



# LHC COMPUTING GRID

## LCG RESOURCE BROKER MANUAL INSTALLATION AND CONFIGURATION

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*Abstract: LCG Resource Broker Manual Installation Guide*

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## REFERENCES

- [1] A. Retico and A. Usai. Lcg grid-mapfile handling on lcg nodes, 2004. <http://www.cern.ch/grid-deployment/gis/release-docs/GMF-index.html>



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## ABSTRACT

Manual steps for the installation and configuration of a LCG RB Node based on a standard (non CERN-like) Red Hat 7.3 installation

Link to this document:

This document is available on the *Grid Deployment* web site

<http://www.cern.ch/grid-deployment/gis/release-docs/RB-index.html>

There you need to select the version tag before downloading the corresponding version of the guide. Other documents labeled with "cvs:", in the *References*, are maintained in txt version into the LCG cvs repository.

They can be downloaded via web by browsing the LCG Deployment home page

<http://www.cern.ch/grid-deployment/>

following then the **CVS Deployment** link on the left side of the page.



---

## 1. PREREQUISITES FOR INSTALLATION

In order to install the RB software you need:

- a working Linux Redhat7.3 on the Resource Broker (This procedure has been tested on a basic RH7.3 and should not differ for more or less equivalent versions of RH. Should it be so please contact us)
- root account on RB machine
- references to software packages to be installed (see below)



---

## 2. RESOURCE BROKER SOFTWARE INSTALLATION

In order to have a running RB the following software must be installed

- RB package
- Other software which a group may rely on

Two different methods are supported for RB software installation

- Centrally managed RB installation using the Debian *apt-get* tool
- Manual RB installation using the Red Hat *rpm* tool.

The first method is simple and straightforward. Node-specific meta-packages define and hide the list of rpms to be installed. Dependencies among rpms, in particular, are easily managed by the *apt-get* tool. This may help if on your site you are running a customized version of Red Hat and you prefer not to solve dependencies manually.

On the other side, the installation using *apt-get* gives to site administrators poor control on installation and on the way the dependencies are solved.

The second method gives full control to site administrators for the installation, because it is based on an explicitly declared set of rpms to be installed on top of Red Hat 7.3

On the other hand, the installation procedure is slower and needs each unmanaged dependency to be manually solved.

### 2.1. RB INSTALLATION USING *apt-get*

in order to install your Resource Broker using *apt-get* please refer to the following document:

<http://www.cern.ch/grid-deployment/gis/aptDB/>

### 2.2. RB INSTALLATION USING *rpm*

All the tools needed for LCG releases are available on the *Grid Deployment* web site

<http://www.cern.ch/grid-deployment/gis/release-docs/RB-index.html>

You can start browsing by selecting the relevant version tag.

Once selected your tag, you will be moved to a page where you can find:

**RB.pdf:** this guide

**RB\_manual\_install\_rpm:** plain full list of those rpms needed to install the RB software on top of a plain RH7.3 installation, whose dependencies are already dealt with.



**RB\_manual\_install\_forced\_rpm:** plain full list of those rpms needed to install the RB software on top of a plain RH7.3 installation, and whose dependencies are NOT dealt with, therefore requiring a forced installation. If this list is not present or void it means that no rpm needs to be forced

**RB\_manual\_install\_wget:** a shell script which downloads, from the LCG mirror site at CERN, the rpms included into the list *RB\_manual\_install\_rpm*

**RB\_manual\_install\_extra\_rpm:** a short list of rpms which RH7.3 does not install by default, but which have been turned out to be required in order to have the SE software installed. This list is provided just for reference, since the rpms from this list are already included into the list *RB\_manual\_install\_rpm*

If any file of the mentioned list is not in the repository it means that it is not applicable within the installation of the current tag. So each further reference to it in this guide can be simply ignored.

All the above mentioned files are grouped in the archive file **RB\_tools.tar.gz**. So they can be easily downloaded and used on target machines.

The provided *RB\_manual\_install\_rpm* includes:

- all the packages which are needed in order to have a production Resource Broker.
- all the general purpose objects (i.e. shared libraries or common applications) which the RB installation needs in order to run and which are not included in the standard operative system. The composition of this group of rpms may vary depending on what is considered "basic OS" at each site, and so it cannot be easily defined in a static way. Given the previous considerations, this part of the provided list may be not exhaustive.

A possible way to use the provided tools is described in the next sections

### Download rpms from the repository in a local directory

- log in as *root* into the node to be installed and copy there the file **RB\_tools.tar.gz**.
- extract the archived files.

```
> gunzip RB_tools.tar.gz  
> tar xvf RB_tools.tar
```

- give execution permissions and run the script *RB\_manual\_install\_wget*, which will then fetch all the rpms required into the subdirectories *RB\_INSTALL* and *RB\_INSTALL\_FORCED*

```
> cd RB_tools  
> chmod u+x RB_manual_install_wget  
> ./RB_manual_install_wget
```





### Install the downloaded rpms

- In the directory **RB.INSTALL**, where the rpms listed in *RB\_manual\_install\_rpm* have been downloaded, run the command

```
> rpm -Uvh "*.rpm"
```

- In the directory **RB.INSTALL\_FORCED** where the rpms listed in *RB\_manual\_install\_forced\_rpm* have been downloaded, run the command

```
> rpm -Uvh --nodeps "*.rpm"
```

Due to possible missing rpms this operation might yield some missing dependencies which have to be analyzed and solved by adding/removing rpms to/from the *RB\_manual\_install\_rpm* list.

Should you prefer to do an upgrade of the RB software already installed at your site instead of a new installation, the necessary steps are listed in the upgrade procedure usually reported in the last section of the RB installation guide.

This procedure, when available, refers to changes occurring between the current version and the previous one. This also means that the procedure is not applicable if the software at your site is more than two tags old.

### 2.3. INSTALLING THE CERTIFICATION AUTHORITY RPMS

As the list and structure of Certification Authorities (CA) accepted by the LCG project can change independently of the middleware releases, the rpm list related to the CAs certificates and URLs has been decoupled from the standard LCG release procedure. You should consult the page

<http://markusw.home.cern.ch/markusw/lcg2CAlist.html>

in order to ascertain what the version number of the latest set of CA rpms is. At time of writing it is 1.6, so the full set of rpms can be downloaded with the following command;

```
> wget -ll -nd -r http://grid-deployment.web.cern.ch/grid-deployment/download/RpmDir/security/index_r1.6.html
```

These rpms should then be installed in the usual way;

```
> rpm -Uvh *.rpm
```

Changes and updates to these settings will be announced on the LCG-Rollout mailing list.



### 3. NTP CLIENT INSTALLATION & CONFIGURATION

A general requirement for the LCG nodes is that they should be synchronized. This requirement may be fulfilled in several ways. If your nodes run under AFS most likely they are already synchronized. Otherwise, you can use the NTP protocol with a time server.

Instructions and examples for a NTP client configuration are provided in this section. If you are not planning to use a time server on your machine you can just skip it.

#### 3.1. NTP SOFTWARE INSTALLATION

In order to install the NTP client, you need the following rpms to be installed:

- ntp
- libcap
- libcap-devel

The following versions of the above said rpms have been proven to work on our OS configuration (the list includes the corresponding links to download sites):

- ntp-4.1.1-1  
<http://grid-deployment.web.cern.ch/grid-deployment/download/RpmDir/release/ntp-4.1.1-1.i386.rpm>
- libcap-devel-1.10-8  
<http://grid-deployment.web.cern.ch/grid-deployment/download/RpmDir/release/libcap-devel-1.10-8.i386.rpm>
- libcap-1.10-8  
<http://grid-deployment.web.cern.ch/grid-deployment/download/RpmDir/release/libcap-1.10-8.i386.rpm>

A complete example of NTP rpms download and installation has been provided in 3.3..

#### 3.2. NTP CONFIGURATION

- Configure the file `/etc/ntp.conf` by adding the lines dealing with your time server configuration such as, for instance:

```
restrict <time_server_IP_address> mask 255.255.255.255 nomodify notrap noquery
server <time_server_name>
```

Additional time servers can be added for better performance results. For each server, the hostname and IP address are required. Then, for each time-server you are using, add a couple of lines similar to the ones shown above into the file `/etc/ntp.conf`.

- Edit the file `/etc/ntp/step-tickers` adding a list of your time server(s) hostname(s), as in the following example:



---

```
137.138.16.69
137.138.17.69
```

---

- If you are running a kernel firewall, you will have to allow inbound communication on the NTP port. If you are using ipchains, you can do this by adding the following to */etc/sysconfig/ipchains*

```
-A input -s <NTP-serverIP-1> -d 0/0 123 -p udp -j ACCEPT
-A input -s <NTP-serverIP-2> -d 0/0 123 -p udp -j ACCEPT
```

Remember that ipchains rules are parsed in order, so ensure that there are no matching REJECT lines preceding those that you add. You can then reload the firewall

```
> /etc/init.d/ipchains restart
```

- Activate the ntpd service with the following commands:

```
> ntpdate <your ntp server name>
> service ntpd start
> chkconfig ntpd on
```

A complete example of NTP configuration has been provided in 3.3.

### 3.3. EXAMPLE OF NTP CLIENT INSTALLATION AND CONFIGURATION

This section reports a complete example of NTP server configuration done in the CERN context.

- install NTP

```
> wget http://grid-deployment.web.cern.ch/grid-deployment/download/RpmDir/release/ntp-4.1.1-1.i386.rpm
> wget http://grid-deployment.web.cern.ch/grid-deployment/download/RpmDir/release/libcap-devel-1.10-8.i386.rpm
> wget http://grid-deployment.web.cern.ch/grid-deployment/download/RpmDir/release/libcap-1.10-8.i386.rpm
> rpm -ivh libcap-1.10-8.i386.rpm libcap-devel-1.10-8.i386.rpm ntp-4.1.1-1.i386.rpm
```

- Configure the file */etc/ntp.conf*:

the lines

```
restrict 137.138.16.69 mask 255.255.255.255 nomodify notrap noquery
server 137.138.16.69
restrict 137.138.17.69 mask 255.255.255.255 nomodify notrap noquery
server 137.138.17.69
```

have been added to the file */etc/ntp.conf*



- Edit the file */etc/ntp/step-tickers*:

the lines

```
137.138.16.69
137.138.17.69
```

have been added to the file */etc/ntp/step-tickers*

- Edit */etc/sysconfig/ipchains* adding

```
-A input -s 137.138.16.69 -d 0/0 123 -p udp -j ACCEPT
-A input -s 137.138.17.69 -d 0/0 123 -p udp -j ACCEPT
```

then reload the firewall

```
> /etc/init.d/ipchains restart
```

- Activate the ntpd server

```
> ntpdate ip-time-1.cern.ch
> service ntpd start
> chkconfig ntpd on
```

- You can check ntpd's status by running the following command

```
> ntpq -p
```

As far as the disk partitioning of the machine at the moment of the RH 7.3 installation is concerned, it is recommended that the */tmp* partition be given as much space as possible!



---

## 4. LCG COMMON CONFIGURATION

### 4.1. SET-UP HOST CERTIFICATES

CE, SE, PROXY, RB nodes require the host certificate/key files before you start their installation. Contact your national certification authority (CA) to understand how to obtain a host certificate and a private key if you do not have them already.

Relevant information on all the trusted CAs can be found in

<http://marianne.in2p3.fr/datagrid/ca/ca-table-ca.html>

which lists the CAs used by edg, from which you should choose a CA close to you.

Once you have obtained a valid certificate, i.e. a file

*hostcert.pem*

containing the machine host certificate and a file

*hostkey.pem*

containing the machine private key, make sure to place the two files into the directory

*/etc/grid-security*

with the following permissions

```
> chmod 400 /etc/grid-security/hostkey.pem
```

```
> chmod 644 /etc/grid-security/hostcert.pem
```

It is IMPORTANT that permissions be set as shown, as otherwise certification errors will occur!!!

### 4.2. CONFIGURE DYNAMIC LINKER RUN-TIME BINDINGS

If not already present, append the following lines to the file */etc/ld.so.conf*

---

```
/opt/gcc-3.2.2/lib  
/opt/globus/lib  
/opt/edg/lib  
/usr/local/lib
```

---

- Run the command:



---

```
> /sbin/ldconfig -v
```

(It produces a huge amount of output)

### 4.3. CREATE TOP-LEVEL EDG CONFIGURATON FILE

This file is parsed by EDG daemons to locate the EDG root directory and various other global properties.

Create and edit the file */etc/sysconfig/edg* as follows:

---

```
# Root directory for EDG software. (mandatory)
# Usual value: /opt/edg
EDG_LOCATION=/opt/edg

# Directory for machine-specific files.
# Usual value: $EDG_LOCATION/var

EDG_LOCATION_VAR=/opt/edg/var

# World writable directory for temporary files. (mandatory)
# Usual value: /tmp
EDG_TMP=/tmp

# The directory containing trusted certificates and CRLs (CERTDIR).
# Usual value: /etc/grid-security/certificates

# Host certificate (X509_USER_CERT) for services which don't have their own.
# Usual value: /etc/grid-security/hostcert.pem

X509_USER_CERT=/etc/grid-security/hostcert.pem

# Host key (X509_USER_KEY) for services which don't have their own.
# Usual value: /etc/grid-security/hostkey.pem

X509_USER_KEY=/etc/grid-security/hostkey.pem

# Location of the grid mapfile (GRIDMAP).
# Usual value: /etc/grid-security/grid-mapfile
```



---

```
GRIDMAP=/etc/grid-security/grid-mapfile
```

```
# Location of the grid map directory for pooled accounts (GRIDMAPDIR).
```

```
# Usual value: /etc/grid-security/gridmapdir
```

```
GRIDMAPDIR=/etc/grid-security/gridmapdir/
```

---

#### 4.4. CREATE TOP-LEVEL GLOBUS CONFIGURATON FILE

Create and edit the file */etc/sysconfig/globus* as follows:

---

```
GLOBUS_LOCATION=/opt/globus
GLOBUS_CONFIG=/etc/globus.conf
GLOBUS_TCP_PORT_RANGE="20000 25000"
```

---

#### 4.5. CREATE GLOBUS CONFIGURATON FILE

Create and edit the file */etc/globus.conf* as follows below, entering the GIIS node at your site (this is for example a Computing Element):

---

```
[common]
GLOBUS_LOCATION=/opt/globus
globus_flavor_name=gcc32dbg
x509_user_cert=/etc/grid-security/hostcert.pem
x509_user_key=/etc/grid-security/hostkey.pem
gridmap=/etc/grid-security/grid-mapfile
gridmapdir=/etc/grid-security/gridmapdir/
[mds]
globus_flavor_name=gcc32dbgpthr
user=edginfo

[mds/gris/provider/edg]

[mds/gris/registration/site]
regname=cerntestlcg2
reghn=<GIIS_NODE>
```



---

```
[gridftp]
log=/var/log/globus-gridftp.log

[gatekeeper]
default_jobmanager=fork
job_manager_path=$GLOBUS_LOCATION/libexec

jobmanagers="fork "

[gatekeeper/fork]
type=fork
job_manager=globus-job-manager
```

---

#### 4.6. LAUNCH GLOBUS INIZIALIZATION SCRIPT

- Define the *GLOBUS\_LOCATION* environment variable (if needed)

```
> export GLOBUS_LOCATION=/opt/globus
```

- Launch setup script

```
> /opt/globus/sbin/globus-initialization.sh
```

This Globus script is meant to be launched on all the LCG nodes, as a general configuration step. Because of this it can yield warning messages as well as some error ones. An example of output to be considered normal in a RB configuration has been produced in Appendix 1.

Since the script produces a huge output it is recommended to re-direct the standard output into a log file:

```
> /opt/globus/sbin/globus-initialization.sh > globus-init.log 2>&1
```

#### 4.7. GSI ACCESS CONTROL LIST (GRID-MAPFILE)

The plain text file

```
/etc/grid-security/grid-mapfile
```

maps a GSI (Grid Security Infrastructure) Credential to a local user's login name.

The information in this file is verified and if needed periodically updated by the cron job

```
> /opt/edg/sbin/edg-mkgridmap
```





---

whose configuration file is

*/opt/edg/etc/edg-mkgridmap.conf*

If this in turn is not properly configured, the relevant information of the authorised users will not be fetched or updated, resulting in the node not working properly!!!

Instructions on how to edit `edg-mkgridmap.conf` can be found in [1].



## 5. REPLICA MANAGER CONFIGURATION

The `edg-replica-manager-config` RPM installs the `edg-replica-manager-configure` script into the `/opt/edg/sbin` directory. This script can be used to automatically generate the default configuration file.

Before running the script, the file

```
/opt/edg/etc/edg-replica-manager/edg-replica-manager.conf.values
```

should be manually edited as input file to the script

```
/opt/edg/sbin/edg-replica-manager-configure
```

which automatically writes the local configuration parameters into the `edg-replica-manager.conf` file.

So the two step to be done are outline below.

### 5.1. EDIT THE LOCAL CONFIGURATION FILE

The file

```
/opt/edg/etc/edg-replica-manager/edg-replica-manager.conf.values
```

as above said, should be manually edited. Since it is also created by the `edg-replica-manager-config` rpm it is advisable to rename it (e.g. `edg-replica-manager.conf.values_local`) so that possible upgrades of the rpm do not overwrite the already existing file.

The file `edg-replica-manager.conf.values` looks like

---

```
@EDG.LOCATION@|<path>|location of edg middleware
@LOCALDOMAIN@|<domainname>|the local domain
@DEFAULT.SE@|< SE hostname>|the host of the close SE
@DEFAULT.CE@|< CE hostname>|the host of the close CE
@RLS.MODE@|<LrcOnly OR WithRli>|The mode the RLS should be run in. LrcOnly or WithRli
@INFOSERVICE@|<info-provider hostname>|The info provider to use. It can be Stub, MDS or RGMA
@STUBFILE@|<filepath>|The properties file for the static file 'info service'
@MDS.HOST@|<hostname-top-giis>|The host of the MDS info provide
@MDS.PORT@|<portnumber>|The port of the MDS info provider
@ROS.FAILURE@|false|Fail if no ROS is available
@CONF.GCC@|<_gcc3_2_2 OR empty>|The gcc suffix as used on the build box (empty for 2.95, _gcc3_2_2 for 3.2.)
@IGNORE.PREFIX@|true|If true, the lfn and guid prefix will not be passed to the
catalogs
@GRIDFTP.DCAU@|false|Does GridFTP use Data Channel Authentication (DCAU)
@GRIDFTP.STREAMS.SMALL@|1|The default number of stream to use for a small file
@GRIDFTP.STREAMS.BIG@|3|The default number of stream to use for a big file
@GRIDFTP.FILESIZES.THRESHOLD@|100|The Threshold (in MB) above which a file to transfer is considered "big"
```

---

The parameters have the following meaning:

<**EDG.LOCATION**>: location of edg middleware, normally set to `/opt/edg`, it must match with the previous definition in 4.2

<**LOCALDOMAIN**>: your domain name (site-dependent)

<**DEFAULT.SE**>: (site-dependent)



---

<**DEFAULT.CE**>: (site-dependent)

<**RLS.MODE**>: Replica Catalog type: the implementation of the replica catalog interface. Available choices are: - LrcOnly – a single LRC per VO - WithRli – a full RLS deployed

<**INFOSERVICE**>: The implementation of the Information Service Interface. The following choices are available:

<**Stub**>: a local configuration file specified by STUBFILE is used instead of an information service

<**RGMA**>: R-GMA is contacted for all information service requests

<**MDS**>: MDS.HOST is contacted on MDS.PORT for all information service requests (this is the correct choice for lcg2)

<**STUBFILE**>: used if INFOSERVICE is set to "Stub"

<**MDS.HOST**>: (site-dependent) value used if INFOSERVICE is set to "MDS". It should be a BDII node. If your site owns a BDII use its hostname.

If you have a reference site, ask them for indications or send a message to the "LCG-ROLLOUT@cclrclsv.RL.AC.U" mailing list

<**MDS.PORT**>: used if INFOSERVICE is set to "MDS" (see above)

<**ROS.FAILURE**>: Failure if ROS is NOT available. This may be set to 'false' if you want the replica manager not to complain if ROS is unavailable (this is the correct choice for lcg2)

<**CONF.GCC**>: It is the gcc suffix to be concatenated to the name of the JNI library interfacing to gridFTP in the native implementation of the latter one. This dynamic library will be loaded from the classpath. Possible values are:

- empty – for 2.95

- \_gcc3\_2\_2 – for 3.2 (this is the correct choice for lcg2)

**IGNORE.PREFIX:** This flag, if set to 'true', allows the use of the new RLS, which ignores the prefixes. It should always be set to 'true'

**GRIDFTP.DCAU:** flag to indicate whether GridFTP uses Data Channel Authentication (DCAU) or not. In current implementation should be set to 'false'

**GRIDFTP.STREAMS.SMALL:** Default number of streams to use for the transfer of a 'small' file

**GRIDFTP.STREAMS.BIG:** Default number of streams to use for the transfer of a 'big' file

**GRIDFTP.FILESIZE.THRESHOLD:** The Threshold (given in MB) above which a file to transfer is considered to be "big"



---

# Example of layout for file

*/opt/edg/etc/edg-replica-manager/edg-replica-manager.conf.values\_local*

---

```
@EDG.LOCATION@|/opt/edg|location of edg the directory
@LOCALDOMAIN@|cern.ch|the local domain
@DEFAULT.SE@|adc0033.cern.ch|the host of the close SE
@DEFAULT.CE@|adc0029.cern.ch|the host of the close CE
@INFOSERVICE@|MDS|The info provider to use. It can be Stub, MDS or RGMA
@RLS.MODE@|LrcOnly|The mode the RLS should be run in. LrcOnly or WithRli
@STUBFILE@||The properties file for the static file 'info service'
@MDS.HOST@|adc0031.cern.ch|The host of the MDS info provider
@MDS.PORT@|2170|The port of the MDS info provider
@ROS.FAILURE@|false|Fail if no ROS is available
@CONF.GCC@|_gcc3_2_2|The gcc suffix as used on the build box (empty for 2.95, _gcc3_2_2 for 3.2.)
@IGNORE.PREFIX@|true|If true, the lfn and guid prefix will not be passed to the
catalogs
@GRIDFTP.DCAU@|false|Does GridFTP use Data Channel Authentication (DCAU)
@GRIDFTP.STREAMS.SMALL@|1|The default number of stream to use for a small file
@GRIDFTP.STREAMS.BIG@|3|The default number of stream to use for a big file
@GRIDFTP.FILESIZETHRESHOLD@|100|The Threshold (in MB) above which a file to transfer is considered "big"
```

---

## 5.2. RUN THE CONFIGURATION SCRIPT

Run (the `--verbose` flag is optional)

```
> /opt/edg/sbin/edg-replica-manager-configure /opt/edg/etc/edg-replica-manager/edg-replica-manager.conf.values_local [--verbose]
```

The file

*/opt/edg/var/etc/edg-replica-manager/edg-replica-manager.conf*

is modified accordingly as a result and should be checked to make sure it was edited properly!.



---

## 6. POOL ACCOUNTS

Pool accounts with the following characteristics have to be created on the RB.

### 6.1. LCG GROUPS

For every VO a corresponding group has to be created. For example for alice, atlas, cms, lhcb and dteam the following groups have to be created: alice atlas cms lhcb dteam

What follows is a production example

```
> groupadd -g 2688 dteam
> groupadd -g 1307 atlas
> groupadd -g 1470 lhcb
> groupadd -g 1399 cms
> groupadd -g 1395 alice
```

---

## 7. POOL USER NAMES

For every VO a corresponding set of users (with also a corresponding home directory in "/home") should be created.

Referring to the example of alice, atlas, cms, lhcb and dteam:

- Users of group alice:

```
alice001
...
...
alice050
```

- Users of group atlas:

```
atlas001
...
...
atlas050
```

- Users of group cms:

```
cms001
...
...
cms050
```

- Users of group lhcb:

```
lhcb001
...
...
lhcb050
```

- Users of group dteam:

```
dteam001
...
...
dteam050
```



What follows is a full production example:

```
useradd -c "mapped user for group ID 2688" -u 18946 -g 2688 dteamsgm
useradd -c "mapped user for group ID 2688" -u 18118 -g 2688 dteam001
useradd -c "mapped user for group ID 2688" -u 18119 -g 2688 dteam002
useradd -c "mapped user for group ID 2688" -u 18120 -g 2688 dteam003
useradd -c "mapped user for group ID 2688" -u 18146 -g 2688 dteam004
useradd -c "mapped user for group ID 2688" -u 18151 -g 2688 dteam005
useradd -c "mapped user for group ID 2688" -u 18153 -g 2688 dteam006
useradd -c "mapped user for group ID 2688" -u 18166 -g 2688 dteam007
useradd -c "mapped user for group ID 2688" -u 18178 -g 2688 dteam008
useradd -c "mapped user for group ID 2688" -u 18181 -g 2688 dteam009
useradd -c "mapped user for group ID 2688" -u 18182 -g 2688 dteam010
useradd -c "mapped user for group ID 2688" -u 18184 -g 2688 dteam011
useradd -c "mapped user for group ID 2688" -u 18187 -g 2688 dteam012
useradd -c "mapped user for group ID 2688" -u 18190 -g 2688 dteam013
useradd -c "mapped user for group ID 2688" -u 18191 -g 2688 dteam014
useradd -c "mapped user for group ID 2688" -u 18192 -g 2688 dteam015
useradd -c "mapped user for group ID 2688" -u 18234 -g 2688 dteam016
useradd -c "mapped user for group ID 2688" -u 18239 -g 2688 dteam017
useradd -c "mapped user for group ID 2688" -u 18262 -g 2688 dteam018
useradd -c "mapped user for group ID 2688" -u 18263 -g 2688 dteam019
useradd -c "mapped user for group ID 2688" -u 18264 -g 2688 dteam020
useradd -c "mapped user for group ID 2688" -u 18673 -g 2688 dteam021
useradd -c "mapped user for group ID 2688" -u 18678 -g 2688 dteam022
useradd -c "mapped user for group ID 2688" -u 18699 -g 2688 dteam023
useradd -c "mapped user for group ID 2688" -u 18700 -g 2688 dteam024
useradd -c "mapped user for group ID 2688" -u 18701 -g 2688 dteam025
useradd -c "mapped user for group ID 2688" -u 18702 -g 2688 dteam026
useradd -c "mapped user for group ID 2688" -u 18703 -g 2688 dteam027
useradd -c "mapped user for group ID 2688" -u 18704 -g 2688 dteam028
useradd -c "mapped user for group ID 2688" -u 18705 -g 2688 dteam029
useradd -c "mapped user for group ID 2688" -u 18738 -g 2688 dteam030
useradd -c "mapped user for group ID 2688" -u 18739 -g 2688 dteam031
useradd -c "mapped user for group ID 2688" -u 18742 -g 2688 dteam032
useradd -c "mapped user for group ID 2688" -u 18743 -g 2688 dteam033
useradd -c "mapped user for group ID 2688" -u 18745 -g 2688 dteam034
useradd -c "mapped user for group ID 2688" -u 18746 -g 2688 dteam035
useradd -c "mapped user for group ID 2688" -u 18747 -g 2688 dteam036
useradd -c "mapped user for group ID 2688" -u 18748 -g 2688 dteam037
useradd -c "mapped user for group ID 2688" -u 18750 -g 2688 dteam038
useradd -c "mapped user for group ID 2688" -u 18751 -g 2688 dteam039
useradd -c "mapped user for group ID 2688" -u 18752 -g 2688 dteam040
useradd -c "mapped user for group ID 2688" -u 18756 -g 2688 dteam041
```



```
useradd -c "mapped user for group ID 2688" -u 18757 -g 2688 dteam042
useradd -c "mapped user for group ID 2688" -u 18758 -g 2688 dteam043
useradd -c "mapped user for group ID 2688" -u 18759 -g 2688 dteam044
useradd -c "mapped user for group ID 2688" -u 18760 -g 2688 dteam045
useradd -c "mapped user for group ID 2688" -u 18765 -g 2688 dteam046
useradd -c "mapped user for group ID 2688" -u 18766 -g 2688 dteam047
useradd -c "mapped user for group ID 2688" -u 18770 -g 2688 dteam048
useradd -c "mapped user for group ID 2688" -u 18771 -g 2688 dteam049
useradd -c "mapped user for group ID 2688" -u 18774 -g 2688 dteam050
useradd -c "mapped user for group ID 1307" -u 10761 -g 1307 atlas001
useradd -c "mapped user for group ID 1307" -u 10762 -g 1307 atlas002
useradd -c "mapped user for group ID 1307" -u 10763 -g 1307 atlas003
useradd -c "mapped user for group ID 1307" -u 10765 -g 1307 atlas004
useradd -c "mapped user for group ID 1307" -u 10843 -g 1307 atlas005
useradd -c "mapped user for group ID 1307" -u 10860 -g 1307 atlas006
useradd -c "mapped user for group ID 1307" -u 10900 -g 1307 atlas007
useradd -c "mapped user for group ID 1307" -u 10905 -g 1307 atlas008
useradd -c "mapped user for group ID 1307" -u 10929 -g 1307 atlas009
useradd -c "mapped user for group ID 1307" -u 10953 -g 1307 atlas010
useradd -c "mapped user for group ID 1307" -u 10977 -g 1307 atlas011
useradd -c "mapped user for group ID 1307" -u 10985 -g 1307 atlas012
useradd -c "mapped user for group ID 1307" -u 10998 -g 1307 atlas013
useradd -c "mapped user for group ID 1307" -u 11044 -g 1307 atlas014
useradd -c "mapped user for group ID 1307" -u 11090 -g 1307 atlas015
useradd -c "mapped user for group ID 1307" -u 11098 -g 1307 atlas016
useradd -c "mapped user for group ID 1307" -u 11110 -g 1307 atlas017
useradd -c "mapped user for group ID 1307" -u 11232 -g 1307 atlas018
useradd -c "mapped user for group ID 1307" -u 11302 -g 1307 atlas019
useradd -c "mapped user for group ID 1307" -u 11357 -g 1307 atlas020
useradd -c "mapped user for group ID 1307" -u 18420 -g 1307 atlas021
useradd -c "mapped user for group ID 1307" -u 18421 -g 1307 atlas022
useradd -c "mapped user for group ID 1307" -u 18426 -g 1307 atlas023
useradd -c "mapped user for group ID 1307" -u 18428 -g 1307 atlas024
useradd -c "mapped user for group ID 1307" -u 18429 -g 1307 atlas025
useradd -c "mapped user for group ID 1307" -u 18431 -g 1307 atlas026
useradd -c "mapped user for group ID 1307" -u 18432 -g 1307 atlas027
useradd -c "mapped user for group ID 1307" -u 18433 -g 1307 atlas028
useradd -c "mapped user for group ID 1307" -u 18435 -g 1307 atlas029
useradd -c "mapped user for group ID 1307" -u 18467 -g 1307 atlas030
useradd -c "mapped user for group ID 1307" -u 18468 -g 1307 atlas031
useradd -c "mapped user for group ID 1307" -u 18470 -g 1307 atlas032
useradd -c "mapped user for group ID 1307" -u 18497 -g 1307 atlas033
useradd -c "mapped user for group ID 1307" -u 18500 -g 1307 atlas034
useradd -c "mapped user for group ID 1307" -u 18501 -g 1307 atlas035
```





```
useradd -c "mapped user for group ID 1307" -u 18506 -g 1307 atlas036
useradd -c "mapped user for group ID 1307" -u 18515 -g 1307 atlas037
useradd -c "mapped user for group ID 1307" -u 18516 -g 1307 atlas038
useradd -c "mapped user for group ID 1307" -u 18517 -g 1307 atlas039
useradd -c "mapped user for group ID 1307" -u 18520 -g 1307 atlas040
useradd -c "mapped user for group ID 1307" -u 18521 -g 1307 atlas041
useradd -c "mapped user for group ID 1307" -u 18522 -g 1307 atlas042
useradd -c "mapped user for group ID 1307" -u 18523 -g 1307 atlas043
useradd -c "mapped user for group ID 1307" -u 18524 -g 1307 atlas044
useradd -c "mapped user for group ID 1307" -u 18525 -g 1307 atlas045
useradd -c "mapped user for group ID 1307" -u 18535 -g 1307 atlas046
useradd -c "mapped user for group ID 1307" -u 18538 -g 1307 atlas047
useradd -c "mapped user for group ID 1307" -u 18541 -g 1307 atlas048
useradd -c "mapped user for group ID 1307" -u 18542 -g 1307 atlas049
useradd -c "mapped user for group ID 1307" -u 18543 -g 1307 atlas050
useradd -c "mapped user for group ID 1307" -u 18943 -g 1307 atlassgm
useradd -c "mapped user for group ID 1470" -u 12238 -g 1470 lhcb001
useradd -c "mapped user for group ID 1470" -u 12244 -g 1470 lhcb002
useradd -c "mapped user for group ID 1470" -u 12304 -g 1470 lhcb003
useradd -c "mapped user for group ID 1470" -u 12317 -g 1470 lhcb004
useradd -c "mapped user for group ID 1470" -u 12327 -g 1470 lhcb005
useradd -c "mapped user for group ID 1470" -u 12368 -g 1470 lhcb006
useradd -c "mapped user for group ID 1470" -u 12409 -g 1470 lhcb007
useradd -c "mapped user for group ID 1470" -u 12485 -g 1470 lhcb008
useradd -c "mapped user for group ID 1470" -u 12534 -g 1470 lhcb009
useradd -c "mapped user for group ID 1470" -u 12535 -g 1470 lhcb010
useradd -c "mapped user for group ID 1470" -u 12550 -g 1470 lhcb011
useradd -c "mapped user for group ID 1470" -u 12635 -g 1470 lhcb012
useradd -c "mapped user for group ID 1470" -u 12636 -g 1470 lhcb013
useradd -c "mapped user for group ID 1470" -u 12638 -g 1470 lhcb014
useradd -c "mapped user for group ID 1470" -u 12672 -g 1470 lhcb015
useradd -c "mapped user for group ID 1470" -u 12682 -g 1470 lhcb016
useradd -c "mapped user for group ID 1470" -u 12686 -g 1470 lhcb017
useradd -c "mapped user for group ID 1470" -u 12733 -g 1470 lhcb018
useradd -c "mapped user for group ID 1470" -u 12774 -g 1470 lhcb019
useradd -c "mapped user for group ID 1470" -u 12817 -g 1470 lhcb020
useradd -c "mapped user for group ID 1470" -u 18265 -g 1470 lhcb021
useradd -c "mapped user for group ID 1470" -u 18269 -g 1470 lhcb022
useradd -c "mapped user for group ID 1470" -u 18278 -g 1470 lhcb023
useradd -c "mapped user for group ID 1470" -u 18279 -g 1470 lhcb024
useradd -c "mapped user for group ID 1470" -u 18284 -g 1470 lhcb025
useradd -c "mapped user for group ID 1470" -u 18285 -g 1470 lhcb026
useradd -c "mapped user for group ID 1470" -u 18328 -g 1470 lhcb027
useradd -c "mapped user for group ID 1470" -u 18329 -g 1470 lhcb028
```



```
useradd -c "mapped user for group ID 1470" -u 18330 -g 1470 lhcb029
useradd -c "mapped user for group ID 1470" -u 18335 -g 1470 lhcb030
useradd -c "mapped user for group ID 1470" -u 18352 -g 1470 lhcb031
useradd -c "mapped user for group ID 1470" -u 18353 -g 1470 lhcb032
useradd -c "mapped user for group ID 1470" -u 18371 -g 1470 lhcb033
useradd -c "mapped user for group ID 1470" -u 18374 -g 1470 lhcb034
useradd -c "mapped user for group ID 1470" -u 18376 -g 1470 lhcb035
useradd -c "mapped user for group ID 1470" -u 18378 -g 1470 lhcb036
useradd -c "mapped user for group ID 1470" -u 18379 -g 1470 lhcb037
useradd -c "mapped user for group ID 1470" -u 18380 -g 1470 lhcb038
useradd -c "mapped user for group ID 1470" -u 18382 -g 1470 lhcb039
useradd -c "mapped user for group ID 1470" -u 18383 -g 1470 lhcb040
useradd -c "mapped user for group ID 1470" -u 18390 -g 1470 lhcb041
useradd -c "mapped user for group ID 1470" -u 18392 -g 1470 lhcb042
useradd -c "mapped user for group ID 1470" -u 18393 -g 1470 lhcb043
useradd -c "mapped user for group ID 1470" -u 18403 -g 1470 lhcb044
useradd -c "mapped user for group ID 1470" -u 18404 -g 1470 lhcb045
useradd -c "mapped user for group ID 1470" -u 18405 -g 1470 lhcb046
useradd -c "mapped user for group ID 1470" -u 18414 -g 1470 lhcb047
useradd -c "mapped user for group ID 1470" -u 18415 -g 1470 lhcb048
useradd -c "mapped user for group ID 1470" -u 18416 -g 1470 lhcb049
useradd -c "mapped user for group ID 1470" -u 18417 -g 1470 lhcb050
useradd -c "mapped user for group ID 1470" -u 18945 -g 1470 lhcb0sgm
useradd -c "mapped user for group ID 1399" -u 11410 -g 1399 cms001
useradd -c "mapped user for group ID 1399" -u 11456 -g 1399 cms002
useradd -c "mapped user for group ID 1399" -u 11480 -g 1399 cms003
useradd -c "mapped user for group ID 1399" -u 11518 -g 1399 cms004
useradd -c "mapped user for group ID 1399" -u 11591 -g 1399 cms005
useradd -c "mapped user for group ID 1399" -u 11598 -g 1399 cms006
useradd -c "mapped user for group ID 1399" -u 11611 -g 1399 cms007
useradd -c "mapped user for group ID 1399" -u 11614 -g 1399 cms008
useradd -c "mapped user for group ID 1399" -u 11622 -g 1399 cms009
useradd -c "mapped user for group ID 1399" -u 11704 -g 1399 cms010
useradd -c "mapped user for group ID 1399" -u 11720 -g 1399 cms011
useradd -c "mapped user for group ID 1399" -u 11731 -g 1399 cms012
useradd -c "mapped user for group ID 1399" -u 11755 -g 1399 cms013
useradd -c "mapped user for group ID 1399" -u 11780 -g 1399 cms014
useradd -c "mapped user for group ID 1399" -u 11815 -g 1399 cms015
useradd -c "mapped user for group ID 1399" -u 11817 -g 1399 cms016
useradd -c "mapped user for group ID 1399" -u 11830 -g 1399 cms017
useradd -c "mapped user for group ID 1399" -u 11907 -g 1399 cms018
useradd -c "mapped user for group ID 1399" -u 12037 -g 1399 cms019
useradd -c "mapped user for group ID 1399" -u 12158 -g 1399 cms020
useradd -c "mapped user for group ID 1399" -u 18547 -g 1399 cms021
```



```
useradd -c "mapped user for group ID 1399" -u 18550 -g 1399 cms022
useradd -c "mapped user for group ID 1399" -u 18555 -g 1399 cms023
useradd -c "mapped user for group ID 1399" -u 18559 -g 1399 cms024
useradd -c "mapped user for group ID 1399" -u 18561 -g 1399 cms025
useradd -c "mapped user for group ID 1399" -u 18562 -g 1399 cms026
useradd -c "mapped user for group ID 1399" -u 18564 -g 1399 cms027
useradd -c "mapped user for group ID 1399" -u 18565 -g 1399 cms028
useradd -c "mapped user for group ID 1399" -u 18567 -g 1399 cms029
useradd -c "mapped user for group ID 1399" -u 18576 -g 1399 cms030
useradd -c "mapped user for group ID 1399" -u 18577 -g 1399 cms031
useradd -c "mapped user for group ID 1399" -u 18578 -g 1399 cms032
useradd -c "mapped user for group ID 1399" -u 18589 -g 1399 cms033
useradd -c "mapped user for group ID 1399" -u 18590 -g 1399 cms034
useradd -c "mapped user for group ID 1399" -u 18591 -g 1399 cms035
useradd -c "mapped user for group ID 1399" -u 18592 -g 1399 cms036
useradd -c "mapped user for group ID 1399" -u 18594 -g 1399 cms037
useradd -c "mapped user for group ID 1399" -u 18595 -g 1399 cms038
useradd -c "mapped user for group ID 1399" -u 18597 -g 1399 cms039
useradd -c "mapped user for group ID 1399" -u 18598 -g 1399 cms040
useradd -c "mapped user for group ID 1399" -u 18599 -g 1399 cms041
useradd -c "mapped user for group ID 1399" -u 18632 -g 1399 cms042
useradd -c "mapped user for group ID 1399" -u 18637 -g 1399 cms043
useradd -c "mapped user for group ID 1399" -u 18638 -g 1399 cms044
useradd -c "mapped user for group ID 1399" -u 18639 -g 1399 cms045
useradd -c "mapped user for group ID 1399" -u 18640 -g 1399 cms046
useradd -c "mapped user for group ID 1399" -u 18642 -g 1399 cms047
useradd -c "mapped user for group ID 1399" -u 18669 -g 1399 cms048
useradd -c "mapped user for group ID 1399" -u 18671 -g 1399 cms049
useradd -c "mapped user for group ID 1399" -u 18672 -g 1399 cms050
useradd -c "mapped user for group ID 1399" -u 18944 -g 1399 cmssgm
useradd -c "mapped user for group ID 1395" -u 10417 -g 1395 alice001
useradd -c "mapped user for group ID 1395" -u 10418 -g 1395 alice002
useradd -c "mapped user for group ID 1395" -u 10420 -g 1395 alice003
useradd -c "mapped user for group ID 1395" -u 10454 -g 1395 alice004
useradd -c "mapped user for group ID 1395" -u 10472 -g 1395 alice005
useradd -c "mapped user for group ID 1395" -u 10511 -g 1395 alice006
useradd -c "mapped user for group ID 1395" -u 10562 -g 1395 alice007
useradd -c "mapped user for group ID 1395" -u 10567 -g 1395 alice008
useradd -c "mapped user for group ID 1395" -u 10618 -g 1395 alice009
useradd -c "mapped user for group ID 1395" -u 10625 -g 1395 alice010
useradd -c "mapped user for group ID 1395" -u 10636 -g 1395 alice011
useradd -c "mapped user for group ID 1395" -u 10671 -g 1395 alice012
useradd -c "mapped user for group ID 1395" -u 10673 -g 1395 alice013
useradd -c "mapped user for group ID 1395" -u 10689 -g 1395 alice014
```



```
useradd -c "mapped user for group ID 1395" -u 10690 -g 1395 alice015
useradd -c "mapped user for group ID 1395" -u 10715 -g 1395 alice016
useradd -c "mapped user for group ID 1395" -u 10718 -g 1395 alice017
useradd -c "mapped user for group ID 1395" -u 10724 -g 1395 alice018
useradd -c "mapped user for group ID 1395" -u 10725 -g 1395 alice019
useradd -c "mapped user for group ID 1395" -u 10726 -g 1395 alice020
useradd -c "mapped user for group ID 1395" -u 14554 -g 1395 alice021
useradd -c "mapped user for group ID 1395" -u 14699 -g 1395 alice022
useradd -c "mapped user for group ID 1395" -u 14888 -g 1395 alice023
useradd -c "mapped user for group ID 1395" -u 14895 -g 1395 alice024
useradd -c "mapped user for group ID 1395" -u 15075 -g 1395 alice025
useradd -c "mapped user for group ID 1395" -u 15111 -g 1395 alice026
useradd -c "mapped user for group ID 1395" -u 15286 -g 1395 alice027
useradd -c "mapped user for group ID 1395" -u 16219 -g 1395 alice028
useradd -c "mapped user for group ID 1395" -u 16961 -g 1395 alice029
useradd -c "mapped user for group ID 1395" -u 17357 -g 1395 alice030
useradd -c "mapped user for group ID 1395" -u 17403 -g 1395 alice031
useradd -c "mapped user for group ID 1395" -u 17544 -g 1395 alice032
useradd -c "mapped user for group ID 1395" -u 17579 -g 1395 alice033
useradd -c "mapped user for group ID 1395" -u 17580 -g 1395 alice034
useradd -c "mapped user for group ID 1395" -u 17582 -g 1395 alice035
useradd -c "mapped user for group ID 1395" -u 17583 -g 1395 alice036
useradd -c "mapped user for group ID 1395" -u 17605 -g 1395 alice037
useradd -c "mapped user for group ID 1395" -u 17615 -g 1395 alice038
useradd -c "mapped user for group ID 1395" -u 17648 -g 1395 alice039
useradd -c "mapped user for group ID 1395" -u 17693 -g 1395 alice040
useradd -c "mapped user for group ID 1395" -u 17701 -g 1395 alice041
useradd -c "mapped user for group ID 1395" -u 17714 -g 1395 alice042
useradd -c "mapped user for group ID 1395" -u 17888 -g 1395 alice043
useradd -c "mapped user for group ID 1395" -u 17983 -g 1395 alice044
useradd -c "mapped user for group ID 1395" -u 17994 -g 1395 alice045
useradd -c "mapped user for group ID 1395" -u 17997 -g 1395 alice046
useradd -c "mapped user for group ID 1395" -u 17998 -g 1395 alice047
useradd -c "mapped user for group ID 1395" -u 18041 -g 1395 alice048
useradd -c "mapped user for group ID 1395" -u 18054 -g 1395 alice049
useradd -c "mapped user for group ID 1395" -u 18055 -g 1395 alice050
useradd -c "mapped user for group ID 1395" -u 18941 -g 1395 alicesgm
```

## 7.1. EXPERIMENT SOFTWARE MANAGER CONFIGURATION

For each VO group defined in 6. a special account to handle experiment software has to be created.

For example for alice, atlas, cms, lhcb and dteam the list of SGM user to be created would be:



---

alicesgm  
atlassgm  
cmssgm  
lhcbsgm  
dteamsgm

---

The following lines are a production example

---

```
useradd -c "mapped user for group ID 2688" -u 18946 -g 2688 dteamsgm
useradd -c "mapped user for group ID 1307" -u 18943 -g 1307 atlassgm
useradd -c "mapped user for group ID 1470" -u 18945 -g 1470 lhcbsgm
useradd -c "mapped user for group ID 1399" -u 18944 -g 1399 cmssgm
useradd -c "mapped user for group ID 1395" -u 18941 -g 1395 alicesgm
```

---

## 7.2. RB SPECIAL USERS AND GROUPS

### Groups

edguser:x:995:  
sshd:x:74:  
edginfo:x:999:

Notice that reported above are the entries appearing in the file */etc/group*

### Users

User *edguser* :

The user *edguser* belongs to the group *edguser* as well as *atlas*, *alice*, *cms*, *lhcb* and *dteam*

The user *edguser* has also a home directory in */home*.

Notice that many of the servers which run within the RB node are owned by the user *edguser* and so its presence is FUNDAMENTAL!!!

User *sshd*:

The user *sshd* belongs to the group *sshd*



---

The user *sshd* has NOT a home directory in */home*. Rather, its home directory is */var/empty/sshd* instead. Also notice that the default shell for this user should be */bin/false*, i.e. no login is allowed under the *sshd* user.

The user *sshd* is normally created by newer versions of *opelssl* and so is not created in a standard red hat 7.3.

User *edginfo*:

The user *edginfo* belongs to the group *edginfo*

The user *edginfo* has NOT a home directory in */home*. Rather, its home directory is */opt/edg/var* instead.

Notice also that *edginfo* is not strictly required for the correct functioning of the node.

Reported below are the standard steps required to create all the relevant non general groups and users.

```
> groupadd -g 995 edguser
> groupadd -g 74 sshd
> groupadd -g 999 edginfo

> useradd -M -u 74 -g 74 -s /bin/false -d /var/empty/sshd sshd
> useradd -u 995 -g 995 -s /bin/bash edguser
> useradd -M -u 999 -g 999 -s /bin/bash -d /opt/edg/var edginfo

> gpasswd -a edguser dteam
> gpasswd -a edguser atlas
> gpasswd -a edguser lhcb
> gpasswd -a edguser cms
> gpasswd -a edguser alice
```

### 7.3. GLOBUS "GRIDMAPDIR" PATCH

- Create the directory */etc/grid-security/gridmapdir*

```
> mkdir /etc/grid-security/gridmapdir
```

Now it is IMPORTANT to do

```
> chown root:edguser /etc/grid-security/gridmapdir
```

NOTICE however that the user and group ownerships of the files contained in the *gridmapdir* directory, e.g. *atlas001*, MUST be root, despite the fact that the *gridmapdir*'s group ID is *edguser*!



- For every Pool user name, a corresponding empty file with the same name should be created, e.g.

```
> touch /etc/grid-security/gridmapdir/atlas001
....
> touch /etc/grid-security/gridmapdir/dteam050
```

**WARNING:** Be careful not to create any other files than the pool user ones.

Namely, the "sgm" users used by the experiment software management system DO NOT need to be associated to files in the */etc/grid-security/gridmapdir* directory (see 7.1. below). The following is a full production example:

```
touch alice001
touch alice002
touch alice003
touch alice004
touch alice005
touch alice006
touch alice007
touch alice008
touch alice009
touch alice010
touch alice011
touch alice012
touch alice013
touch alice014
touch alice015
touch alice016
touch alice017
touch alice018
touch alice019
touch alice020
touch alice021
touch alice022
touch alice023
touch alice024
touch alice025
touch alice026
touch alice027
touch alice028
touch alice029
touch alice030
touch alice031
touch alice032
touch alice033
touch alice034
```



---

touch alice035  
touch alice036  
touch alice037  
touch alice038  
touch alice039  
touch alice040  
touch alice041  
touch alice042  
touch alice043  
touch alice044  
touch alice045  
touch alice046  
touch alice047  
touch alice048  
touch alice049  
touch alice050  
touch atlas001  
touch atlas002  
touch atlas003  
touch atlas004  
touch atlas005  
touch atlas006  
touch atlas007  
touch atlas008  
touch atlas009  
touch atlas010  
touch atlas011  
touch atlas012  
touch atlas013  
touch atlas014  
touch atlas015  
touch atlas016  
touch atlas017  
touch atlas018  
touch atlas019  
touch atlas020  
touch atlas021  
touch atlas022  
touch atlas023  
touch atlas024  
touch atlas025  
touch atlas026  
touch atlas027  
touch atlas028





---

touch atlas029  
touch atlas030  
touch atlas031  
touch atlas032  
touch atlas033  
touch atlas034  
touch atlas035  
touch atlas036  
touch atlas037  
touch atlas038  
touch atlas039  
touch atlas040  
touch atlas041  
touch atlas042  
touch atlas043  
touch atlas044  
touch atlas045  
touch atlas046  
touch atlas047  
touch atlas048  
touch atlas049  
touch atlas050  
touch cms001  
touch cms002  
touch cms003  
touch cms004  
touch cms005  
touch cms006  
touch cms007  
touch cms008  
touch cms009  
touch cms010  
touch cms011  
touch cms012  
touch cms013  
touch cms014  
touch cms015  
touch cms016  
touch cms017  
touch cms018  
touch cms019  
touch cms020  
touch cms021  
touch cms022



---

touch cms023  
touch cms024  
touch cms025  
touch cms026  
touch cms027  
touch cms028  
touch cms029  
touch cms030  
touch cms031  
touch cms032  
touch cms033  
touch cms034  
touch cms035  
touch cms036  
touch cms037  
touch cms038  
touch cms039  
touch cms040  
touch cms041  
touch cms042  
touch cms043  
touch cms044  
touch cms045  
touch cms046  
touch cms047  
touch cms048  
touch cms049  
touch cms050  
touch dteam001  
touch dteam002  
touch dteam003  
touch dteam004  
touch dteam005  
touch dteam006  
touch dteam007  
touch dteam008  
touch dteam009  
touch dteam010  
touch dteam011  
touch dteam012  
touch dteam013  
touch dteam014  
touch dteam015  
touch dteam016



---

touch dteam017  
touch dteam018  
touch dteam019  
touch dteam020  
touch dteam021  
touch dteam022  
touch dteam023  
touch dteam024  
touch dteam025  
touch dteam026  
touch dteam027  
touch dteam028  
touch dteam029  
touch dteam030  
touch dteam031  
touch dteam032  
touch dteam033  
touch dteam034  
touch dteam035  
touch dteam036  
touch dteam037  
touch dteam038  
touch dteam039  
touch dteam040  
touch dteam041  
touch dteam042  
touch dteam043  
touch dteam044  
touch dteam045  
touch dteam046  
touch dteam047  
touch dteam048  
touch dteam049  
touch dteam050  
touch lhcb001  
touch lhcb002  
touch lhcb003  
touch lhcb004  
touch lhcb005  
touch lhcb006  
touch lhcb007  
touch lhcb008  
touch lhcb009  
touch lhcb010

---

```
touch lhcb011
touch lhcb012
touch lhcb013
touch lhcb014
touch lhcb015
touch lhcb016
touch lhcb017
touch lhcb018
touch lhcb019
touch lhcb020
touch lhcb021
touch lhcb022
touch lhcb023
touch lhcb024
touch lhcb025
touch lhcb026
touch lhcb027
touch lhcb028
touch lhcb029
touch lhcb030
touch lhcb031
touch lhcb032
touch lhcb033
touch lhcb034
touch lhcb035
touch lhcb036
touch lhcb037
touch lhcb038
touch lhcb039
touch lhcb040
touch lhcb041
touch lhcb042
touch lhcb043
touch lhcb044
touch lhcb045
touch lhcb046
touch lhcb047
touch lhcb048
touch lhcb049
touch lhcb050
```

- Edit the crontab

```
> crontab -e
```



---

adding the line

```
0 5 * * * /opt/edg/sbin/lcg-expiregridmapdir.pl -v 1>>/var/log/lcg-expiregridmapdir.log 2>&1
```



---

## 8. GRIS CONFIGURATION

This section deals with the configuration of the Gris which publishes information about the Resource Broker, rendering it visible within the Grid.

### 8.1. INFO-PROVIDER.CONF

Create the directory `/opt/edg/var/info/`

```
> mkdir /opt/edg/var/info
```

Create and edit the file `/opt/edg/var/info/info-provider.conf` as follows

---

```
EDG_LOCATION=/opt/edg
GRID_INFO_USER=
REP_MET_PRESENT=no
REP_LOC_PRESENT=no
REP_OPT_PRESENT=no
SE_PRESENT=yes
```

---

### 8.2. LCG-INFO-WRAPPER

Create and edit the file `/opt/lcg/libexec/lcg-info-wrapper` as follows

---

```
#!/bin/sh
/opt/lcg/libexec/lcg-info-generic /opt/lcg/var/lcg-info-generic.conf
```

---

after which the command

```
> chmod a+wrx /opt/lcg/libexec/lcg-info-wrapper
```

should be launched.

### 8.3. INFORMATION PROVIDER

The information provider needs to be configured. In order to do so create and edit

`/opt/lcg/var/lcg-info-generic.conf` as follows:

---

```
ldif_file=/opt/lcg/var/lcg-info-static.ldif
generic_script=/opt/lcg/libexec/lcg-info-generic
wrapper_script=/opt/lcg/libexec/lcg-info-wrapper
template=/opt/lcg/etc/GlueService.template

dn: GlueServiceURI=gram://<NODE_NAME>:7772,Mds-vo-name=local,o=grid
GlueServiceAccessPointURL: gram://<NODE_NAME>:7772
GlueServiceType: ResourceBroker
GlueServicePrimaryOwnerName: LCG
GlueServicePrimaryOwnerContact: grid-testbed-managers@host.invalid
```

---



---

```
GlueServiceHostingOrganization: <HOSTING_ORG>
GlueServiceMajorVersion: 1
GlueServicePatchVersion: 1
GlueCEAccessControlBaseRule: <VIRTUAL_ORGANIZATION_1>
GlueCEAccessControlBaseRule: <VIRTUAL_ORGANIZATION_N>
GlueServiceInformationServiceURL: ldap://<NODE_NAME>:2135/mds-vo-name=local,o=grid
GlueServiceStatus: running
```

---

where <NODE\_NAME> is the Resource Broker Node full Name; <HOSTING\_ORG> is the Hosting Organization Name; <VIRTUAL\_ORGANIZATION\_1> to <VIRTUAL\_ORGANIZATION\_N> is the set of Virtual Organizations supported (so for every VO a corresponding line should be entered).

**WARNING: PLEASE MAKE SURE THAT THE END OF LINE CHARACTER IS PRESENT AT THE END OF THE LAST LINE. IF NOT THE INFORMATION WILL BE BADLY PROCESSED AND IN THE END DISREGARDED!!!**

A production example follows:

---

```
ldif_file=/opt/lcg/var/lcg-info-static.ldif
generic_script=/opt/lcg/libexec/lcg-info-generic
wrapper_script=/opt/lcg/libexec/lcg-info-wrapper
template=/opt/lcg/etc/GlueService.template

dn: GlueServiceURI=gram://lxshare0410.cern.ch:7772,Mds-vo-name=local,o=grid
GlueServiceAccessPointURL: gram://lxshare0410.cern.ch:7772
GlueServiceType: ResourceBroker
GlueServicePrimaryOwnerName: LCG
GlueServicePrimaryOwnerContact: mailto:hep-project-grid-cern-testbed-managers@cern.ch
GlueServiceHostingOrganization: CERN-TEST-LCG2
GlueServiceMajorVersion: 1
GlueServicePatchVersion: 1
GlueServiceAccessControlRule: alice
GlueServiceAccessControlRule: atlas
GlueServiceAccessControlRule: cms
GlueServiceAccessControlRule: lhcb
GlueServiceAccessControlRule: dteam
GlueServiceAccessControlRule: sixt
GlueServiceInformationServiceURL: ldap://lxshare0410.cern.ch:2135/mds-vo-name=local,o=grid
GlueServiceStatus: running
```

---

The script *lcg-info-generic-config* should then be launched in order to create the right configuration:

```
> /opt/lcg/sbin/lcg-info-generic-config lcg-info-generic.conf
```

Notice that the file */opt/lcg/var/lcg-info-static.ldif* will be created as a result. This file SHOULD NOT BE EDITED MANUALLY.

#### 8.4. INFO PROVIDER INITIALIZATION SCRIPT

This step is required so as to define which Information Provider should be used by the GRIS. In order to do so launch the setup script

```
> /opt/edg/sbin/edg-info-provider-setup
```

and after that the globus initialization script

```
> /opt/globus/sbin/globus-initialization.sh > globus-init.log 2>&1
```



---

## 8.5. START THE INFORMATION SERVICE

```
> /sbin/chkconfig globus-mds on
> service globus-mds start
```

## 8.6. GRIS AND GIIS TEST

Test the GRIS and GIIS as follows:

```
> ldapsearch -h <RB-Hostname> -p 2135 -b "mds-vo-name=local,o=grid" -x
> ldapsearch -h <GIIS Node> -p 2135 -b "mds-vo-name=<your-registration-name>,o=grid" -x
```

### NOTE CAREFULLY:

In order for the Resource Broker to be *visible* the BDII has to contain the information relative to the GIIS node (e.g. a computing element) which also requires that the RB node be entered in the file */etc/globus* of the GIIS node itself.

Also notice that should there be a sizeable time difference between the RB and BDII, the latter one will not update the RB information, which is therefore lost.





---

## 9. RESOURCE BROKER SPECIFIC CONFIGURATION

### 9.1.

Proceed through the following steps as shown, to insure the correct ownership/permissions are set.

WARNING: Should any of the following steps be overlooked, the corresponding servers might not run properly and make any job submission fail as consequence!!!

#### Work Load Manager

In /var

```
> mkdir /var/edgwl
```

In /var/edgwl

```
> mkdir SandboxDir
> mkdir -p networkserver/log
> chmod g+w SandboxDir
> mkdir -p workload_manager/log
> mkdir -p jobcontrol/cond
```

In /var

```
> chown -R edguser:edguser edgwl
```

This last instruction is fundamental in setting the correct ownership!!!

#### **/opt/edg/**

Create the directory

```
/opt/edg/var/etc/profile.d
```

with

```
> mkdir -p /opt/edg/var/etc/profile.d
```

Copy from the directory

```
/opt/edg/etc/profile.d
```

the following files:



---

- *edg-wl.csh*

- *edg-wl.sh*

- *edg-wl-config.sh*

into the directory

*/opt/edg/var/etc/profile.d*

```
> cd /opt/edg/etc/profile.d
```

```
> cp edg-wl.csh edg-wl.sh edg-wl-config.sh /opt/edg/var/etc/profile.d/
```

In */opt/edg/var*

```
> mkdir run
```

```
> mkdir log
```

### **Condor**

```
> mkdir -p /opt/condor/var/condor/log/GridLogs
```

In */opt/condor/var/condor/*

```
> mkdir spool
```

Now it is IMPORTANT to do:

In */opt/condor/var/*

```
> chown -R edguser:edguser condor
```

## **9.2. WORK LOAD CONFIG FILE**

Create and edit the file */opt/edg/etc/edg-wl.conf* accordingly. The template of the file follows below. The file is standard and typically only your BDII node needs to be entered, i.e. <YOUR\_BDII\_NODE> in the *II\_Contact* variable.

---

```
[
  Common = [
    DGUser = "${EDG_WL_USER}";
    HostProxyFile = "${EDG_WL_TMP}/networkserver/ns.proxy";
    UseCacheInsteadOfGris = true;
  ];
  JobController = [
    CondorSubmit = "${CONDORG_INSTALL_PATH}/bin/condor_submit";
```



```
CondorRemove = "${CONDORG_INSTALL_PATH}/bin/condor_rm";
CondorQuery = "${CONDORG_INSTALL_PATH}/bin/condor_q";
CondorSubmitDag = "${CONDORG_INSTALL_PATH}/bin/condor_submit_dag";
CondorRelease = "${CONDORG_INSTALL_PATH}/bin/condor_release";

SubmitFileDir = "${EDG_WL_TMP}/jobcontrol/submit";
OutputFileDir = "${EDG_WL_TMP}/jobcontrol/condorio";
Input = "${EDG_WL_TMP}/jobcontrol/queue.fl";
LockFile = "${EDG_WL_TMP}/jobcontrol/lock";
LogFile = "${EDG_WL_TMP}/jobcontrol/log/events.log";
ExternalLogFile = "${EDG_WL_TMP}/jobcontrol/log/external.log";

LogLevel = 5;

ContainerRefreshThreshold = 1000;
];
LogMonitor = [
    JobsPerCondorLog = 1000;
    LockFile = "${EDG_WL_TMP}/logmonitor/lock";
    LogFile = "${EDG_WL_TMP}/logmonitor/log/events.log";
    LogLevel = 5;
    ExternalLogFile = "${EDG_WL_TMP}/logmonitor/log/external.log";
    MainLoopDuration = 5;

    CondorLogDir = "${EDG_WL_TMP}/logmonitor/CondorG.log";
    CondorLogRecycleDir = "${EDG_WL_TMP}/logmonitor/CondorG.log/recycle";

    MonitorInternalDir = "${EDG_WL_TMP}/logmonitor/internal";
    IdRepositoryName = "irepository.dat";

    AbortedJobsTimeout = 600;
];
NetworkServer = [
    II_Port = 2170;
    Gris_Port = 2135;
    II_Timeout = 30;
    Gris_Timeout = 20;
    II_DN = "mds-vo-name=local, o=grid";
    Gris_DN = "mds-vo-name=local, o=grid";
    II_Contact = "<YOUR_BDII_NODE>";

    ListeningPort = 7772;
```



```
MasterThreads = 8;
DispatcherThreads = 10;
SandboxStagingPath = "${EDG_WL_TMP}/SandboxDir";

LogFile = "${EDG_WL_TMP}/networkserver/log/events.log";
LogLevel = 5;
BacklogSize = 16;
EnableQuotaManagement = false;
MaxInputSandboxSize = 10000000;
EnableDynamicQuotaAdjustment = false;
QuotaAdjustmentAmount = 10000;
QuotaInsensibleDiskPortion = 2.0;
];
WorkloadManager = [
    PipeDepth = 1;
    NumberOfWorkerThreads = 1;
    DispatcherType = "filelist";
    Input = "${EDG_WL_TMP}/workload_manager/input.fl";
    LogLevel = 6;
    LogFile = "${EDG_WL_TMP}/workload_manager/log/events.log";

    MaxRetryCount = 10;
];
]
```

---

### 9.3. CONDOR CONFIGURATION

The file

*/opt/condor/etc/condor.conf*

should be created and edited accordingly, as shown below:

---

```
#
# PART 1
#
CONDOR_HOST = $(FULL_HOSTNAME)

RELEASE_DIR = /opt/condor
LOCAL_DIR = /opt/condor/var/condor

CONDOR_ADMIN = \"hep-project-grid-cern-testbed-managers@cern.ch\"
MAIL = /bin/mail

UID_DOMAIN = $(FULL_HOSTNAME)
FILESYSTEM_DOMAIN = $(FULL_HOSTNAME)

#
# PART 2
#
```



```
DAEMON_LIST = MASTER, SCHEDD

FLOCK_NEGOTIATOR_HOSTS = $(FLOCK_TO)
FLOCK_COLLECTOR_HOSTS = $(FLOCK_TO)

HOSTALLOW_ADMINISTRATOR = $(CONDOR_HOST)
HOSTALLOW_OWNER = $(FULL_HOSTNAME), $(HOSTALLOW_ADMINISTRATOR)
HOSTALLOW_READ = *
HOSTALLOW_WRITE = $(FULL_HOSTNAME), $(GLIDEIN_SITES)
HOSTALLOW_NEGOTIATOR = $(NEGOTIATOR_HOST)
HOSTALLOW_NEGOTIATOR_SCHEDD = $(NEGOTIATOR_HOST), $(FLOCK_NEGOTIATOR_HOSTS)
HOSTALLOW_WRITE_COLLECTOR = $(HOSTALLOW_WRITE), $(FLOCK_FROM)
HOSTALLOW_WRITE_STARTD = $(HOSTALLOW_WRITE), $(FLOCK_FROM)
HOSTALLOW_READ_COLLECTOR = $(HOSTALLOW_READ), $(FLOCK_FROM)
HOSTALLOW_READ_STARTD = $(HOSTALLOW_READ), $(FLOCK_FROM)

LOCK = $(LOG)

MAX_SCHEDD_LOG = 64000000
SCHEDD_DEBUG = D_COMMAND
MAX_GRIDMANAGER_LOG = 64000000
GRIDMANAGER_DEBUG = D_COMMAND
MAX_COLLECTOR_LOG = 64000000
COLLECTOR_DEBUG = D_COMMAND
MAX_NEGOTIATOR_LOG = 64000000
NEGOTIATOR_DEBUG = D_MATCH
MAX_NEGOTIATOR_MATCH_LOG = 64000000
MAX_SHADOW_LOG = 64000000

#
# PART 3
#

MINUTE = 60
HOUR = (60 * $(MINUTE))
StateTimer = (CurrentTime - EnteredCurrentState)
ActivityTimer = (CurrentTime - EnteredCurrentActivity)
ActivationTimer = (CurrentTime - JobStart)
LastCkpt = (CurrentTime - LastPeriodicCheckpoint)

STANDARD = 1
PVM = 4
VANILLA = 5
IsPVM = (JobUniverse == $(PVM))
IsVANILLA = (JobUniverse == $(VANILLA))
IsSTANDARD = (JobUniverse == $(STANDARD))
NonCondorLoadAvg = (LoadAvg - CondorLoadAvg)
BackgroundLoad = 0.3
HighLoad = 0.5
StartIdleTime = 15 * $(MINUTE)
ContinueIdleTime = 5 * $(MINUTE)
MaxSuspendTime = 10 * $(MINUTE)
MaxVacateTime = 10 * $(MINUTE)
KeyboardBusy = (KeyboardIdle < $(MINUTE))
ConsoleBusy = (ConsoleIdle < $(MINUTE))
CPU_Idle = ($(NonCondorLoadAvg) <= $(BackgroundLoad))
CPU_Busy = ($(NonCondorLoadAvg) >= $(HighLoad))
BigJob = (ImageSize >= (50 * 1024))
MediumJob = (ImageSize >= (15 * 1024) && ImageSize < (50 * 1024))

SmallJob = (ImageSize < (15 * 1024))
JustCPU = ($(CPU_Busy) && $(KeyboardBusy) == False)
MachineBusy = ($(CPU_Busy) || $(KeyboardBusy))

#
# PART 4
#

DISABLE_AUTH_NEGOTIATION = true

LOG = $(LOCAL_DIR)/log
SPOOL = $(LOCAL_DIR)/spool
EXECUTE = $(LOCAL_DIR)/execute
BIN = $(RELEASE_DIR)/bin
LIB = $(RELEASE_DIR)/lib
SBIN = $(RELEASE_DIR)/sbin
HISTORY = $(SPOOL)/history

MASTER_LOG = $(LOG)/MasterLog
SCHEDD_LOG = $(LOG)/SchedLog
GRIDMANAGER_LOG = $(LOG)/GridLogs/GridmanagerLog.$(USERNAME)
SHADOW_LOG = $(LOG)/ShadowLog
COLLECTOR_LOG = $(LOG)/CollectorLog
NEGOTIATOR_LOG = $(LOG)/NegotiatorLog
```



---

```
NEGOTIATOR_MATCH_LOG = $(LOG)/MatchLog
SHADOW_LOCK = $(LOCK)/ShadowLock
RESERVED_DISK = 5
MASTER = $(SBIN)/condor_master
SCHEDD = $(SBIN)/condor_schedd
NEGOTIATOR = $(SBIN)/condor_negotiator
COLLECTOR = $(SBIN)/condor_collector
MASTER_ADDRESS_FILE = $(LOG)/.master_address
PREEN = $(SBIN)/condor_preen
PREEN_ARGS = -m -r
SHADOW = $(SBIN)/condor_shadow
SHADOW_PVM = $(SBIN)/condor_shadow.pvm
GRIDMANAGER = $(SBIN)/condor_gridmanager
GAHP = $(SBIN)/gahp_server
SCHEDD_ADDRESS_FILE = $(LOG)/.schedd_address
SHADOW_SIZE_ESTIMATE = 1800
SHADOW_RENICE_INCREMENT = 10
QUEUE_SUPER_USERS = root, condor
PVMD = $(SBIN)/condor_pvmd
PVMGS = $(SBIN)/condor_pvmgs
DEFAULT_UNIVERSE = globus
CRED_MIN_TIME_LEFT = 120
VALID_SPOOL_FILES = job_queue.log, job_queue.log.tmp, history, Accountant.log, Accountantnew.log
INVALID_LOG_FILES = core
GLIDEIN_SERVER_NAME = gridftp.cs.wisc.edu
GLIDEIN_SERVER_DIR = /p/condor/public/binaries/gli dein
AUTHENTICATION_METHODS = CLAIMTOBE
ENABLE_GRID_MONITOR = TRUE
GRID_MONITOR = $(SBIN)/grid_monitor.sh
GRIDMANAGER_MINIMUM_PROXY_TIME = 600
GRIDMANAGER_MAX_SUBMITTED_JOBS_PER_RESOURCE = 32000
GRIDMANAGER_MAX_PENDING_SUBMITS_PER_RESOURCE = 5
GRIDMANAGER_MAX_PENDING_REQUESTS = 1000
GRIDMANAGER_GAHP_CALL_TIMEOUT = 900
GRID_MONITOR_HEARTBEAT_TIMEOUT = 300
GRID_MONITOR_RETRY_DURATION = 31536000
```

---

#### 9.4. CONFIGURE THE MYSQL DATABASE FOR LBSERVER

```
> /sbin/chkconfig mysql on
> /etc/rc.d/init.d/mysql start
> mysqladmin password <YOUR_PASSWORD>
> mysqladmin -p create lbserver20
```

This command will require the password to be entered, e.g. "datagrid", as defined above!

Enter password: \*\*\*\*\*

```
> mysql -p lbserver20 < /opt/edg/etc/server.sql
```

This command will require the password to be entered, e.g. "datagrid" as defined above!

Enter password: \*\*\*\*\*



---

```
> mysql -p lbserver20
```

This command will require the password to be entered, e.g. "datagrid" as defined above!

Enter password: \*\*\*\*\*

After which mysql session will be started! Within the mysql session do the following:

```
> mysql> grant all on lbserver20.* to lbserver@localhost \g
> mysql> \qj
```



---

## 10. SERVERS START UP

### 10.1. FTPD

```
> /sbin/chkconfig edg-wl-ftp on  
> /etc/rc.d/init.d/edg-wl-ftp start
```

after which the following command should be always issued:

```
> /etc/rc.d/init.d/edg-wl-ftp status
```

to check that the server is properly running!!!

### 10.2. L&B SERVER

```
> /sbin/chkconfig edg-wl-lbserver on  
> /etc/rc.d/init.d/edg-wl-lbserver start
```

After which the following command should be always issued:

```
> /etc/rc.d/init.d/edg-wl-lbserver status
```

to check that the server is properly running!!!

### 10.3. NETWORK SERVER

```
> /sbin/chkconfig edg-wl-ns on  
> /etc/rc.d/init.d/edg-wl-ns start
```

After which the following command should be always issued:

```
> /etc/rc.d/init.d/edg-wl-ns status
```

to check that the server is properly running!!!

### 10.4. WORKLOAD MANAGER

```
> /sbin/chkconfig edg-wl-wm on  
> /etc/rc.d/init.d/edg-wl-wm start
```

After which the following command should be always issued:

```
> /etc/rc.d/init.d/edg-wl-wm status
```

to check that the server is properly running!!!





---

## 10.5. JOBCONTROLLER DAEMON

```
> /sbin/chkconfig edg-wl-jc on
> /etc/rc.d/init.d/edg-wl-jc start
```

After which the following command should be always issued:

```
> /etc/rc.d/init.d/edg-wl-jc status
```

to check that the server is properly running!!!

Notice that the Job controller relies on the file

*/opt/condor/etc/condor.conf*

being created and properly edited (see 7.2)!!!

## 10.6. LOGMONITOR DAEMON

```
> /sbin/chkconfig edg-wl-lm on
> /etc/rc.d/init.d/edg-wl-lm start
```

After which the following command should be always issued:

```
> /etc/rc.d/init.d/edg-wl-lm status
```

to check that the server is properly running!!!

## 10.7. LOCALLOGGER SERVER

```
> /sbin/chkconfig edg-wl-locallogger on
> /etc/rc.d/init.d/edg-wl-locallogger start
```

After which the following command should be always issued:

```
> /etc/rc.d/init.d/edg-wl-locallogger status
```

to check that the server is properly running!!!



## 11. FABRIC MONITORING BY GRIDICE

The CE, SE, and RB LCG nodes produce data for the GridICE monitoring system. The data are then sent to a collector server node which will then be queried by the LCG central GridICE monitoring service. If you are running agents you should also run a GridICE collector server to collect information from your agents.

In the default LCG-2 configuration the SE node runs the GridICE collector node. In Section 11.1. you can find the configuration of agents while section 11.2. deals with the configuration details for the GridICE collector server.

If you are doing a default LCG-2 configuration you should apply section 11.2. just to the SE.

Before going forward with configuration, please assure the following RPMs to be installed (they should have been distributed with the node RPMs).

*edg-fabricMonitoring edt\_sensor*

### 11.1. SET-UP OF GRIDICE AGENTS

In order to enable GridICE agent on a LCG node:

- Create and configure the file `/opt/edg/var/etc/edg-fmon-agent.conf` as follows:

---

```
# Sensor file for edg-fmonagent
MSA

Transport

UDP
  Server <GridICE-collector-hostname>
  Port 12409
  FilterMetrics KeepOnly
    11001
    11011
    11021
    11101
    11202
    11013
    11022
    11031
    11201
    10100
    10101
    10102
    10103
    10104
    10105

Sensors

  edtproc
    CommandLine /opt/edt/monitoring/bin/GLUESensorLinuxProc
    MetricClasses
      edt.uptime
      edt.cpu
      edt.memory
      edt.disk
      edt.network
```



```
        edt.ctxint
        edt.swap
        edt.processes
        edt.sockets
        edt.cpuinfo
        edt.os
        edt.alive
        edt.regfiles

sensor1
  CommandLine $(EDG_LOCATION)/libexec/edg-fmon-sensor-systemCheck
  MetricClasses
    executeScript

Metrics
  11001
    MetricClass edt.uptime
  11011
    MetricClass edt.cpu
  11021
    MetricClass edt.memory
  11101
    MetricClass edt.disk
  11202
    MetricClass edt.network
    Parameters
      interface      eth0
  11013
    MetricClass edt.ctxint
  11022
    MetricClass edt.swap
  11031
    MetricClass edt.processes
  11201
    MetricClass edt.sockets
  10100
    MetricClass edt.cpuinfo
  10101
    MetricClass edt.os
  10102
    MetricClass edt.alive
  10103
    MetricClass edt.regfiles
  10104
    MetricClass executeScript
    Parameters
      command        /opt/edt/monitoring/bin/CheckDaemon.pl --cfg /opt/edt/monitoring/etc/gridice-role.cfg
  10105
    MetricClass executeScript
    Parameters
      command        /opt/edt/monitoring/bin/PoolDir.pl

Samples
  verylowfreq
    Timing 3600 0
    Metrics
      10100
      10101
  lowfreq
    Timing 1800 0
    Metrics
      11001
  proc0
    Timing 30 0
    Metrics
      10102
  proc1
    Timing 60 0
    Metrics
      11011
      11021
      11101
      11202
      11013
      11022
      11031
      11201
  proc2
    Timing 300 0
    Metrics
      10103
```



---

```
proc3          10105
               Timing 120 0
               Metrics
               10104
```

---

**WARNING:** be very careful not to use <SPACE> characters to indent lines in this configuration file. Use <TAB> (or nothing) instead. The edg-fmon-agent does not allow spaces at the beginning of a row in the configuration file.

The parameter <GridICE-collector-hostname> is the complete hostname of the node that runs the GridICE collector server and publishes the data on the information system. The collector node will have to run a plain GRIS for this.

The information is sent to the collector node via UDP (port 12409)

Should you need to set up a GridICE collector node at your site use refer to section 11.1..

- start the GridICE agent

```
> chkconfig edg-fmon-agent on
> service edg-fmon-agent start
```

## 11.2. SET-UP OF A GRIDICE COLLECTOR SERVER

The Fabric Monitoring server can be installed on every node running a plain GRIS (e.g. Computing Element, Storage Element)

### Fabric Monitoring server configuration

- Create (if needed) the directory

```
/opt/edg/var/etc
```

```
> mkdir /opt/edg/var/etc
```

- Create and edit as follows the file

```
/opt/edg/var/etc/edg-fmon-server.conf
```

---

```
SERVER_SPOOLDIR=/var/fmonServer
SERVER_PORT=12409
MR_SOAP_PORT=12411
```

---

- Start the Fabric Monitoring server

```
> chkconfig edg-fmon-server on
> service edg-fmon-server start
```



---

### **Start the GridICE Information service**

```
> chkconfig gridice-mds on
> service gridice-mds start
```

### **Configure extra info in the standard GRIS**

- Edit the file `/etc/globus.conf` and insert the line

```
[mds/gris/provider/gridice]
```

between the line

```
[mds/gris/provider/edg]
```

and the line

```
[mds/gris/registration/site]
```

- Re-start the standard MDS

```
> service globus-mds restart
```

### **Set up Cron Table**

The repository is cleaned daily : data is kept for last 5 days only

- Add the service to the crontab

```
> crontab -e
```

This will allow the editing of the crontable with the default editor, after which the following line has to be added:

```
43 1 * * * /opt/edg/sbin/edg-fmon-cleanspool &> /dev/null
```



---

## 12. RGMA CLIENT INSTALLATION

In what follows the installation and configuration of a standard RGMA producer is described. The producer component takes care of publishing information following the general RGMA architecture and as such should be installed in all those machines which need to be monitored (RGMA can in principle be used as an information system as well, however for the purpose of this document this will not be considered).

### 12.1. RGMA CONFIGURATION

#### **ld.so.conf**

Add to the file */etc/ld.so.conf* the following lines

---

```
/opt/edg/lib
/opt/gcc-3.2.2/lib
```

---

#### **Environmental Variables**

Define the following environmental variables

```
> export RGMA_PROPS=/opt/edg/var/edg-rgma
> export EDG_LOCATION_VAR=/opt/edg/var
> export EDG_TMP=/tmp
> export EDG_LOCATION=/opt/edg
```

Also MAKE SURE that */opt/edg/bin* is in the *PATH*

#### **File */etc/sysconfig/edg***

Create and edit the file

*/etc/sysconfig/edg*

as

---

```
# Root directory for EDG software. (mandatory)
# Usual value: /opt/edg
EDG_LOCATION=/opt/edg

# Directory for machine-specific files.
# Usual value: $EDG_LOCATION/var

EDG_LOCATION_VAR=/opt/edg/var
```



---

```
# World writable directory for temporary files. (mandatory)
# Usual value: /tmp
EDG_TMP=/tmp

# The directory containing trusted certificates and CRLs (CERTDIR).
# Usual value: /etc/grid-security/certificates

# Host certificate (X509_USER_CERT) for services which don't have their own.
# Usual value: /etc/grid-security/hostcert.pem

# Host key (X509_USER_KEY) for services which don't have their own.
# Usual value: /etc/grid-security/hostkey.pem

# Location of the grid mapfile (GRIDMAP).
# Usual value: /etc/grid-security/grid-mapfile

# Location of the grid map directory for pooled accounts (GRIDMAPDIR).
# Usual value: /etc/grid-security/gridmapdir
```

---

### Directory edg-rgma

Create the directory (if it does not exist already)

```
/opt/edg/var/edg-rgma
```

```
> mkdir -p /opt/edg/var/edg-rgma
```

Notice that this step is also performed by *edg-rgma-config* (See 12.2.)

### RGMA Default Values

Create and edit the file

```
/opt/edg/var/edg-rgma/rgma-defaults
```

---

```
RGMA_PROPS=/opt/edg/var/edg-rgma
CATALINA_HOME=/var/tomcat4
JUNIT_JAR=_undefined_
```



---

```
LOG4J_JAR=/usr/share/java/log4j.jar
MYSQL_JAR=/usr/share/java/mm.mysql-2.0.14.jar
NETLOGGER_JAR=/usr/share/java/netlogger.jar
PREVAYLER_JAR=/usr/share/java/prevayler.jar
EDG_TRUST_SERVER_JAR=/opt/edg/share/java/edg-java-security-trustmanager.jar
EDG_AUTHORIZ_SERVER_JAR=/opt/edg/share/java/edg-java-security-authorization.jar
EDG_TRUST_CLIENT_JAR=/opt/edg/share/java/edg-java-security-trustmanager-client.jar
BOUNCYCASTLE_JAR=/usr/share/java/bcprov-jdk14.jar
JAVACC_HOME=_undefined_
TEXDOCLET_JAR=_undefined_
INFO_JAR=/opt/edg/share/java/info.jar
SQLUTIL_JAR=/opt/edg/share/java/sqlutil.jar
rgma_c_API=_undefined_
RGMA_RPM_VERSION=3.4.31
GCC_VERSION=
SERLOC=<MON_NODE_NAME>
REGLOC=<REGISTRY_NODE_NAME>
SECURE=n
RegistryHosts="<REGISTRY_NODE_NAME>"
RGMA_ROOT=/opt
```

---

where <MON\_NODE\_NAME> is the MON BOX machine name and <REGISTRY\_NODE\_NAME> is the REGISTRY machine name, whose default value is *lgic01.gridpp.rl.ac.uk* in the current lcg version.

## 12.2. RGMA CONFIGURATION CREATION

Launch the following script to configure rgma

```
> /opt/edg/sbin/edg-rgma-config -q
```





---

## 13. CRON TABLE CONFIGURATION

The following production example of crontab should be taken as reference:

---

```
PATH=/sbin:/bin:/usr/sbin:/usr/bin

26 1,7,13,19 * * * /opt/edg/sbin/edg-mkgridmap --output=/etc/grid-security/grid

26 1,7,13,19 * * * /opt/edg/etc/cron/edg-fetch-crl-cron
26 2,8,14,20 * * * /sbin/service edg-wl-locallogger proxy
26 2,8,14,20 * * * /sbin/service edg-wl-lbserver proxy
26 2,8,14,20 * * * /sbin/service edg-wl-proxyrenewal proxy
26 2,8,14,20 * * * /sbin/service edg-wl-ns proxy
26 */1 * * 1-6 /opt/edg/libexec/edg-wl-purgestorage.sh hourly
26 */4 * * 0 /opt/edg/libexec/edg-wl-purgestorage.sh weekly
*/5 * * * * /opt/edg/libexec/edg-wl-check-daemons.sh
```

---

All those lines missing in the crontab of the machine under configuration should be added with the command

```
> crontab -e
```

via the crontab standard editor.



## 14. UPGRADE FROM THE PREVIOUS VERSION

This procedure is meant to help site administrators upgrade the node without starting an installation "from scratch", whenever possible.

The aim is to define those "delta" steps dealing both with installation and configuration phases. It is worthy of reminding that here "delta" refers to two contiguous software tags, the latter of which is the current one. Therefore, the procedure is not applicable to software versions more than two tags old.

**WARNING:** As a requirement for a successful upgrade, all the active servers which might be affected by the upgrade should be stopped.

The servers should be restarted once the installation and configuration described in the following sub paragraphs have been successfully done.

### 14.1. SOFTWARE INSTALLATION

The list "RB\_manual\_install\_rpm", which has been described in 2., contains the latest version of the RB-related rpms to be installed. If the `rpm -i` command were launched as described in that section, a large number of conflicts would be issued because most of the packages would be reported to be already installed, some of which with the same version number, some others with an older one.

The easiest way to handle this situation is to download those rpms which should update the ones already installed on the node as well as any new ones.

The list of these rpms is contained in the file

*RB\_upgrade\_rpm*

whereas the list with the complete command lines for the download is contained in the file

*RB\_upgrade\_wget*

**WARNING:** This script will create a directory tree where the rpms are downloaded and needs to be launched once only.

After downloading the rpms, the first thing to do is to update the rpms within the directory *RB\_UPGRADE*, by issuing the command

```
> rpm -U --oldpackage "*.rpm"
```

A further list of rpms is provided, namely

*RB\_upgrade\_forced\_rpm*

containing those new rpms whose dependencies are not dealt with, therefore requiring the installation to be "forced".

The same "wget" file

*RB\_upgrade\_wget*



takes also care to download the rpms of this final list in the directory

*RB\_UPGRADE\_FORCED*

The rpms listed in this directory should be installed with the command

```
> rpm -Uvh --force --nodeps "*.rpm"
```

Finally the list of rpms *RB\_remove\_rpm*

is provided which contains those packages which need to be removed; this is particularly likely to be necessary with CA-related rpms.

The rpm command to remove the listed rpms is

```
> rpm -e `cat RB_remove_rpm`
```

## 14.2. INSTALLING THE UP-TO-DATE CERTIFICATION AUTHORITY RPMS

As the list and structure of Certification Authorities (CA) accepted by the LCG project can change independently of the middleware releases, the rpm list related to the CAs certificates and URLs has been decoupled from the standard LCG release procedure. You should consult the page

<http://markusw.home.cern.ch/markusw/lcg2CAlist.html>

in order to ascertain what the version number of the latest set of CA rpms is. At time of writing it is 1.6, so the full set of rpms can be downloaded with the following command;

```
> wget -ll -nd -r http://grid-deployment.web.cern.ch/grid-deployment/download/RpmDir/security/index_r1.6.html
```

These rpms should then be installed in the usual way;

```
> rpm -Uvh *.rpm
```

Changes and updates to these settings will be announced on the LCG-Rollout mailing list.

## 14.3. UPGRADE CONFIGURATION

- Check section 12. for the RGMA client installation.
- Edit the file */opt/edg/var/etc/edg-fmon-agent.conf* and replace the line

```
CommandLine $(EDG_LOCATION)/libexec/edg-fmon-sensor-systemCheck
```

with the line



---

```
CommandLine $(EDG_LOCATION)/libexec/gridice-edg-fmon-sensor-systemCheck
```

Beware not to use spaces at the beginning of the line but to use three <TAB> characters.

Then re-start the GridICE agent

```
> service edg-fmon-agent restart
```



---

## 15. APPENDIX 1: STANDARD OUTPUT OF GLOBUS-INITIALIZATION.SH

---

```
creating globus-sh-tools-vars.sh
creating globus-script-initializer
creating Globus::Core::Paths
checking globus-hostname
/opt/globus/libexec/globus-libc-hostname: error while loading shared libraries:
libgcc_s.so.1: cannot open shared object file: No such file or directory
Done

Creating...
  /opt/globus/etc/grid-info.conf
/opt/globus/libexec/globus-libc-hostname: error while loading shared libraries:
libgcc_s.so.1: cannot open shared object file: No such file or directory
Done
/opt/globus/libexec/globus-libc-hostname: error while loading shared libraries:
libgcc_s.so.1: cannot open shared object file: No such file or directory

Creating...
  /opt/globus/sbin/SXXgris
  /opt/globus/libexec/grid-info-script-initializer
  /opt/globus/libexec/grid-info-mds-core
  /opt/globus/libexec/grid-info-common
  /opt/globus/libexec/grid-info-cpu*
  /opt/globus/libexec/grid-info-fs*
  /opt/globus/libexec/grid-info-mem*
  /opt/globus/libexec/grid-info-net*
  /opt/globus/libexec/grid-info-platform*
  /opt/globus/libexec/grid-info-os*
  /opt/globus/etc/grid-info-resource-ldif.conf
  /opt/globus/etc/grid-info-resource-register.conf
  /opt/globus/etc/grid-info-resource.schema
  /opt/globus/etc/grid.gridftpperf.schema
  /opt/globus/etc/gridftp-resource.conf
  /opt/globus/etc/gridftp-perf-info
  /opt/globus/etc/grid-info-slapd.conf
/opt/globus/libexec/globus-libc-hostname: error while loading shared libraries:
libgcc_s.so.1: cannot open shared object file: No such file or directory
  /opt/globus/etc/grid-info-site-giis.conf
  /opt/globus/etc/grid-info-site-policy.conf
  /opt/globus/etc/grid-info-server-env.conf
  /opt/globus/etc/grid-info-deployment-comments.conf

Done
Creating gatekeeper configuration file...
Done
Creating grid services directory...
Done
Creating state file directory.
Done.
Reading gatekeeper configuration file...
Warning: Host cert file: /etc/grid-security/hostcert.pem not found. Re-run
  setup-globus-gram-job-manager after installing host cert file.
Determining system information...
/opt/globus/libexec/globus-libc-hostname: error while loading shared libraries:
libgcc_s.so.1: cannot open shared object file: No such file or directory
Creating job manager configuration file...
Done
Setting up fork gram reporter in MDS
-----
Done

Setting up pbs gram reporter in MDS
-----
configure: error: Cannot locate qstat
loading cache /dev/null
checking for qstat... no
Error locating pbs commands, aborting!
Setting up condor gram reporter in MDS
-----
configure: error: Cannot locate condor_q
loading cache /dev/null
checking for condor_q... no
Error locating condor commands, aborting!
Setting up lsf gram reporter in MDS
-----
configure: error: Cannot locate lsload
loading cache /dev/null
checking for lsload... no
Error locating LSF commands, aborting!
configure: warning: Cannot locate mpirun
loading cache ./config.cache
checking for mpirun... no
updating cache ./config.cache
```



---

```
creating ./config.status
creating fork.pm
configure: warning: Cannot locate mpirun
configure: error: Cannot locate qdel
loading cache /dev/null
checking for mpirun... no
checking for qdel... no
Error locating PBS commands, aborting!
configure: error: Cannot locate condor_submit
loading cache /dev/null
checking for condor_submit... no
Error locating condor commands, aborting!
configure: warning: Cannot locate mpirun
configure: error: Cannot locate bsub
loading cache /dev/null
checking for mpirun... no
checking for bsub... no
Error locating LSF commands, aborting!
loading cache ./config.cache
creating ./config.status
creating grid-cert-request-config
creating grid-security-config
```

---



---

## 16. APPENDIX 2: NON GENERAL LCG USERS AND GROUPS IDS

–Groups:

```
edguser:x:995:  
sshd:x:74:  
edginfo:x:999:
```

Notice that reported above are the entries appearing in the file */etc/group*

–Users:

User *edguser* :

The user *edguser* belongs to the group *edguser* as well as *atlas*, *alice*, *cms*, *lhcb* and *dteam*

The user *edguser* has also a home directory in */home*.

Notice that many of the servers which run within the RB node are owned by the user *edguser* and so its presence is fundamental!!!

User *sshd*:

The user *sshd* belongs to the group *sshd*

The user *sshd* has NOT a home directory in */home*. Rather, its home directory is */var/empty/sshd* instead. Also notice that the default shell for this user should be */bin/false*, i.e. no login is allowed under the *sshd* user.

The user *sshd* is normally created by newer versions of *openssl* and so is not created in a standard red hat 7.3.

User *edginfo*:

The user *edginfo* belongs to the group *edginfo*

The user *edginfo* has NOT a home directory in */home*. Rather, its home directory is */opt/edg/var* instead.

Notice also that *edginfo* is not strictly required for the correct functioning of the node.



---

## 16.1. PRODUCTION EXAMPLE

Reported below are the standard steps required to create all the relevant non general groups and users.

### Groups creation

```
> groupadd -g 2688 dteam
> groupadd -g 1307 atlas
> groupadd -g 1470 lhcb
> groupadd -g 1399 cms
> groupadd -g 1395 alice

> groupadd -g 995 edguser
> groupadd -g 74 sshd
> groupadd -g 999 edginfo
```

### Users creation

```
> useradd -M -u 74 -g 74 -s /bin/false -d /var/empty/sshd sshd
> useradd -u 995 -g 995 -s /bin/bash edguser
> useradd -M -u 999 -g 999 -s /bin/bash -d /opt/edg/var edginfo
```

### Group members extension

```
> gpasswd -a edguser dteam
> gpasswd -a edguser atlas
> gpasswd -a edguser lhcb
> gpasswd -a edguser cms
> gpasswd -a edguser alice
```





## CHANGE HISTORY

Table 1: Change History

<i>version</i>	<i>date</i>	<i>description</i>
v1.0	29/Jan/04	First Release
v1.1	29/Jan/04	Minor Corrections in 7) ??
v1.2	30/Jan/04	Restructure of paragraph ?? and insertion in "gridmapdir" Dir of LCG users files creation!
v1.3	30/Jan/04	Minor Corrections.
v1.4	30/Jan/04	Reshaping of the document and Minor Corrections.
v1.5	30/Jan/04	Minor Corrections.
v1.6	30/Jan/04	Minor Corrections in Appendix ??.
v1.7	02/Feb/04	Ref. [1] specified. Minor corrections.
v1.8	02/Feb/04	Minor corrections.
v1.9	03/Feb/04	Appendix ??: edguser and edginfo creation corrected.
v2.0	04/Feb/04	Paragraph ??: Few corrections of the mkdir instructions.
v2.1	06/Feb/04	Minor corrections. Paragraph ??: Few mistakes corrected! Section ?? added.
v2.2	09/Feb/04	Minor corrections.
v2.3	15/Feb/2004	Appendix ?? inserted. Reference to appendix ?? inserted
v2.4	23/Feb/2004	Appendix ?? changed: rpm lists have been changed.
v2.5	12/Mar/2004	Appendix ?? changed
v2.5.2	15/Mar/2004	?? GLOBUS_LOCATION environment variable to be defined before launching the initialization script
v2.5.3	16/Mar/2004	?? Installation procedure updated
v2.5.4	18/Mar/2004	Chapter ?? and ?? changed
v2.6.0	01/Apr/2004	?: cvs references changed
v2.6.1	20/Apr/2004	?? and ?? paragraph names changed
v2.7.0	21/Apr/2004	Correction in ?? for the file <code>/opt/edg/etc/edg_wl.conf</code> : <code>ILPort = 2170</code> ;
v2.8.0	26/Apr/04	?: section inserted dealing with GridICE agent configuration. Upgrade section changed accordingly. Numbering changed consequently. - 9: section inserted dealing with Experiment Software Mangement tool (SGM) configuration. Upgrade section changed accordingly Numbering shifted up consequently.
v2.9.0	3/Aug/04	2.,14.: rpms dealing with CAs no more included in rpm lists.
v2.9.1	4/Aug/04	12.: rgma client installation included 11.1.: file <code>/opt/edg/var/etc/edg-fmon-agent.conf</code> changed (see 14.3. for details).
v2.9.2	10/Aug/04	12.: RGMA client configuration changed
v2.9.3	12/Aug/04	12.: configuration of file <code>/opt/edg/var/edg-rgma/rgma-defaults</code> changed