog*** implementation



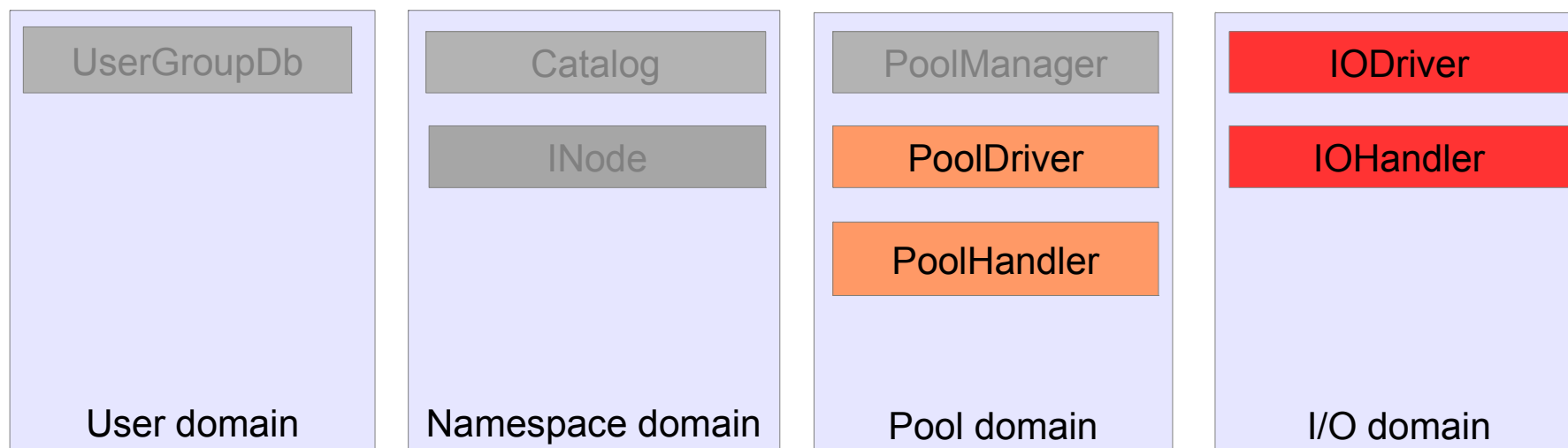
# Plugins: Memcache





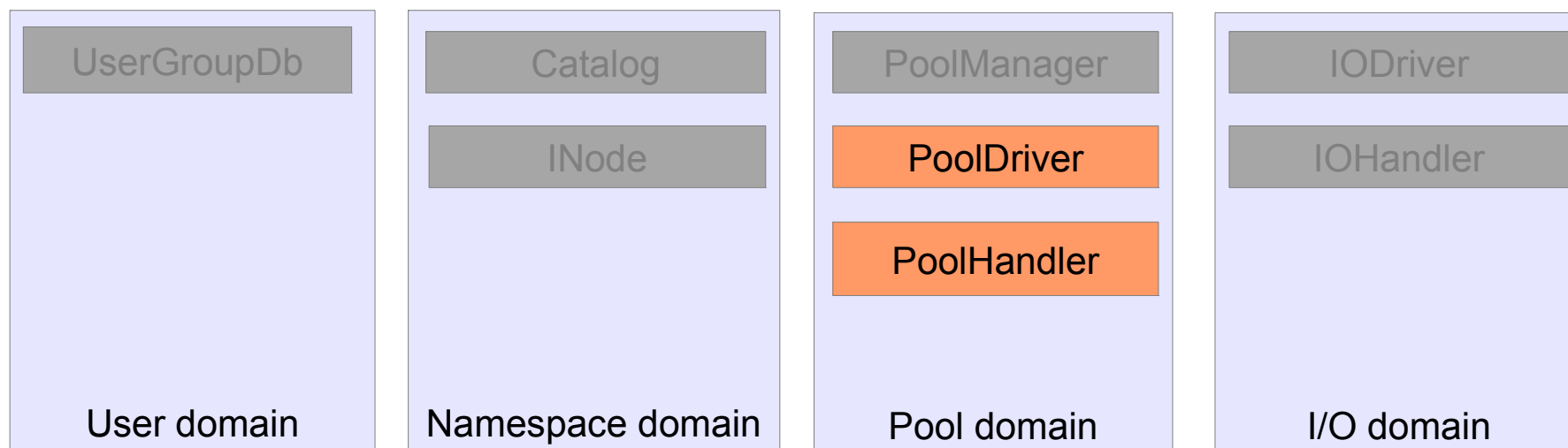
# Plugins: HDFS

- ▶ First new pool type
- ▶ HDFS pool can coexist with *legacy* pools, ...
  - ▶ In the same namespace, transparent to frontends
- ▶ All HDFS goodies for free (auto data replication, ...)
- ▶ *Catalog* interface coming soon

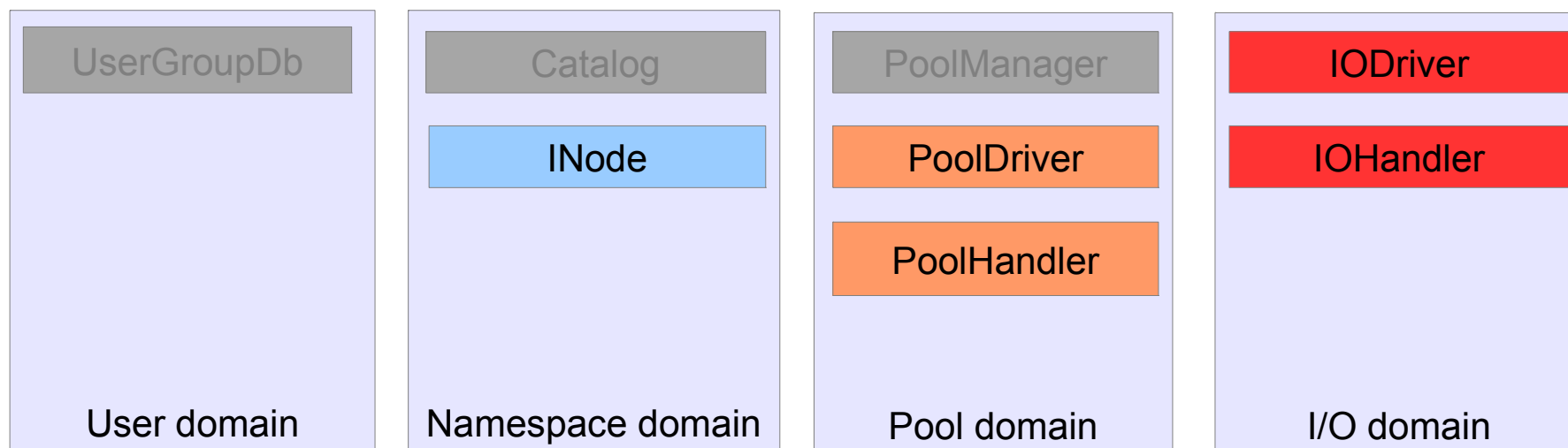


# Plugins: S3

- ▶ Second new pool type
- ▶ Again, can coexist with *legacy* pools, HDFS, ...
  - ▶ In the same namespace, transparent to frontends
- ▶ Main goal is to provide additional, temporary storage
  - ▶ High load periods, user analysis before big conferences, ...
  - ▶ Evaluated against Amazon, now looking at Huawei and OpenStack



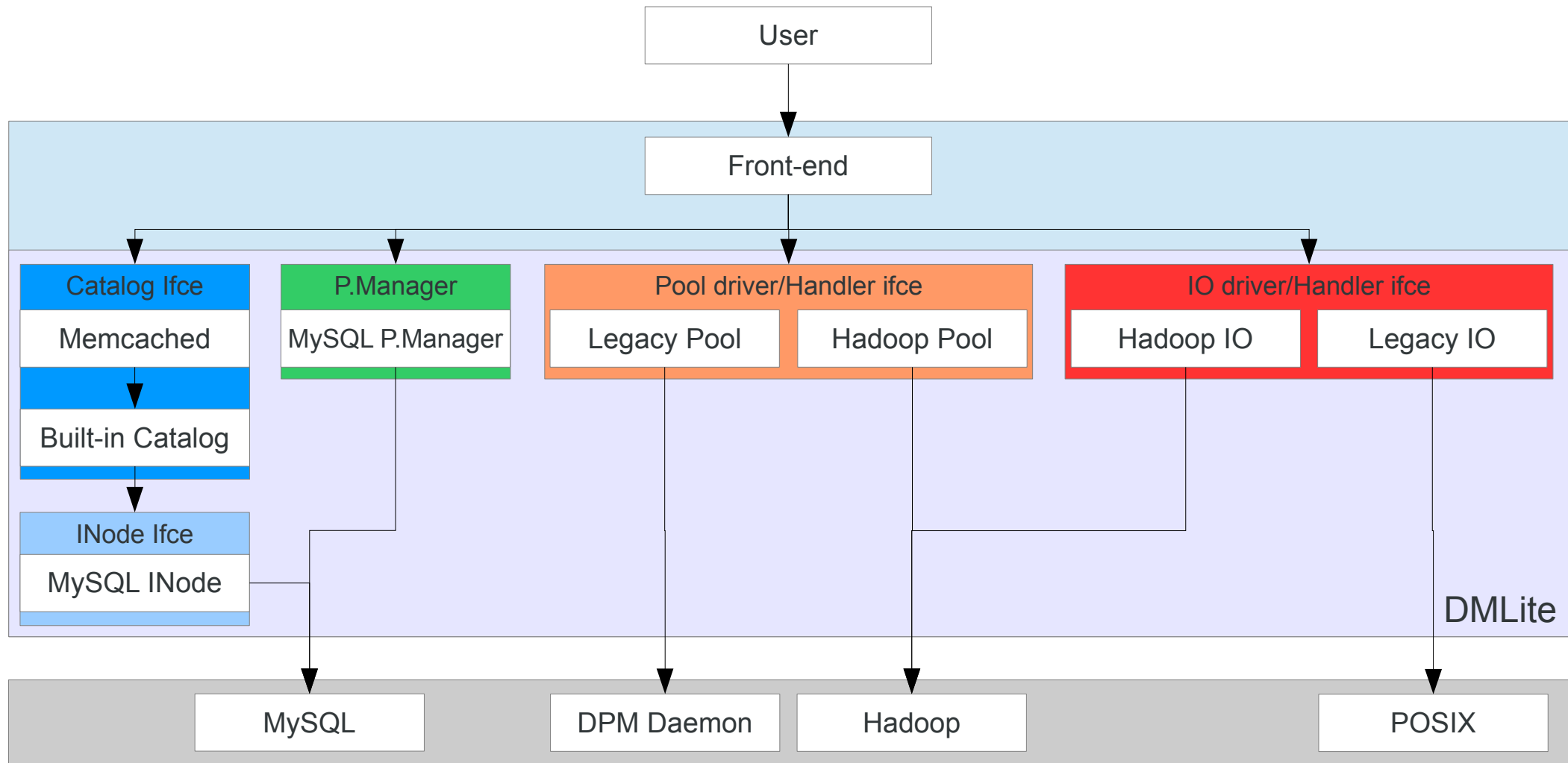
- ▶ Third new pool type (currently in development)
- ▶ Exposes any mountable filesystem
  - ▶ As an additional pool in an existing namespace
  - ▶ Or directly exposing that namespace
- ▶ Think Lustre, GPFS, ...



# Plugins: And more...

- ▶ Librarian
  - ▶ Replica failover and retrieval
  - ▶ Used by the HTTP/DAV frontend for a *Global Access Service*
- ▶ Profiler
  - ▶ Boosted logging capabilities
  - ▶ For every single call, logs response times per plugin
- ▶ HTTP based federations
- ▶ Writing plugins is very easy...
- ▶ ATLAS Rucio: first “external” plugin

# Filesystem integration



# Filesystem integration



EUROPEAN MIDDLEWARE INITIATIVE

**/dpm/cern.ch/home/dteam/demo/**

Mode	UID	GID	Size	Modified	Name
-rwxrwxr-x	7	107	20	Wed, 14 Nov 2012 14:54:32 GMT	<a href="#">copy.txt</a>
-rwxrwxr-x	7	103	20	Tue, 16 Oct 2012 14:56:58 GMT	<a href="#">filesystem.txt</a>
-rwxrwxr-x	7	103	23	Tue, 16 Oct 2012 15:14:50 GMT	<a href="#">hadoop.txt</a>
-rwxrwxr-x	7	103	15	Tue, 16 Oct 2012 15:57:25 GMT	<a href="#">s3.txt</a>

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*Request by /DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=aalvarez/CN=678984/CN=Alejandro Alvarez Ayllon (No proxy)  
Powered by LCGDM-DAV 0.12.0*