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Manual Configuration

This is really a guide for experts, site admins should follow the puppet installation at [Puppet Installation Guide](#)

The guide is valid both for SL6 and SL7/C7 installations, the differences between the 2 OSs are highlighted

DPM Terminology

- **Head Node** References the Legacy DPM, DPNS, SRM daemons and the database service (even if they might be split in different machines)
- **Disk Servers / Pool Nodes** Machines where data is actually stored
- **Client** Remote machine talking to the "Head Node" and "Disk Servers"

Firewall Configuration

The following ports should be open, depending on the protocols you intend to use.

Headnode:

- **DPM**: 5015/tcp (local)
- **DPNS**: 5010/tcp (local)
- **SRM**: 8446/tcp for "SRMv2.2" (local and internet)
- or by setting \$RFIO_PORT_RANGE
- **GRIDFTP**: 2811/tcp , 20000-25000/tcp (local and internet)
- or by setting \$GLOBUS_TCP_PORT_RANGE, \$GLOBUS_TCP_SOURCE_RANGE
- **LCGDM-DAV**: 443/tcp (local and internet)
- **DPM-XROOTD**: 1094/tcp (local and internet) (in case of federations also the port 1095 for cmsd and one port for each federation should be opened locally and to the internet)
- **BDII**: 2170/tcp (local and internet)

Disknode:

- **RFIO**: 5001/tcp, 20000-25000/tcp (local)
- **GRIDFTP**: 2811/tcp (local and internet, **N.B. in case the DPM is configured with gridftp redirection this port should be firewalled to internet**) , 20000-25000/tcp (local and internet)
- **LCGDM-DAV**: 443/tcp and 80/tcp (local and internet)
- **DPM-XROOTD**: 1095/tcp (local and internet)

Create the "dpmmgr" user

N.B The "dpmmgr" user UID/GID MUST be the same both in the disk server and head node

```
# groupadd -g 151 dpmmgr
# useradd -c "DPM manager" -g dpmmgr -u 151 -r -m dpmmgr
```

Security configuration

Copy the host certificate/key pair to "/etc/grid-security/dpmmgr", owned by "dpmmgr"

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```
# mkdir /etc/grid-security/dpmmgr
# cp /etc/grid-security/hostcert.pem /etc/grid-security/dpmmgr/dpmcert.pem
# cp /etc/grid-security/hostkey.pem /etc/grid-security/dpmmgr/dpmkey.pem
# chown -R dpmmgr.dpmmgr /etc/grid-security/dpmmgr
```

N.B. Do not remove the original host certificates

Have the node trust the VOMS servers to be supported

Under `/etc/grid-security/vomsdir`, add a `<vo-name>` directory for each VO to be supported. Inside it add a "lsc" file corresponding to the VOMS server(s) for that VO, containing the DN of the server and CA issuing it:

```
# mkdir -p /etc/grid-security/vomsdir/dteam
# vim /etc/grid-security/vomsdir/dteam/lxbra2309.cern.ch.lsc
/DC=ch/DC=cern/OU=computers/CN=lxbra2309.cern.ch
/DC=ch/DC=cern/CN=CERN Trusted Certification Authority
```

If not using VOMS, add the mapping for each certificate / pool pair

```
# vim /etc/lcgdm-mapfile
"/DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=rocha/CN=617758/CN=Ricardo Brito Da Rocha" dteam
```

IPV6 Configuration

If you are installing on a SL7/C7 machine, the DPM services and frontends are going to work out of the box with IPv6

On SL6/C6 instead the configuration file `/etc/gai.conf` must be created with the following content

```
label ::1/128 0
label ::/0 1
label 2002::/16 2
label ::/96 3
label ::ffff:0:0/96 4
label fec0::/10 5
label fc00::/7 6
label 2001:0::/32 7
label ::ffff:7f00:0001/128 8
```

to let gridftp and SRM correctly bind to IPv6.

Setup the Database

The DB can be installed directly on the Headnode or on a dedicated machine

For performance reason is suggested to have a dedicated node running the DB.

DPM supports both Mysql 5.1 and 5.5 on SL6

Make sure the MySQL daemon is running

```
# service mysqld start
```

Load the database schema

```
# mysql -u root < /usr/share/lcgdm/create_dpns_tables_mysql.sql
# mysql -u root < /usr/share/lcgdm/create_dpm_tables_mysql.sql
```

Security configuration

Setup the DPM database user (replace DPNS_HOST / DPM_HOST/ DPMUSER/ DPMPASS with your config values)

```
# mysql -u root
mysql> use mysql
mysql> GRANT ALL PRIVILEGES ON dns_db.* TO 'DPMUSER'@DPNS_HOST IDENTIFIED BY 'DPMPASS' WITH GRANT
mysql> GRANT ALL PRIVILEGES ON dns_db.* TO 'DPMUSER'@localhost IDENTIFIED BY 'DPMPASS' WITH GRANT
mysql> GRANT ALL PRIVILEGES ON dpm_db.* TO 'DPMUSER'@DPM_HOST IDENTIFIED BY 'DPMPASS' WITH GRANT
mysql> GRANT ALL PRIVILEGES ON dpm_db.* TO 'DPMUSER'@localhost IDENTIFIED BY 'DPMPASS' WITH GRANT
```

DPM supports both MariaDB 5.5 on C7.

As MariaDB is quite demanding in terms of file descriptors we suggest to configured with

```
[Service]
LimitNOFILE = infinity
LimitMEMLOCK = infinity
```

inside the /usr/lib/systemd/system/mariadb.service.d/override.conf (to create if does not exists)

Make sure the MariaDB daemon is running

```
systemctl status mariadb
```

Load the database schema

```
mysql -u root < /usr/share/lcgdm/create_dpns_tables_mysql.sql
mysql -u root < /usr/share/lcgdm/create_dpm_tables_mysql.sql
```

Setup the DPM database user (replace DPNS_HOST / DPM_HOST/ DPMUSER/ DPMPASS with your config values)

```
mysql -u root
mysql> use mysql
mysql> GRANT ALL PRIVILEGES ON dns_db.* TO 'DPMUSER'@DPNS_HOST IDENTIFIED BY 'DPMPASS' WITH GRANT
mysql> GRANT ALL PRIVILEGES ON dns_db.* TO 'DPMUSER'@localhost IDENTIFIED BY 'DPMPASS' WITH GRANT
mysql> GRANT ALL PRIVILEGES ON dpm_db.* TO 'DPMUSER'@DPM_HOST IDENTIFIED BY 'DPMPASS' WITH GRANT
mysql> GRANT ALL PRIVILEGES ON dpm_db.* TO 'DPMUSER'@localhost IDENTIFIED BY 'DPMPASS' WITH GRANT
```

Configuring a Head Node

Core Daemons setup and configuration

The available daemons in a Legacy installation are "dpnsdaemon, dpm, srmv2.2"

The installation of the legacy daemon on a headnode can be performed by installing the following metapackage

```
yum install dmlite-dpmhead
```

For each of the daemons create the configuration from the corresponding template file

```
cp /etc/sysconfig/<daemon-name>.templ /etc/sysconfig/<daemon-name>
vim /etc/sysconfig/<daemon-name>
... set the config options as appropriate ...
```

Configure each of the daemons by editing the config file (options are documented inside)

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```
vim /etc/sysconfig/<daemon-name>
```

Specify the database names

```
vim /usr/etc/NSCONFIG
```

fill the values as in this template (replace DBHOST / DPMUSER/ DPMPASS with your config values)

```
DPMUSER/DPMPASS@DBHOST
```

and

```
vim /usr/etc/DPMCONFIG
```

fill the values as in this template (replace DBHOST / DPMUSER/ DPMPASS with your config values)

```
DPMUSER/DPMPASS@DBHOST
```

lastly

```
chown dpmmgr.dpmmgr /usr/etc/NSCONFIG /usr/etc/DPMCONFIG
```

You can now start each of the daemons you've configured

```
#SL6  
service <daemon-name> start
```

```
#C7  
systemctl start <daemon-name>
```

Finally, create the initial directory structure (repeat for each domain / VO you support)

You'll need to use the same certificate as the one used by the DPNS daemon

```
export PATH=$PATH:/usr/bin:/usr/sbin  
export X509_USER_CERT=/etc/grid-security/hostcert.pem  
export X509_USER_KEY=/etc/grid-security/hostkey.pem  
export DPNS_HOST=localhost
```

```
dpns-mkdir -p /dpm/<domain>/home/<vo-name>  
dpns-chmod 775 /dpm/<domain>/home/<vo-name>  
dpns-entergrpmap --group <vo-name>  
dpns-chown root:<vo-name> /dpm/<domain>/home/<vo-name>  
dpns-setacl -m d:u::7,d:g::7,d:o:5 /dpm/<domain>/home/<vo-name>
```

As an example, for domain "cern.ch" and VO "dteam"

```
dpns-mkdir -p /dpm/cern.ch/home/dteam  
dpns-chmod 775 /dpm/cern.ch/home/dteam  
dpns-entergrpmap --group dteam  
dpns-chown root:dteam /dpm/cern.ch/home/dteam  
dpns-setacl -m d:u::7,d:g::7,d:o:5 /dpm/cern.ch/home/dteam
```

Dmlite configuration

The dmlite core and basic plugins are installed together with the **dmlite-dpmhead** metapackage

The base configuration file for dmlite is the /etc/dmlite.conf which can be used to configure the logging level (Default=1, Max= 4)

Then the configuration of the dmlite plugins should be performed

Dmlite Adapter plugin configuration

The file `/etc/dmlite.conf.d/adapter.conf` should be configured as follows:

```
LoadPlugin plugin_fs_rfio /usr/lib64/dmlite/plugin_adapter.so
LoadPlugin plugin_fs_pooldriver /usr/lib64/dmlite/plugin_adapter.so

# Remote DPM/LFC host to connect to
DpmHost <headnode FQDN>
NsHost <headnode FQDN>

# Pool size
ConnPoolSize 10
# Timeout when connection to the NsHost (in seconds)
ConnectionTimeout 15
# Number of retries when connecting to NsHost (in seconds)
RetryLimit 3
# Interval between retries when connecting to NsHost (in seconds)
RetryInterval 2

# Token generation
TokenPassword <Token password to be identical on the whole cluster>
TokenId ip
TokenLife 1000
```

Dmlite plugin configuration

The file `/etc/dmlite.conf.d/mysql.conf` should be configured as follows:

```
LoadPlugin plugin_mysql_ns /usr/lib64/dmlite/plugin_mysql.so
LoadPlugin plugin_mysql_dpm /usr/lib64/dmlite/plugin_mysql.so

# MySQL connection parameters
MySqlHost <DPM DB HOST>
MySqlUsername <DPM DB USERNAME>
MySqlPassword <DPM DB PASSWORD>
MySqlPort 0 ( 0 means the default port 3306)

# NS database
NsDatabase cns_db

# DPM database
DpmDatabase dpm_db

# Connection pool size
NsPoolSize 128

# Grid mapfile
MapFile /etc/lcgdm-mapfile

# Give too access to the host DN
HostDNIsRoot yes

# Needed to set the host DN
HostCertificate /etc/grid-security/dpmmgr/dpmcert.pem
```

Dmlite Memcache plugin and Memcache server configuration

Optionally the "dmlite-plugins-memcache" package can be installed and configured on the system.

It should be used in junction with a Memcached server to be installed locally to the Headnode or remotely.

To install the Memcached server just run

```
yum install memcached
```

the configuration of the server (etc/sysconfig/memcached) should be as follows

```
PORT="11211"  
USER="memcached"  
MAXCONN="8192"  
CACHE_SIZE="2048"  
OPTIONS="-l 127.0.0.1 -U 11211 -t 4"
```

The plugin can then be installed via

```
yum install dmlite-plugins-memcache
```

and configured via the conf file /etc/dmlite.conf.d/zmemcache.conf as follows

```
LoadPlugin plugin_memcache /usr/lib64/dmlite/plugin_memcache.so  
  
# Can be set multiple times to use multiple caches, format <host>:<port>:<weight>  
MemcachedServer localhost:11211  
  
# # Limit of symlinks to follow  
SymLinkLimit 5  
  
# Size of the memcache connection pool  
MemcachedPoolSize 250  
  
# Expiration of an entry in memcache (in seconds)  
MemcachedExpirationLimit 600  
  
# Use the 'ascii' or 'binary' protocol  
MemcachedProtocol binary  
  
# use 'standard', or use 'consistent' for consistent hashing (useful when adding servers to the p  
MemcachedHashDistribution default  
  
# 'on' or 'off', use recursive permission checking or not  
MemcachedPOSIX on  
  
# Probabilistic counter for the function calls  
MemcachedFunctionCounter on  
  
# Size of the local cache (0 disables it)  
LocalCacheSize 0
```

Frontends setup and configuration

The Available Services on a Heanode are :

"dpm-gsift", "dpm-xrootd", "rfiod" and "lcmdm-dav" (httpd).

The corresponding packages are "dpm-dsi", "dpm-xrootd", "dpm-rfio-server", "lcmdm-dav-server".

Every package is installed via the "dmlite-dpmdisk" metapackage except for the "dpm-xrootd" which should be installed separately.

For each service, there are different configuration to apply

Dmlite Memcache plugin and Memcache server configuration

DPM-GSIFTP

Configure the `/etc/gridftp.conf` as follows:

```
inetd 0
daemon 1
detach 1
chdir 1
fork 1
single 0

cas 1
secure_ipc 1
ipc_auth_mode host
allow_anonymous 0

log_level ERROR,WARN,INFO
log_single /var/log/dpm-gsiftp/gridftp.log
log_transfer /var/log/dpm-gsiftp/dpm-gsiftp.log
disable_usage_stats 1
usage_stats_target usage-stats.globus.org:4810

data_node 0
stripe_blocksize 1048576
stripe_layout 2
stripe_blocksize_locked 0
stripe_layout_locked 0

blocksize 262144
sync_writes 0

port 2811

control_preauth_timeout 120
control_idle_timeout 600
ipc_idle_timeout 600
ipc_connect_timeout 600

banner_terse 0
login_msg "Disk Pool Manager (dmlite)"

load_dsi_module dmlite
use_home_dirs 1
debug 0
```

and the file `/etc/sysconfig/globus` that should be created to contain:

```
conf=/etc/gridftp.conf
confdir=/etc/gridftp.d
export GLOBUS_THREAD_MODEL="pthread"
```

make sure to disable the `globus-gridftp-server`

```
/sbin/chkconfig globus-gridftp-server off
```

DPM-XROOTD

DPM-Xrootd as said is not installed via the metapackage, so it has to be installed separately

Just install the following

```
yum install dpm-xrootd vomsxrd
```


The Daemon has a different configuration in case of SL6/C7

SL6 Configuration (sysconfig based)

The file /etc/sysconfig/xrootd should be modified to contain:

```
XROOTD_USER=dpmmgr
XROOTD_GROUP=dpmmgr
XROOTD_DISK_OPTIONS="-l /var/log/xrootd/xrootd.log -c /etc/xrootd/xrootd-dpmredir.cfg -k fifo"
XROOTD_INSTANCES="  redir"
CMSD_INSTANCES=""
DPM_CONRETRY=0
export DPM_CONRETR
DPM_HOST=<DPM_hostname>
export DPM_HOST
DPNS_CONRETRY=0
export DPNS_CONRETRY
DPNS_HOST=<DPNS_hostname>
export DPNS_HOST
MALLOC_ARENA_MAX=4
export MALLOC_ARENA_MAX
XRD_MAXREDIRECTCOUNT=1
export XRD_MAXREDIRECTCOUNT
DAEMON_COREFILE_LIMIT=unlimited
```

SL7/C7 Configuration (unit file based)

The configuration for the SL7/C7 is done via overriding some xrootd unit file.

Please create the file /etc/systemd/system/xrootd@dpmredir.service.d/override.conf with the content:

```
[Service]
User= dpmmgr
Group= dpmmgr
Environment=DPM_CONRETRY=0
Environment=DPNS_CONRETRY=0
Environment=DPM_HOST=<DPM  HEADNODE FQDN>
Environment=DPNS_CONRETRY=0
Environment=DPNS_HOST=<DPM  HEADNODE FQDN>
Environment=MALLOC_ARENA_MAX=4
Environment=XRD_MAXREDIRECTCOUNT=1
LimitCORE=infinity
Environment=DAEMON_COREFILE_LIMIT=unlimited
```

The rest of the configuration is the same for SL6/C7

The file /etc/xrootd/xrootd-dpmredir.cfg should contain:

```
all.adminpath /var/spool/xrootd
all.pidpath /var/run/xrootd
xrd.network nodnr

if exec xrootd
xrootd.seclib libXrdSec.so
sec.protocol /usr/lib64 gsi -crl:3 -key:/etc/grid-security/dpmmgr/dpmkey.pem -cert:/etc/grid-security/
sec.protocol /usr/lib64 unix
xrootd.export /
ofs.cmslib libXrdDPMFinder.so.3
ofs.osslib libXrdDPMOss.so.3
ofs.authlib libXrdDPMRedirAcc.so.3
ofs.authorize
ofs.forward all
all.role manager
```

```

fi

if exec cmsd
    all.role server
fi

#####
# The following parameters are DPM-specific

dpm.nohv1

if exec xrootd
dpm.xrdserverport 1095

dpm.defaultprefix /dpm/<YOUR DOMAIN>/home

dpm.dmconf /etc/dmlite.conf

dpm.mmreqhost localhost

```

Finally the `/etc/xrootd/dpmxrd-sharedkey.dat` file should be created to contain the xrootd key, which should be the same for all the DPM cluster.

In order to configure Federations (Like FAX or AAA) and xrootd monitoring please refer to the specific DPM Xrootd guide

https://twiki.cern.ch/twiki/bin/view/DPM/DPMComponents_Dpm-Xrootd#Extra_Head_Node_daemons_per_xroo

RFIOD

The file `/etc/sysconfig/rfio` should be configured with:

```

RUN_RFIOD="yes"
DPNS_HOST=<DPNS_hostname>
DPM_HOST=<DPM_hostname>
RFIOLOGFILE=/var/log/rfio/log
RFIO_PORT_RANGE="20000 25000"
OPTIONS="-s1"
GLOBUS_THREAD_MODEL="pthread"
export GLOBUS_THREAD_MODEL

```

LCGDM-DAV

The file `/etc/sysconfig/httpd` should be configured with:

```

HTTPD=/usr/sbin/httpd.event

```

then both files `zgridstite.conf` and `ssl.conf` (under `/etc/httpd/conf.d/`) should be emptied, as the configuration will be provided by `zlcgdm-dav.conf` (`/etc/httpd/conf.d/zlcgdm-dav.conf`).

The installed `zlcgdm-dav.conf` file just need to be updated to configure the NSFlags as follows:

```

NSFlags Write RemoteCopy

```

In addition the following configuration changes are needed in `/etc/httpd/conf/httpd.conf`:

Comment out these lines if present:

```

LoadModule dav_module modules/mod_dav.so

```

```
LoadModule dav_fs_module modules/mod_dav_fs.so
```

and configure

```
KeepAlive On
User dpmmgr
Group dpmmgr
```

On C7 also the following file must be removed:

```
/etc/httpd/conf.modules.d/00-dav.conf
```

N.B Make sure then to change the ownership of the above configuration files to dpmmgr:dpmmgr

Configuring a Disk Node

Core and dmlite installation

The installation of the legacy daemon on a headnode can be performed by installing the following metapackage

```
yum install dmlite-dpmdisk
```

The only dmlite plugins which is needed on a disk nodes is the adapter plugin

The configuration file (/etc/dmlite.conf.d/adapter.conf) should be configured as follows:

```
LoadPlugin plugin_adapter_dpm /usr/lib64/dmlite/plugin_adapter.so
LoadPlugin plugin_fs_rfio /usr/lib64/dmlite/plugin_adapter.so

DpmHost <DPM Headnode FQDN>
NsHost <DPM Headnode FQDN>
# Timeout when connection to the NsHost (in seconds)
ConnectionTimeout 15
# Number of retries when connecting to NsHost (in seconds)
RetryLimit 3
# Interval between retries when connecting to NsHost (in seconds)
RetryInterval 2
# Token generation
TokenPassword <Token password to be identical on the whole cluster>
TokenId ip
TokenLife 1000
```

Frontends setup and configuration

The Available Services on a disknode are :

"dpm-gsiftp", "dpm-xrootd", "rfiod" and "lcgdm-dav" (httpd).

The corresponding packages are "dpm-dsi", "dpm-xrootd", "dpm-rfio-server", "lcgdm-dav-server".

Every package is installed via the "dmlite-dpmdisk" metapackage except for the "dpm-xrootd" which should be installed separately.

For each service, there are different configuration to apply

DPM-GSIFTP

Configure the `/etc/gridftp.conf` as follows:

```
inetd 0
daemon 1
detach 1
chdir 1
fork 1
single 0

cas 1
secure_ipc 1
ipc_auth_mode host
allow_anonymous 0

log_level ERROR,WARN,INFO
log_single /var/log/dpm-gsiftp/gridftp.log
log_transfer /var/log/dpm-gsiftp/dpm-gsiftp.log
disable_usage_stats 1
usage_stats_target usage-stats.globus.org:4810

data_node 0
stripe_blocksize 1048576
stripe_layout 2
stripe_blocksize_locked 0
stripe_layout_locked 0

blocksize 262144
sync_writes 0

port 2811

control_preauth_timeout 120
control_idle_timeout 600
ipc_idle_timeout 600
ipc_connect_timeout 600

banner_terse 0
login_msg "Disk Pool Manager (dmlite)"

load_dsi_module dmlite
use_home_dirs 1
debug 0
```

and the file `/etc/sysconfig/globus` that should be created to contain:

```
conf=/etc/gridftp.conf
confdir=/etc/gridftp.d
export GLOBUS_THREAD_MODEL="pthread"
```

make sure to disable the `globus-gridftp-server`

```
/sbin/chkconfig globus-gridftp-server off
```

DPM-XROOTD

DPM-Xrootd as said is not installed via the metapackage, so it has to be installed separately

Just install the following

```
yum install dpm-xrootd vomsxrd
```

DPM-Xrootd has a different configuration in case of SL6/C7

SL6 Configuration

The file `/etc/sysconfig/xrootd` should be modified to contain:

```
XROOTD_USER=dpmmgr
XROOTD_GROUP=dpmmgr
XROOTD_DISK_OPTIONS="-l /var/log/xrootd/xrootd.log -c /etc/xrootd/xrootd-dpmdisk.cfg -k fifo"
XROOTD_INSTANCES=" disk"
CMSD_INSTANCES=""
DPM_CONRETRY=0
export DPM_CONRETR
DPM_HOST=<DPM_hostname>
export DPM_HOST
DPNS_CONRETRY=0
export DPNS_CONRETRY
DPNS_HOST=<DPNS_hostname>
export DPNS_HOST
MALLOC_ARENA_MAX=4
export MALLOC_ARENA_MAX
XRD_MAXREDIRECTCOUNT=1
export XRD_MAXREDIRECTCOUNT
DAEMON_COREFILE_LIMIT=unlimited
```

SL7/C7 Configuration (unit file based)

The configuration for the SL7/C7 is done via overriding some xrootd unit file.

Please create the file `/etc/systemd/system/xrootd@dpmdisk.service.d/override.conf` with the content:

```
[Service]
User= dpmmgr
Group= dpmmgr
Environment=DPM_CONRETRY=0
Environment=DPNS_CONRETRY=0
Environment=DPM_HOST=<DPM HEADNODE FQDN>
Environment=DPNS_CONRETRY=0
Environment=DPNS_HOST=<DPM HEADNODE FQDN>
Environment=MALLOC_ARENA_MAX=4
Environment=XRD_MAXREDIRECTCOUNT=1
LimitCORE=infinity
Environment=DAEMON_COREFILE_LIMIT=unlimited
```

The rest of the configuration is similar for every OSs.

The file `/etc/xrootd/xrootd-dpmdisk.cfg` should contain:

```
all.adminpath /var/spool/xrootd
all.pidpath /var/run/xrootd
xrd.network nodnr
xrootd.async off

if exec xrootd
xrootd.seclib libXrdSec.so
sec.protocol /usr/lib64 gsi -crl:3 -key:/etc/grid-security/dpmmgr/dpmkey.pem -cert:/etc/grid-security/
sec.protocol /usr/lib64 unix
xrootd.export /
xrd.port 1095
ofs.osslib libXrdDPMOss.so.3
ofs.authlib libXrdDPMDiskAcc.so.3
ofs.authorize
ofs.persist auto hold 0
```

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```
ofs.tpc pgm /usr/bin/xrdcp --server
all.role server
fi

if exec cmsd
all.role server
fi

dpm.nohv1
if exec xrootd
fi
dpm.dmconf /etc/dmlite.conf
```

Finally the `/etc/xrootd/dpmxrd-sharedkey.dat` file should be created to contain the xrootd key, which should be the same for all the DPM cluster.

For the configuration of the Xrootd monitoring plase refer to the specific Xrootd guide:

https://twiki.cern.ch/twiki/bin/view/DPM/DPMComponents_Dpm-Xrootd#VO_central_monitoring_AN1

RFIOD

The file `/etc/sysconfig/rfio` should be configured with:

```
RUN_RFIOD="yes"
DPNS_HOST=<DPNS_hostname>
DPM_HOST=<DPM_hostname>
RFIOLOGFILE=/var/log/rfio/log
RFIO_PORT_RANGE="20000 25000"
OPTIONS="-s1"
GLOBUS_THREAD_MODEL="pthread"
export GLOBUS_THREAD_MODEL
```

LCGDM-DAV

The file `/etc/sysconfig/httpd` should be configured with:

```
HTTPD=/usr/sbin/httpd.event
```

then both files `zgridstite.conf` and `ssl.conf` (under `/etc/httpd/conf.d/`) should be emptied, as the configuration will be provided by `zlcgdm-dav.conf` (`/etc/httpd/conf.d/zlcgdm-dav.conf`).

The installed `zlcgdm-dav.conf` file just need to be updated to configure the `DiskFlags` as follows:

```
DiskFlags Write RemoteCopy
```

In addition the following configuration changes are needed in `/etc/httpd/conf/httpd.conf`:

Comment out these lines if present:

```
LoadModule dav_module modules/mod_dav.so
LoadModule dav_fs_module modules/mod_dav_fs.so
```

and configure

```
KeepAlive On
User dpmmgr
Group dpmmgr
```

On C7 also the following file must be removed:

```
/etc/httpd/conf.modules.d/00-dav.conf
```

N.B Make sure then to change the ownership of the above configuration files to dpmmgr:dpmmgr

Setup trust between "Head Node" and "Disk Server"

Have the disk server trust the DPM daemon (part of the Head Node)

```
# vim /etc/shift.conf
...
RFIOD TRUST <head-node-full-hostname> <head-node-alias>
RFIOD RTRUST <head-node-full-hostname> <head-node-alias>
RFIOD WTRUST <head-node-full-hostname> <head-node-alias>
RFIOD XTRUST <head-node-full-hostname> <head-node-alias>
RFIOD FTRUST <head-node-full-hostname> <head-node-alias>
...
```

Example (for our internal testbed):

```
# vim /etc/shift.conf
...
RFIOD TRUST lxb7606v1.cern.ch dpm-tbed-hn1.cern.ch
RFIOD RTRUST lxb7606v1.cern.ch dpm-tbed-hn1.cern.ch
RFIOD WTRUST lxb7606v1.cern.ch dpm-tbed-hn1.cern.ch
RFIOD XTRUST lxb7606v1.cern.ch dpm-tbed-hn1.cern.ch
RFIOD FTRUST lxb7606v1.cern.ch dpm-tbed-hn1.cern.ch
...
```

Have the DPM/DPNS daemons (Head Node) trust the disk server

N.B. Do this on the Head Node (running the DPM daemon), not the disk server

```
# vim /etc/shift.conf
DPNS TRUST <disk-server-full-hostname>
DPM TRUST <disk-server-full-hostname>
```

Add the filesystems on this disk server to existing pools

N.B Do this on the Head Node (running the DPM daemon), not the disk server

Repeat for each of the file systems you want to add:

```
dpm-addfs --poolname <pool-name> --server <disk-server-full-hostname> --fs <filesystem-name>
```

Example:

```
dpm-addfs --poolname pooldsl --server lxb7606v2.cern.ch --fs /data
```

Enabling and Startup the services

You can now start each of the services you've configured

on SL6:

```
# SL6
```

```
service <service-name> start
```

on C7:

```
systemctl start <service-name>
```

with the exception of the xrootd service which should be started as follows

```
systemctl start xrootd@*
```

-- AndreaManzi - 2017-02-23

This topic: DPM > DpmSetupLegacy

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