

# 7th International dCache Workshop Berlin

## Bits and Pieces 2013

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# Content

- New webpage
- IPv6 (OS, JVM, dCache)
- No PinManager for Tier 2
- Logback Configuration - central logging, log rotate
- ssh2 (authentication, how to configure)
- dcache script: ports, services, gPlazma explain login, status
- IT Hit
- Statistics: counters and monitoring dCache

# New Webpage

# New Webpage

- Remember? <http://<dcache instance>:2288> (old page /old)
- This looks now like this: (redirected to <http://<dcache instance>/webadmin/>)

Cell	Domain	Event queues	Thread count	Ping	Creation time	Version
LoginBroker	dCacheDomain	0	2	6	Sat May 18 10:51:50 CEST 2013	2.6.0(2013-05-02_11-48_hudson)
PnfsManager	dCacheDomain	0	23	1	Sat May 18 10:51:53 CEST 2013	2.6.0(2013-05-02_11-48_hudson)
PoolManager	dCacheDomain	0	3	1	Sat May 18 10:51:47 CEST 2013	2.6.0(2013-05-02_11-48_hudson)
NFSv41-vm-dcache-001	nfs-Domain	0	20	3	Sat May 18 10:51:38 CEST 2013	2.6.0(2013-05-02_11-48_hudson)
gPlazma	dCacheDomain	0	31	5	Sat May 18 10:52:01 CEST 2013	2.6.0(2013-05-02_11-48_hudson)
WebDAV-vm-dcache-001	webdavDomain	0	11	4	Sat May 18 10:51:38 CEST 2013	2.6.0(2013-05-02_11-48_hudson)
srm-	dCacheDomain	0	2	3	Sat May 18 10:52:18	2.6.0(2013-05-02_11-

- On login switch to https
- It has everything the old webpage had plus some more

# New Webpage - Cell Admin

- You need to be logged in, e.g. using kpwd or certificate based login
- Send commands to the services you would like to query

Logged in as admin | logout

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HOME   CELL SERVICES   POOL USAGE   POOL QUEUES   POOL QUEUE PLOTS  
POOLGROUPS   TAPE TRANSFER QUEUE   ACTIVE TRANSFERS   BILLING PLOTS  
POOL SELECTION SETUP   POOL ADMIN   **CELL ADMIN**   SPACE TOKENS   INFO XML   ALARMS

---

## CELL ADMIN

dCacheDomain : PoolManager :

Last command: psu ls pool -l

### Response of PoolManager@dCacheDomain

```
pool_read (enabled=true;active=29;rdOnly=false;links=3;pgroups=0;hsm=[osm];mode=enabled)
linkList :
regular-read-link (pref=10/10/10/0;;ugroups=3;pools=1)
reserved-read-link (pref=10/10/10/0;;ugroups=3;pools=1)
tape-read-link (pref=10/10/0/0;;ugroups=3;pools=1)
pool_sm (enabled=true;active=29;rdOnly=false;links=1;pgroups=0;hsm=[osm];mode=enabled)
linkList :
reserved-write-link (pref=10/0/0/10;;ugroups=3;pools=1)
pool_r3 (enabled=true;active=28;rdOnly=false;links=0;pgroups=1;hsm=[];mode=enabled)
linkList :
pool_write (enabled=true;active=0;rdOnly=false;links=2;pgroups=0;hsm=[osm];mode=enabled)
linkList :
regular-write-link (pref=0/0/0/10;;ugroups=3;pools=1)
tape-write-link (pref=0/0/0/10;;ugroups=3;pools=1)
pool_r2 (enabled=true;active=28;rdOnly=false;links=0;pgroups=1;hsm=[];mode=enabled)
linkList :
pool_r1 (enabled=true;active=28;rdOnly=false;links=0;pgroups=1;hsm=[];mode=enabled)
linkList :
```

- Response to the command
- Possible feature to work on: Create a web-based interactive shell

# New Webpage - Pool Admin

- You need to be logged in, e.g. using kpwd or certificate based login
- You can bulk execute commands on several pools (e.g. enable and disable)

Logged in as admin | [logout](#)

<a href="#">HOME</a>	<a href="#">CELL SERVICES</a>	<a href="#">POOL USAGE</a>	<a href="#">POOL QUEUES</a>	<a href="#">POOL QUEUE PLOTS</a>	
<a href="#">POOLGROUPS</a>	<a href="#">TAPE TRANSFER QUEUE</a>	<a href="#">ACTIVE TRANSFERS</a>	<a href="#">BILLING PLOTS</a>		
<a href="#">POOL SELECTION SETUP</a>	<b>POOL ADMIN</b>	<a href="#">CELL ADMIN</a>	<a href="#">SPACE TOKENS</a>	<a href="#">INFO XML</a>	<a href="#">ALARMS</a>

## POOL ADMIN

Last command: pool disable

## AVAILABLE POOLGROUPS

[DEFAULT](#) **RESILIENTPOOLS**

Selected	Name	Domain	Response
<input type="checkbox"/>	pool_r3	dCacheDomain	
<input checked="" type="checkbox"/>	pool_r2	dCacheDomain	Pool pool_r2 disabled()
<input checked="" type="checkbox"/>	pool_r1	dCacheDomain	Pool pool_r1 disabled()

- See list of pools and enable and disable pools

# New Webpage - Active Transfers

- You can find tranfers, kill them (you need to be logged in)

[HOME](#)  
 [CELL SERVICES](#)  
 [POOL USAGE](#)  
 [POOL QUEUES](#)  
 [POOLGROUPS](#)  
 [TAPE TRANSFER QUEUE](#)  
ACTIVE TRANSFERS

[POOL SELECTION SETUP](#)  
 [POOL ADMIN](#)  
 [CELL ADMIN](#)  
 [SPACE TOKENS](#)  
 [INFO XML](#)

## ACTIVE TRANSFERS

Quick Find:

Domain	Seq	Prot	Owner	Proc	Pnfsid	Pool	Status	Since	State	Trans. (KB)	Speed (KB/s)	Jobid
Select..	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Select..	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
nfs4Domain	1366740017594	NFSV4.1-0			00000C1FEAC6DCB8434CB92BE1C7397A3BC3	dcache-photon36-01		30 d 18:40:14		0	-	0
nfs4Domain	1366738574630	NFSV4.1-0			00008C24C655FA7A4AA38292616F2A911443	dcache-photon36-01		30 d 19:04:17		0	-	0
nfs4Domain	1366737495598	NFSV4.1-0			000095B33C5B36A84D649948BBCB9468A315	dcache-photon36-01		30 d 19:22:16		0	-	0
nfs4Domain	1366740376833	NFSV4.1-0			0000E1B5116D84984D49B6C206860AF8CE61	dcache-photon36-01		30 d 18:34:15		0	-	0
nfs4Domain	1366739749727	NFSV4.1-0			000000EA630A230645E59B3B56B05E69B25B	dcache-photon36-01		30 d 18:44:42		0	-	0

# IPv6



# IPv6

- Have a IPv6 configured OS
- JVM - IPv6 only
  - `dcache.java.options.extra=-Djava.net.preferIPv4Stack=false`
- Doors and Pools have to use same IPv

# No PinManager for Tier 2

- You are a Tier 2, have no tape
  - ▶ You do not need PinManager (you can speed up)
- For files that are REPLICATED ONLINE no pinning required
- Please listen to Dmitry for details

# Logback Configuration - central logging

Taken from Jens Larson NDGF

- LOGGING SERVER: Start central service (in FHS compliant dCache) by:
  - ▶ `java -cp "/usr/share/dcache/classes/lib/*" \`  
`ch.qos.logback.classic.net.SimpleSocketServer 6446 \`  
`/path/to/some/logback.xml`
- You can create an init script of this to start at boot time
- logback.xml on central service:

```
<configuration>
  <appender name="file" class="ch.qos.logback.core.rolling.RollingFileAppender">
    <file>/var/log/dcache/remote.log</file>
    <append>true</append>

    <encoder>
      <pattern>%d{dd MMM yyyy HH:mm:ss} \(%X{cells.domain}:%X{cells.cell}
        \) [%X{org.dcache.ndc}] %m%n</pattern>
    </encoder>
  </appender>

  <root>
    <appender-ref ref="file"/>
  </root>
</configuration>
```

# Logback Configuration - central logging

Taken from Jens Larson NDGF

- Set up logging on LOGGING CLIENT by adding to dCache's /etc/dcache/logback.xml

```
<appender name="remote" class="ch.qos.logback.classic.net.SocketAppender">  
  <RemoteHost>host.example.org</RemoteHost>  
  <Port>6446</Port>  
  <ReconnectionDelay>10000</ReconnectionDelay>  
  <IncludeCallerData>>false</IncludeCallerData>  
</appender>
```

- Add appender to logback root

```
<root>  
  <appender-ref ref="stdout"/>  
  <appender-ref ref="pinboard"/>  
  <appender-ref ref="remote"/>  
</root>
```

- Adjust log level of appender at end of logback.xml inside the turbofilter tag

```
<threshold>  
  <appender>remote</appender>  
  <logger>root</logger>  
  <level>warn</level>  
</threshold>
```

- Take care of security - no authentication on Port 6446

# Logback Configuration - log rotate

Taken from Jens Larson NDGF

- LOGGING SERVER: Let's look at the file from before again with log rotation enabled /var/lib/dcache/alarms

```
<configuration>
```

```
  <appender name="file" class="ch.qos.logback.core.rolling.RollingFileAppender">
```

```
    <file>/var/log/dcache/remote.log</file>
```

```
    <append>true</append>
```

```
    <rollingPolicy class="ch.qos.logback.core.rolling.TimeBasedRollingPolicy">
```

```
      <!-- weekly rollover -->
```

```
      <fileNamePattern>/var/log/dcache/remote.log.%d{yyyy-ww}.gz</fileNamePattern>
```

```
      <!-- keep 100 weeks worth of history -->
```

```
      <maxHistory>100</maxHistory>
```

```
    </rollingPolicy>
```

```
    <encoder>
```

```
      <pattern>%d{dd MMM yyyy HH:mm:ss} \(%X{cells.domain}:%X{cells.cell}) [%X{org.dcache.ndc}] %m  
%n</pattern>
```

```
    </encoder>
```

```
  </appender>
```

```
  <root>
```

```
    <appender-ref ref="file"/>
```

```
  </root>
```

```
</configuration>
```

- For more information see the logback documentation:  
<http://logback.qos.ch/documentation.html>
- The `CellThresholdFilter` concept is dCache specific, so you will not find a description of it in the logback manual. This was create to be able to set logging on cell level.

```
<turboFilter class="dmg.util.logback.CellThresholdFilter">  
  <!-- Important: This turboFilter must be instantiated after  
    appenders and loggers have been instantiated. -->
```

```
...
```

```
  <threshold>  
    <logger>org.dcache.services.ssh2</logger>  
    <level>debug</level>  
  </threshold>
```

```
</turboFilter>
```

# ssh2 - authentication and configuration

- Currently both doors (ssh1, ssh2) are started by default (configurable)
- ssh1 and ssh2 Ports configurable

```
(one-of?ssh1|ssh2|both) sshVersion=both

# ---- TCP port
#
adminPort=22223
admin/port=${adminPort}
# ssh2 Admin port
admin.ssh2AdminPort=22224

# ---- Admin group
#
# This property defines the GID of the group containing all users
# allowed administrate dCache (via ssh2).
admin.ssh2.gid=0
```

- Admin user GID configurable, default admin GID 0

# ssh2 - KPWD authentication

- Authentication via kpwd file needs a configured gPlazma (attributes might differ in your gPlazma config)

```
auth    optional kpwd
map     optional kpwd
session optional kpwd
```

- Creation of admin user entry in dcache.kpwd file (dcache command):

```
[root@vm-dcache-001 ~]# dcache kpwd dcuseradd -u 1000 -g 0 -h / -r / -f / -w read-write -p dickerelch admin
# the following are the user password records
passwd admin 4db02d72 read-write 1000 0 / /
```

- User “admin” is a special user that has all permissions
- If you wish to create a different username than admin, create it via the dcache command and grant rights via ACLs using the admin user  
<http://www.dcache.org/manuals/Book-2.6/config/cf-acl-admin-fhs.shtml>



# ssh2 - public key authentication

- Authentication with `authorized_keys2` file - just add `ssh pub.key` to the file

```
admin.authorizedKey2=${dcache.paths.ssh-keys}/authorized_keys2
```

- ▶ “`ssh -l admin -p 22224 localhost`” successful login and ACLs set
- ▶ “`ssh -l test -p 22224 localhost`” successful login and NO ACLs set
- A gPlazma plugin for key-based login not there yet
- KeyBased login with other user than admin will succeed --> BUT: set ACLs for this user need to be able to administrate dCache  
<http://www.dcache.org/manuals/Book-2.6/config/cf-acl-admin-fhs.shtml>

# dCache script

- dcache status --> time from startup

```
[root@vm-dcache-001 ~]# dcache status
DOMAIN          STATUS          PID  USER
dCacheDomain    running (for 26 hours) 20354 dcache
nfs-Domain      running (for 25 hours) 21800 dcache
poolDomain      running (for 26 hours) 20449 dcache
webdavDomain    running (for 24 hours) 23219 dcache
```

- dcache services

```
[root@vm-dcache-001 ~]# dcache services
DOMAIN          SERVICE          CELL          LOG
dCacheDomain    admin            alm           /var/log/dcache/dCacheDomain.log
dCacheDomain    broadcast        broadcast     /var/log/dcache/dCacheDomain.log
dCacheDomain    poolmanager     PoolManager   /var/log/dcache/dCacheDomain.log
dCacheDomain    loginbroker     LoginBroker   /var/log/dcache/dCacheDomain.log
dCacheDomain    spacemanager    SrmSpaceManager /var/log/dcache/dCacheDomain.log
dCacheDomain    pnfsmanager     PnfsManager   /var/log/dcache/dCacheDomain.log
dCacheDomain    cleaner         cleaner       /var/log/dcache/dCacheDomain.log
dCacheDomain    dir             dirLookupPool /var/log/dcache/dCacheDomain.log
dCacheDomain    gplazma         gPlazma      /var/log/dcache/dCacheDomain.log
dCacheDomain    pinmanager     PinManager    /var/log/dcache/dCacheDomain.log
dCacheDomain    billing         billing       /var/log/dcache/dCacheDomain.log
dCacheDomain    srm-loginbroker srm-LoginBroker /var/log/dcache/dCacheDomain.log
dCacheDomain    httpd          httpd        /var/log/dcache/dCacheDomain.log
dCacheDomain    topo          topo         /var/log/dcache/dCacheDomain.log
dCacheDomain    info          info         /var/log/dcache/dCacheDomain.log
nfs-Domain      nfsv41          NFSv41-vm-dcache-001 /var/log/dcache/nfs-Domain.log
poolDomain      pool            nfsPool      /var/log/dcache/poolDomain.log
webdavDomain    webdav         WebDAV-vm-dcache-001 /var/log/dcache/webdavDomain.log
```

- dcache ports

```
[root@vm-dcache-001 ~]# dcache ports
DOMAIN          CELL          SERVICE  PROTO  PORT
dCacheDomain    -            -        TCP    11111
dCacheDomain    -            -        UDP    11111
dCacheDomain    -            -        UDP    0
dCacheDomain    alm         admin    TCP    22223
dCacheDomain    alm         admin    TCP    22224
dCacheDomain    httpd      httpd    TCP    2288
dCacheDomain    info       info     TCP    22112
nfs-Domain      -            -        UDP    0
nfs-Domain      NFSv41-vm-dcache-001 nfsv41  TCP    (111)
nfs-Domain      NFSv41-vm-dcache-001 nfsv41  TCP    2049
nfs-Domain      NFSv41-vm-dcache-001 nfsv41  UDP    (111)
poolDomain      -            -        UDP    0
poolDomain      nfsPool     pool     TCP    20000-25000
poolDomain      nfsPool     pool     TCP    33115-33145
webdavDomain    -            -        UDP    0
webdavDomain    WebDAV-vm-dcache-001 webdav  TCP    2880
```

# dCache script

- dcache database ls

```
[root@vm-dcache-021 ~]# dcache database ls
```

DOMAIN	CELL	DATABASE	HOST	USER	MIN-	MAX-	CONNNS	MANAGEABLE	AUTO
namespaceDomain	PnfsManager	chimera	localhost	chimera	30	90		Yes	Yes
namespaceDomain	cleaner	chimera	localhost	chimera				No	No
infoDomain	billing	billing	localhost	srmdcache	3	30		Yes	Yes
utilityDomain	PinManager	dcache	localhost	srmdcache				Yes	Yes
utilityDomain	SrmSpaceManager	dcache	localhost	srmdcache				No	Yes
utilityDomain	RemoteTransferManager	dcache	localhost	srmdcache				No	Yes
srm-vm-dcache-021Domain	SRM-vm-dcache-021	dcache	localhost	srmdcache				No	Yes
TOTAL					33	120			

# IT Hit - dCache WebDAV

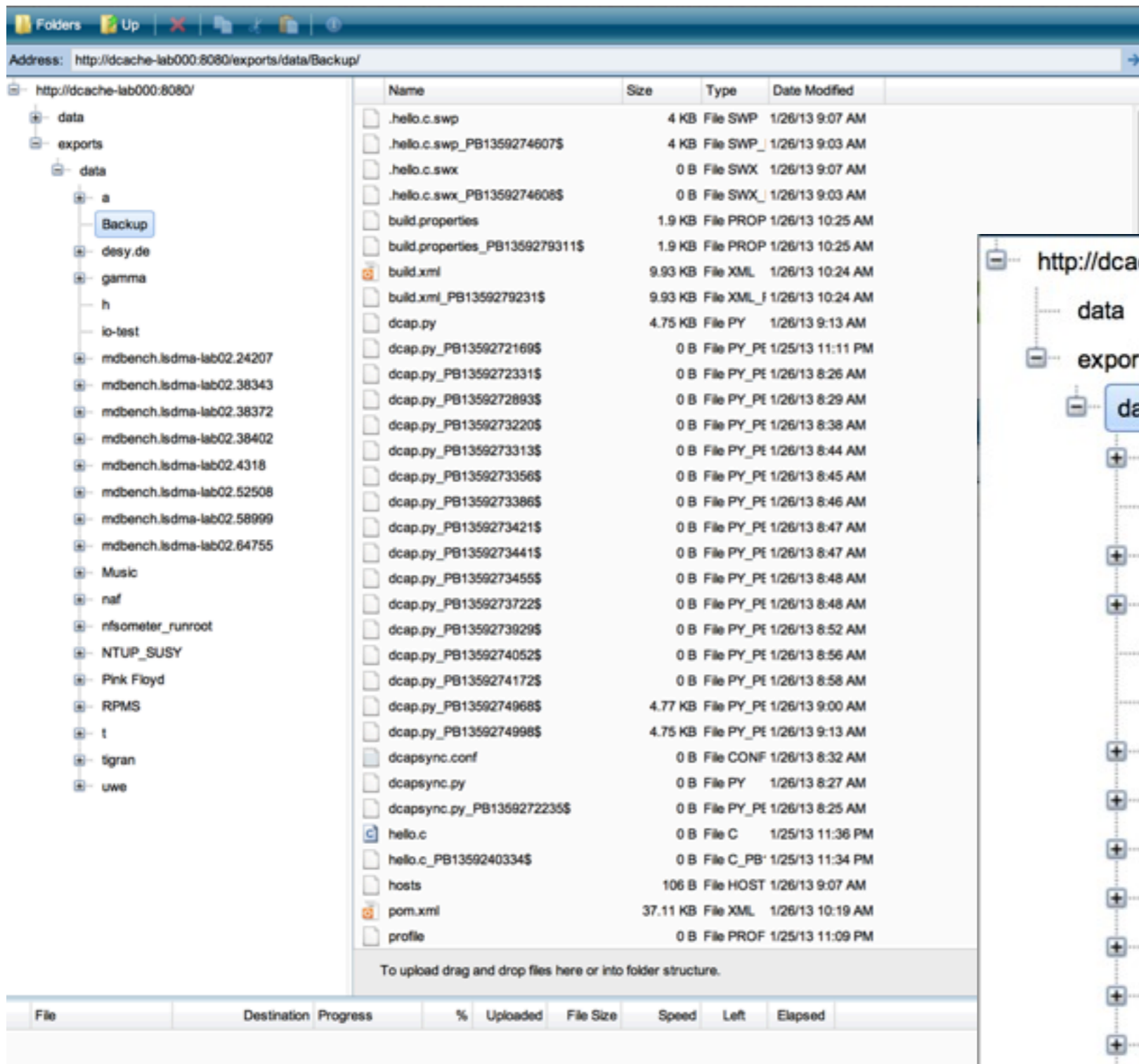
- Commercial third party product that we bought
- Server-side WebDAV interface accessible via browser
- Will be distributed as a additional package (no sources, just binary - license) --> just install the package
- Works with all supported security mechanisms like password, SSL, user certificates
- Drag & Drop for upload possible

To upload drag and drop files here or into folder structure.

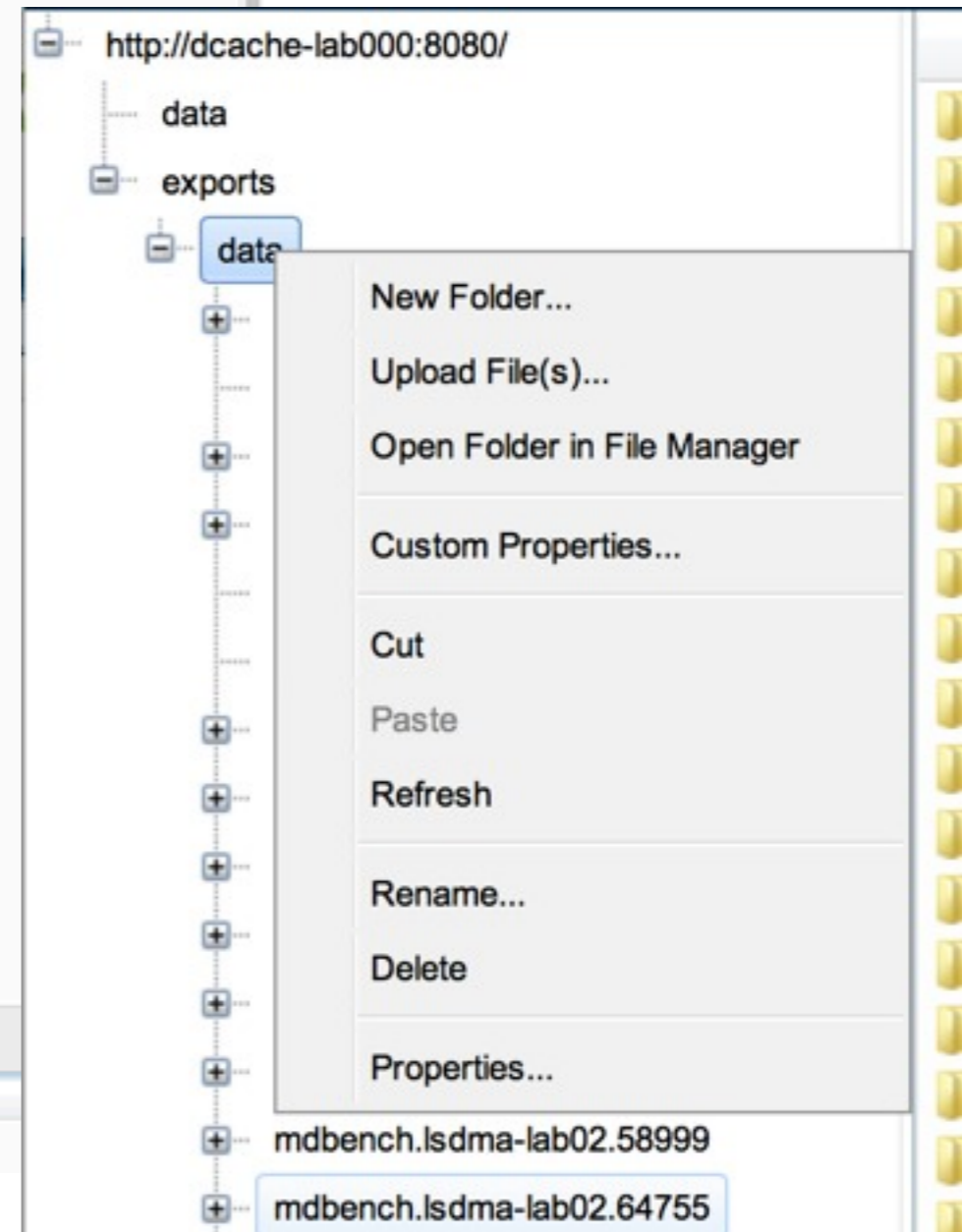
Browse...

- tested it with 2.6 and trunk
- Reachable via <https://<server address>:8080/.webdav/browser/>

# IT Hit - GUI WebDAV Interface



Name	Size	Type	Date Modified
.hello.c.swp	4 KB	File SWP	1/26/13 9:07 AM
.hello.c.swp_PB1359274607\$	4 KB	File SWP_	1/26/13 9:03 AM
.hello.c.swx	0 B	File SWX	1/26/13 9:07 AM
.hello.c.swx_PB1359274608\$	0 B	File SWX_	1/26/13 9:03 AM
build.properties	1.9 KB	File PROP	1/26/13 10:25 AM
build.properties_PB1359279311\$	1.9 KB	File PROP	1/26/13 10:25 AM
build.xml	9.93 KB	File XML	1/26/13 10:24 AM
build.xml_PB1359279231\$	9.93 KB	File XML_f	1/26/13 10:24 AM
dcap.py	4.75 KB	File PY	1/26/13 9:13 AM
dcap.py_PB1359272169\$	0 B	File PY_PE	1/25/13 11:11 PM
dcap.py_PB1359272331\$	0 B	File PY_PE	1/26/13 8:26 AM
dcap.py_PB1359272893\$	0 B	File PY_PE	1/26/13 8:29 AM
dcap.py_PB1359273220\$	0 B	File PY_PE	1/26/13 8:38 AM
dcap.py_PB1359273313\$	0 B	File PY_PE	1/26/13 8:44 AM
dcap.py_PB1359273356\$	0 B	File PY_PE	1/26/13 8:45 AM
dcap.py_PB1359273386\$	0 B	File PY_PE	1/26/13 8:46 AM
dcap.py_PB1359273421\$	0 B	File PY_PE	1/26/13 8:47 AM
dcap.py_PB1359273441\$	0 B	File PY_PE	1/26/13 8:47 AM
dcap.py_PB1359273455\$	0 B	File PY_PE	1/26/13 8:48 AM
dcap.py_PB1359273722\$	0 B	File PY_PE	1/26/13 8:48 AM
dcap.py_PB1359273929\$	0 B	File PY_PE	1/26/13 8:52 AM
dcap.py_PB1359274052\$	0 B	File PY_PE	1/26/13 8:56 AM
dcap.py_PB1359274172\$	0 B	File PY_PE	1/26/13 8:58 AM
dcap.py_PB1359274968\$	4.77 KB	File PY_PE	1/26/13 9:00 AM
dcap.py_PB1359274998\$	4.75 KB	File PY_PE	1/26/13 9:13 AM
dcapsync.conf	0 B	File CONF	1/26/13 8:32 AM
dcapsync.py	0 B	File PY	1/26/13 8:27 AM
dcapsync.py_PB1359272235\$	0 B	File PY_PE	1/26/13 8:25 AM
hello.c	0 B	File C	1/25/13 11:36 PM
hello.c_PB1359240334\$	0 B	File C_PB	1/25/13 11:34 PM
hosts	106 B	File HOST	1/26/13 9:07 AM
pom.xml	37.11 KB	File XML	1/26/13 10:19 AM
profile	0 B	File PROF	1/25/13 11:09 PM



- New Folder...
- Upload File(s)...
- Open Folder in File Manager
- Custom Properties...
- Cut
- Paste
- Refresh
- Rename...
- Delete
- Properties...

# Statistics: counters

# Statistics: counters in PNFS

- PnfsManager admin interface command: info

```

Statistics:
PnfsManagerV3
  average±stderr (ms)    min (ms)    max (ms)    STD (ms)    Sampes    SamplingPeriod (ms)
PnfsRemoveChecksumMessage    13    0±    NaN    0    0    19459526
PnfsClearCacheLocationMessage    0±    NaN    0    0    0    19459549
PnfsSetFileMetaDataMessage    0±    NaN    0    0    0    19459545
PnfsGetFileAttributes    61± 25.980762    28    124    45    3    19459527
PnfsListDirectoryMessage    0±    NaN    0    0    0    19459526
PnfsGetCacheLocationsMessage    0±    NaN    0    0    0    19459549
PnfsSetFileAttributes    0±    NaN    0    0    0    19459533
PnfsSetChecksumMessage    0±    NaN    0    0    0    19459534
PnfsGetChecksumAllMessage    0±    NaN    0    0    0    19459533
PnfsGetChecksumMessage    0±    NaN    0    0    0    19459534
PnfsGetParentMessage    0±    NaN    0    0    0    19459533
PnfsCreateEntryMessage    0±    NaN    0    0    0    19459547
PnfsGetStorageInfoMessage    0±    NaN    0    0    0    19459547
PnfsRenameMessage    0±    NaN    0    0    0    19459535
PnfsAddCacheLocationMessage    0±    NaN    0    0    0    19459550
PnfsGetFileMetaDataMessage    0±    NaN    0    0    0    19459546
PnfsCreateDirectoryMessage    0±    NaN    0    0    0    19459549
PnfsMapPathMessage    0±    NaN    0    0    0    19459546
PoolFileFlushedMessage    0±    NaN    0    0    0    19459534
PnfsDeleteEntryMessage    0±    NaN    0    0    0    19459547
PnfsFlagMessage    0±    NaN    0    0    0    19459534
PnfsManagerV3.Folded
  requests    failed
Total    0    0
  
```

- Usefulness of counters:
- E.g.: deduce from high response time in PnfsDeleteEntryMessage that database schema might be off, or database harmed in other way

# Statistics: counters in nfs Door

- NFS door admin interface command: stats

```
[vm-dcache-001.desy.de] (NFSv41-vm-dcache-001@nfs-Domain) admin > stats
Stats:
org.dcache.chimera.nfs.v4.NFSServerV41
OPEN          average±stderr (ms)      min (ms)  logbase  max (ms)  rolling  STD (ms)  sedRoll  Samples  SamplingPeriod (ms)
RESTOREFH     47024197±25055322.170897  8317237  107624371  43397091  3        1068407
SEQUENCE      56142±33444.746394       15049    138065     57928     3        1068490
GETDEVICEINFO 42829±4078.554616       23573    2155702    109287    718     20107245
CLOSE         1113509± 0.000000        1113509  1113509    0         1        1067097
LAYOUTGET     194421792±146662807.401450  13678856  553668509  254027434  3        1064610
GETFH         504755980±357630326.600779  64327541  1380763323  619433896  3        1067102
PUTFH         453153±351464.285770     22561    1314062    608754    3        1068494
ACCESS        622693±574443.785604     33110    25609325   3810429   44       1084360
PUTROOTFH     17770751±7929267.883808   6871095  53044633   17730382  5        1083642
CREATE_SESSION 958671±570676.184611     151613   1765729    807058    2        20107232
RECLAIM_COMPLETE 11511090±7991241.422573  209768   22812412   11301322  2        20107266
SAVEFH        48879±32616.714496       2753     95006     46127     2        20107168
EXCHANGE_ID   94233±62788.573825       14217    247991    108753    3        1068624
GETATTR       11839416±8284722.556570   123050   23555783   11716367  2        20107295
REaddir       14547318±7811152.661317   1742180  352670976  52398805  45       20107182
REaddir       105818593± 0.000000       105818593  105818593  0         1        1072810
```

- Usefulness of counters:

- E.g.:

- client log saying: nfs server timeout
- Reason for server time out identifiable by which requests take longest

- ms here are ns



# Statistics: counters in SRM Door

- SRM door admin interface command: print srm counters

```
[vm-dcache-se.desy.de] (SRM-vm-dcache-se) admin > print srm counters
```

SRMServerV1	average?stderr (ms)	min (ms)	max (ms)	STD (ms)	Sampes	SamplingPeriod (ms)
put	51? 0.000000	51	51	0	1	357231012
get	825? 0.000000	825	825	0	1	357214641
setFileStatus	12? 7.071068	3	22	10	2	357223014
getRequestStatus	13? 4.041452	1	120	28	48	357225706
SRMServerV2	average?stderr (ms)	min (ms)	max (ms)	STD (ms)	Sampes	SamplingPeriod (ms)
SrmMkdirRequest	1430? 0.000000	1430	1430	0	1	357322776
SrmRmRequest	362? 0.000000	362	362	0	1	357239743
SrmPrepareToPutRequest	976? 0.000000	976	976	0	1	357282986
SrmMvRequest	61? 0.000000	61	61	0	1	357248453
SrmStatusOfPutRequestRequest	40? 0.000000	40	40	0	1	357278629
SrmLsRequest	1846?1087.150557	60	4450	1883	3	357366998
SrmSetPermissionRequest	228? 0.000000	228	228	0	1	357312113
SrmPutDoneRequest	72? 0.000000	72	72	0	1	357258754
diskCacheV111.srm.dcache.Storage	average?stderr (ms)	min (ms)	max (ms)	STD (ms)	Sampes	SamplingPeriod (ms)
pinFile (SRMUser URI String long lo	7? 0.000000	7	7	0	1	357214634
supportedGetProtocols ()	3? 2.121320	0	6	3	2	357215440
srmUnmarkSpaceAsBeingUsed (SRMUser	5? 1.414214	5	6	2	2	357258758
prepareToPut (SRMUser URI PrepareTo	29? 17.677670	4	54	25	2	357282931
exists (SRMUser URI)	14? 0.000000	14	14	0	1	357223021
srmReleaseSpace (SRMUser String Lon	1? 0.707107	1	2	1	2	357258755
supportedPutProtocols ()	1? 0.577350	0	3	1	3	357283140
srmMarkSpaceAsBeingUsed (SRMUser St	2? 0.707107	1	3	1	2	357282344
listDirectory (SRMUser URI boolean	579?183.140656	321	838	259	2	357367004
srmReserveSpace (SRMUser long long	7? 4.242641	1	13	6	2	357282852
getPutTurl (SRMUser URI String[])	11? 4.949747	5	18	7	2	357278631
getFileMetaData (SRMUser URI boolea	447?299.067439	35	1178	518	3	357367326

- Usefulness of counters:
  - E.g.: SRM is slow, investigation possible through counters

# Statistics: admin interface

## monitor enable, monitor info

- In any service that is based on Universal Spring Cells you enter these commands
- monitor enable: The monitor command will then collect the messages in this cell
- monitor info: shows the collected stats

# Statistics: Report and Monitor with Nagios, Ganglia

- Please report the statistics with the RT ticket for faster problem analysis
- All of the statistics can be queried via JMX, which can be made visible by nagios plugin, or ganglia
  - <http://code.google.com/p/jmxquery/>
  - <https://github.com/ganglia/jmxetric>

# User-Forum Searchable Archive

- Please find page: <https://lists.dcache.org/sympa/arc/user-forum>

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# dCache Installation

## Hands-on

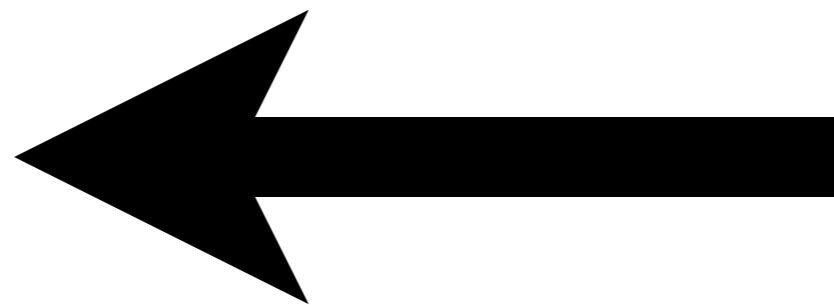
### Room 101



# dCache Installation

## Hands-on

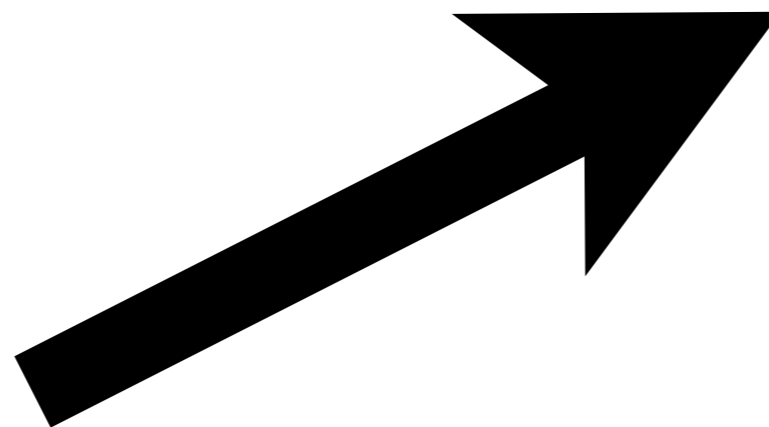
### Room 101



# dCache Installation

## Hands-on

### Room 101



# dCache Developers' Hands-on Room H001





# dCache Developers' Hands-on Room H001

