



LHC COMPUTING GRID

RGMA MON BOX NODE MANUAL INSTALLATION AND CONFIGURATION

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Abstract: *LCG RGMA Client Manual Installation Guide*



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ABSTRACT

Manual steps for the installation and configuration of a LCG RGMA 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/RGMA-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 RGMA software you need:

- a working Linux Redhat7.3 on the RGMA (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 RGMA machine
- references to software packages to be installed (see below)



2. RGMA SOFTWARE INSTALLATION

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

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

Two different methods are supported for RGMA software installation

- Centrally managed RGMA installation using the Debian *apt-get* tool
- Manual RGMA 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. RGMA INSTALLATION USING *apt-get*

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

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

2.2. RGMA 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/RGMA-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:

RGMA.pdf: this guide

RGMA_manual_install_rpm: plain full list of those rpms needed to install the RGMA software on top of a plain RH7.3 installation, whose dependencies are already dealt with.



RGMA_manual_install_forced_rpm: plain full list of those rpms needed to install the RGMA 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

RGMA_manual_install_wget: a shell script which downloads, from the LCG mirror site at CERN, the rpms included into the list *RGMA_manual_install_rpm*

RGMA_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 *RGMA_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 **RGMA_tools.tar.gz**. So they can be easily downloaded and used on target machines.

The provided *RGMA_manual_install_rpm* includes:

- all the packages which are needed in order to have a production RGMA.
- all the general purpose objects (i.e. shared libraries or common applications) which the RGMA 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 **RGMA_tools.tar.gz**.
- extract the archived files.

```
> gunzip RGMA_tools.tar.gz  
> tar xvf RGMA_tools.tar
```

- give execution permissions and run the script *RGMA_manual_install_wget*, which will then fetch all the rpms required into the subdirectories *RGMA_INSTALL* and *RGMA_INSTALL_FORCED*

```
> cd RGMA_tools  
> chmod u+x RGMA_manual_install_wget  
> ./RGMA_manual_install_wget
```



Install the downloaded rpms

- In the directory **RGMA_INSTALL**, where the rpms listed in *RGMA_manual_install_rpm* have been downloaded, run the command

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

- In the directory **RGMA_INSTALL_FORCED** where the rpms listed in *RGMA_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 *RGMA_manual_install_rpm* list.

Should you prefer to do an upgrade of the RGMA 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 RGMA 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
```



4. RGMA MON-BOX DESCRIPTION

In what follows the installation and configuration of a standard RGMA MOM BOX is described. The MOM BOX receives the information so produced and forwards it to a central registry (currently located at RAL). As such only one such machine per site is required. Notice also that the MON BOX stores the site information in its own database.



5. RGMA MON-BOX CONFIGURATION

5.1. RGMA USER CREATION

The user and group edginfo must be present, so create them if not already there, e.g.

```
groupadd -g 999 edginfo
useradd -M -u 999 -g 999 -s /bin/bash -d /opt/edg/var edginfo
```

5.2. 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 5.3.)

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.

5.3. RGMA CONFIGURATION CREATION

Launch the following script to configure rgma

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



6. RGMA MYSQL

Issue the following command to set up the mysql database

```
> mysql -u root -p < /opt/edg/var/edg-rgma/rgma-db-setup.sql
```

This command will require the password to be entered. Make sure you first define a password as such, as suggested during the installation of the relevant rpms:

```
> /usr/bin/mysqladmin -u root password 'new-password'
```

OR

```
> /usr/bin/mysqladmin -u root -h <NODE_NAME>.cern.ch password 'new-password'
```

where <NODE_NAME> is the name of the machine you are installing the MON BOX in.



7. SERVERS START UP

Launch tomcat

```
/etc/init.d/edg-tomcat4 start
```

7.1. CRON TABLE CONFIGURATION

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

```
PATH=/sbin:/bin:/usr/sbin:/usr/bin
*/2 * * * * /opt/edg/etc/cron/edg-rgma-service-status-monitor >> /opt/edg/var/log/edg-rgma-tools.log 2>&1
*/2 * * * * /opt/edg/etc/cron/edg-rgma-servlet-monitor >> /opt/edg/var/log/edg-rgma-tools.log 2>&1
5 8 * * * /usr/sbin/tmpwatch -f 96 /var/log/tomcat4
```

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.

CHANGE HISTORY

Table 1: Change History

<i>version</i>	<i>date</i>	<i>description</i>
v1.0	30/Jul/04	5.2.: RGMA server configuration
v1.1	10/Aug/04	5.2.: RGMA server configuration changed