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Notes about Installation and Configuration of EMI-3 (SL6) LFC server

- These notes are provided by site admins on a best effort base as a contribution to the IGI communities and **MUST not be considered as a substitute of the Official IGI documentation** .
- This document is addressed to site administrators responsible for middleware installation and configuration.
- The goal of this page is to provide some hints and examples on how to install and configure an IGI LFC server based on EMI/UMD middleware.

NB: LFC service is a **CORE** service, it should not be installed at Resource Center level. If you want to provide an official instances which will be added to the IGI endpoint, please contact igi-noc@lists.italiangrid.it

References

1. EMI 3 Monte Bianco Products - LFC v. 1.8.6
2. YAIM configuration variables
3. About IGI - Italian Grid infrastructure
4. About IGI Release
5. IGI Official Installation and Configuration guide
6. Troubleshooting Guide for Operational Errors on EGI Sites
7. Grid Administration FAQs page

Recommendations and Scenarios

- A full virtualized machine based on KVM has been used in the following notes. There are four installation scenarios that can be follow.

Scenario 1 (all in one)

LFC frontend and backend are installed on the same server. The service needs at least two cores, 4 GB RAM, 10 GB disk space (disk space highly depends on the number of VOs that will be use the instance).

Scenario 2 (n frontends and one backend)

In this scenario the frontend and the backend are installed on separate servers. The number of frontends could be higher than one for load balancing and high availability purpose.

Scenario 3 (n frontends and high availability backend)

In this scenario the frontends and backends are installed on separate server and the backend, based on mysql, is configured in high availability mode (master-master replica).

Scenario 4 (n frontends and high availability mysql using pacemaker and corosync)

In this scenario the frontends and backends are installed on separate server and the backend, based on mysql, is configured in high availability mode (master-slave) through pacemaker and corosync.

Service Installation

In this note, **scenario 4** has been followed.

HOSTNAME
lfcserver01
lfcserver02

O.S. and Repos

- Starts from a fresh installation of Scientific Linux 5.x (x86_64).

```
# cat /etc/redhat-release
Scientific Linux release 6.4 (Carbon)
```

- Install the additional repositories: EPEL, Certification Authority, EMI-3

```
# cd /etc/yum.repos.d/
# rpm -ivh http://mirror.switch.ch/ftp/mirror/epel/6/x86_64/epel-release-6-8.noarch.rpm
# wget http://repo-pd.italiangrid.it/mrepo/repos/egi-trustanchors.repo
# rpm -ivh http://emisoft.web.cern.ch/emisoft/dist/EMI/3/sl6/x86_64/base/emi-release-3.0.0-2.el6
# yum install yum-priorities yum-protectbase
```

- Be sure that SELINUX is disabled (or permissive). Details on how to disable SELINUX are here :

```
# getenforce
Disabled
```

GlusterFS, pacemaker and corosync

The idea is:

- to use glusterfs to setup a volume to be mounted under `/var/lib/mysql`;
- to use pacemaker and corosync to managed primary/slave configuration for mysql.

GlusterFS volume setup

GlusterFS configuration is not covered here.

```
gluster volume info

Volume Name: volume-mysql
Type: Replicate
Volume ID: 5e8e3ed1-ab16-45cd-ac07-7fa61b7056f2
Status: Started
Number of Bricks: 1 x 2 = 2
Transport-type: tcp
Bricks:
Brick1: lfcserver01.cnaf.infn.it:/glusterfs/br-mysql
Brick2: lfcserver02.cnaf.infn.it:/glusterfs/br-mysql
Options Reconfigured:
auth.allow: 131.154.101.61,131.154.101.156
```

The volume is mounted under `/var/lib/mysql` on both lfc nodes.

Update host and perform the installation of middleware package(s)

```
# yum clean all
Loaded plugins: downloadonly, kernel-module, priorities, protect-packages, protectbase, security,
Cleaning up Everything
```

```
# yum install -y ca-policy-egi-core emi-lfc_mysql lfc-dli
[...]
```

lfc-dll rpm must be installed due to a bug (GGUS 95081)

MySQL server installation and configuration

NB: If you want to install/run a MySQL server in the same host as the LFC, add `mysql-server` to the yum install command above.

```
# yum install -y mysql-server
Loaded plugins: downloadonly, kernel-module, priorities, protect-packages, protectbase, security,
[...]
```

Complete!

- Configure MySQL to start at boot time

```
# chkconfig mysqld on
```

- Start MySQL server

```
# /etc/init.d/mysqld start
Initializing MySQL database: Installing MySQL system tables...
OK
Filling help tables...
OK
```

To start mysqld at boot time you have to copy
support-files/mysql.server to the right place for your system

PLEASE REMEMBER TO SET A PASSWORD FOR THE MySQL root USER !
To do so, start the server, then issue the following commands:
/usr/bin/mysqladmin -u root password 'new-password'
/usr/bin/mysqladmin -u root -h lfcserver04.cnafl.infn.it password 'new-password'

Alternatively you can run:
/usr/bin/mysql_secure_installation

which will also give you the option of removing the test
databases and anonymous user created by default. This is
strongly recommended for production servers.

See the manual for more instructions.

You can start the MySQL daemon with:
cd /usr ; /usr/bin/mysqld_safe &

You can test the MySQL daemon with mysql-test-run.pl
cd mysql-test ; perl mysql-test-run.pl

Please report any problems with the /usr/bin/mysqlbug script!

The latest information about MySQL is available on the web at
<http://www.mysql.com>
Support MySQL by buying support/licenses at <http://shop.mysql.com>

```
Starting MySQL: [ OK ]
```

- Configure MySQL service using /usr/bin/mysql_secure_installation

```
# /usr/bin/mysql_secure_installation
```

```
NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MySQL  
SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!
```

```
In order to log into MySQL to secure it, we'll need the current  
password for the root user. If you've just installed MySQL, and  
you haven't set the root password yet, the password will be blank,  
so you should just press enter here.
```

```
Enter current password for root (enter for none):  
OK, successfully used password, moving on...
```

```
Setting the root password ensures that nobody can log into the MySQL  
root user without the proper authorisation.
```

```
Set root password? [Y/n] Y  
New password:  
Re-enter new password:  
Password updated successfully!  
Reloading privilege tables..  
... Success!
```

```
By default, a MySQL installation has an anonymous user, allowing anyone  
to log into MySQL without having to have a user account created for  
them. This is intended only for testing, and to make the installation  
go a bit smoother. You should remove them before moving into a  
production environment.
```

```
Remove anonymous users? [Y/n] Y  
... Success!
```

```
Normally, root should only be allowed to connect from 'localhost'. This  
ensures that someone cannot guess at the root password from the network.
```

```
Disallow root login remotely? [Y/n] Y  
... Success!
```

```
By default, MySQL comes with a database named 'test' that anyone can  
access. This is also intended only for testing, and should be removed  
before moving into a production environment.
```

```
Remove test database and access to it? [Y/n] Y  
- Dropping test database...  
... Success!  
- Removing privileges on test database...  
... Success!
```

```
Reloading the privilege tables will ensure that all changes made so far  
will take effect immediately.
```

```
Reload privilege tables now? [Y/n] Y  
... Success!
```

```
Cleaning up...
```

```
All done! If you've completed all of the above steps, your MySQL  
installation should now be secure.
```

```
Thanks for using MySQL!
```

LFC Service configuration

LFC YAIM variables are reported [here](#)

- Start from example:

```
# cp -vr /opt/glite/yaim/examples/siteinfo .
`/opt/glite/yaim/examples/siteinfo' -> `./siteinfo'
`/opt/glite/yaim/examples/siteinfo/services' -> `./siteinfo/services'
`/opt/glite/yaim/examples/siteinfo/services/lfc_oracle' -> `./siteinfo/services/lfc_oracle'
`/opt/glite/yaim/examples/siteinfo/services/glite-bdii_site' -> `./siteinfo/services/glite-bdii_site'
`/opt/glite/yaim/examples/siteinfo/services/lfc_mysql' -> `./siteinfo/services/lfc_mysql'
`/opt/glite/yaim/examples/siteinfo/site-info.def' -> `./siteinfo/site-info.def'

# rm /root/siteinfo/services/lfc_oracle /root/siteinfo/services/glite-bdii_site
```

site-info.def

The configuration file for this service is really basic:

```
# cat /root/siteinfo/site-info.def
#####
# Site configuration variables #
#####
SITE_NAME=IGI-BOLOGNA
SITE_EMAIL="grid-operations@lists.cnaf.infn.it"
SITE_LAT=44.4948
SITE_LONG=11.3417
# Download the last files (groups.conf and users.conf) at https://wiki.italiangrid.it/twiki/bin/view/IGI/Groups
GROUPS_CONF=/root/igi-siteinfo/groups.conf
USERS_CONF=/root/igi-siteinfo/users.conf

MYSQL_PASSWORD=XXXXXXXXXX
VOS="argo ams02.cern.ch babar bio cdf compchem comput-er.it superbvo.org enea glast.org gridit infn.it
fn.it virgo euchina enmr.eu euindia cyclops compassit ops dteam infngrid"
```

emi_lfc_mysql

The configuration file for this service is really basic:

```
# cat /root/siteinfo/services/emi_lfc_mysql
# LFC hostname
LFC_HOST=lfcserver01.cnaf.infn.it

LFC_HOST_ALIAS="lfcserver.cnaf.infn.it"

LFC_DB_HOST=gridstore1.cnaf.infn.it
LFC_DB=cns_db
LFC_DB_PASSWORD="XXXXXXXXXX"

LFC_LOCAL="ops infngrid dteam"
LFC_CENTRAL="argo ams02.cern.ch babar bio cdf compchem comput-er.it superbvo.org enea glast.org gridit
fn.it virgo euchina enmr.eu euindia cyclops compassit"
```

vo.d directory

Create the directory `siteinfo/vo.d` and fill it with a file for each supported VO. You can download them from [HERE](#) and here an example for some VOs. Information about the several VOs are available at the [CENTRAL OPERATIONS PORTAL](#).

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```
# ls vo.d/
ams02.cern.ch  bio                compassit         cyclops           ene
argo          cdf                compchem          d4science.research-infrastructures.eu  enm
babar         climate-g.vo.eu-egee.org  comput-er.it     dteam            eti
```

yaim check

```
# chmod -R 600 /root/siteinfo

# # /opt/glite/yaim/bin/yaim -v -s /root/igi-siteinfo/site-info.def -n emi_lfc_mysql
INFO: Configuring HOST: lfcserver01.cnaf.infn.it
INFO: Using site configuration file: /root/igi-siteinfo/site-info.def
INFO: Sourcing service specific configuration file: /root/igi-siteinfo/services/emi_lfc_mysql
INFO:
#####

.          /'-. ' )
.   yA,-"-,( ,m,:/ ) .oo.   oo   o   ooo o.   .oo
.   /          .-Y a   a Y-.   8. .8'   8'8.   8   8b   d'8
.   /          ~ ~ /          8'   .8oo88.   8   8   8'   8
.   (_/          '===='       8   .8'   8.   8   8   Y   8
.   Y,-''-,Yy,-.,/          o8o  o8o   o88o  o8o  o8o   o8o
.   I_))_) I_))_)

current working directory: /root/igi-siteinfo
site-info.def date: Aug 9 11:08 /root/igi-siteinfo/site-info.def
yaim command: -v -s /root/igi-siteinfo/site-info.def -n emi_lfc_mysql
log file: /opt/glite/yaim/bin/./log/yaimlog
Thu Aug 9 11:09:05 CEST 2012 : /opt/glite/yaim/bin/yaim

Installed YAIM versions:
glite-yaim-bdii 4.3.9-1
glite-yaim-core 5.1.0-1
glite-yaim-lfc 4.2.4-1

[...]
INFO: YAIM terminated succesfully.
```

yaim config

Please use the debug flag ("-d 6") to configure the services in order to have detailed information. For your convenience yo can save all the configuration information in a log file you can look at any time, separated from the yaimlog defulat one.

```
# /opt/glite/yaim/bin/yaim -d 6 -c -s /root/igi-siteinfo/site-info.def -n emi_lfc_mysql
DEBUG: Checking siteinfo dir is not world readable
DEBUG: Checking site-info.def is syntactically correct
INFO: Configuring HOST: lfcserver01.cnaf.infn.it
DEBUG: Sourcing /opt/glite/yaim/bin/./defaults/site-info.pre
DEBUG: Sourcing /opt/glite/yaim/bin/./defaults/emi_lfc_mysql.pre
INFO: Using site configuration file: /root/igi-siteinfo/site-info.def
DEBUG: Sourcing site-info.def file: /root/igi-siteinfo/site-info.def
INFO: Sourcing service specific configuration file: /root/igi-siteinfo/services/emi_lfc_mysql
DEBUG: Sourcing /opt/glite/yaim/bin/./defaults/site-info.post
DEBUG: Sourcing /opt/glite/yaim/bin/./defaults/mapping
INFO:
#####

.          /'-. ' )
.   yA,-"-,( ,m,:/ ) .oo.   oo   o   ooo o.   .oo
.   /          .-Y a   a Y-.   8. .8'   8'8.   8   8b   d'8
.   /          ~ ~ /          8'   .8oo88.   8   8   8'   8
.   (_/          '===='       8   .8'   8.   8   8   Y   8
.   Y,-''-,Yy,-.,/          o8o  o8o   o88o  o8o  o8o   o8o
```

```
.      I_))_ I_))_

      current working directory: /root/igi-siteinfo
[...]  
INFO: Configuration Complete. [ OK ]  
INFO: YAIM terminated succesfully.
```

Service checks

From a User Interfaces, try the following commands (replace `lfcserver01.cnaf.infn.it` with your LFC frontend hostname):

- Create a valid proxy for a VO supported by the LFC server, e.g. `voms-proxy-init --voms dteam`
- Export the following variables:

```
export LCG_CATALOG_TYPE=lfc  
export LFC_HOST=lfcserver01.cnaf.infn.it  
export LFC_HOME=/grid/dteam
```

- Ping the service (take a look at `/var/log/lfc/log` on the LFC server)

```
$ lfc-ping -h lfcserver01.cnaf.infn.it  
1.8.3.1-0
```

- Use `lcg-cr` command to copy & register (and the delete) a file on LFC, take a look at `/var/log/lfc/log` on the frontend

```
# lcg-cr -v --vo dteam -d se-srm-00.to.infn.it -P host-wms-list-no-checksum.txt -l lfn:host-wms-1  
# lcg-del -a --vo dteam lfn:/grid/dteam/host-wms-list-no-checksum.txt
```

Revisions

Date	Comment
2013-06-24	installation notes completed - EMI 3 Monte Bianco Products - LFC v. 1.8.6

-- PaoloVeronesi - 2013-06-24

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