



EUROPEAN MIDDLEWARE INITIATIVE

GENERIC INSTALLATION & CONFIGURATION FOR EMI 1

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Generic Installation & Configuration for EMI 1

This document is addressed to Site Administrators responsible for middleware installation and configuration. It is a generic guide to manual installation and configuration for any supported node types.

The list of supported node types can be found in the EMI 1 web pages.

When installing a particular node type please also have a look at the specific release page of that node type to get specific installation information.

Installing the Operating System

All EMI 1 components are fully supported on the SL5/64 platform with EPEL as repository for external components.

Full platform support means the component is distributed from the EMI repository using certified source and binary packages according to the format specification of the platform.

Scientific Linux 5

The OS version of EMI 1 is Scientific Linux 5 (SL). For more information please check:
<http://www.scientificlinux.org>

All the information to install the operating system can be found: <https://www.scientificlinux.org/download>
Example of **sl.repo** file

```
[core]
name=name=SL 5 base
baseurl=http://linuxsoft.cern.ch/scientific/5x/$basearch/SL
    http://ftp.scientificlinux.org/linux/scientific/5x/$basearch/SL
    http://ftp1.scientificlinux.org/linux/scientific/5x/$basearch/SL
    http://ftp2.scientificlinux.org/linux/scientific/5x/$basearch/SL
protect=0
```

Node synchronization, NTP installation and configuration

A general requirement is that the nodes are synchronized. This requirement may be fulfilled in several ways. If your nodes run under AFS they are most likely 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 this section.

Use the latest ntp version available for your system. If you are using APT, an apt-get install ntp will do the work.

- 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 iptables, you can add the following to /etc/sysconfig/iptables

```
-A INPUT -s NTP-serverIP-1 -p udp --dport 123 -j ACCEPT
-A INPUT -s NTP-serverIP-2 -p udp --dport 123 -j ACCEPT
```

Remember that, in the provided examples, 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/iptables restart
```

- Activate the ntpd service with the following commands:

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

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

```
# ntpq -p
```

Cron and logrotate

Many middleware components rely on the presence of cron (including support for /etc/cron.* directories) and logrotate. You should make sure these utils are available on your system.

Host Certificates

All nodes except UI, WN and BDII require the host certificate/key files to be installed. Contact your Certification Authority (CA) to understand how to obtain a host certificate if you do not have one already.

Once you have obtained a valid certificate:

- *hostcert.pem* - containing the machine public key
- *hostkey.pem* - containing the machine private key

make sure to place the two files in the target node into the */etc/grid-security* directory and check the access right for *hostkey.pem* is only readable by root and that the public key, *hostcert.pem*, is readable by everybody.

Installing the Middleware

For SL5 the yum package manager is considered to be the default installation tool.

Repositories

For a successful installation, you will need to configure your package manager to reference a number of repositories (in addition to your OS);

The middleware (EMI) repository

All EMI components are distributed from a single repository having the following structure:

- EMI-production (stable), **EMI/{1,2,3}**:
 - ◆ stable and signed, well tested software components, recommended to be installed on production-sites;
- EMI-testing, **testing/{1,2,3}**:
 - ◆ packages that will become part of the next stable distribution; passed the certification and validation phase and are available for technical-previews
- platform/{arch-s,tgz,SRPMS}/{base/updates/third-party}

The packages are signed with the EMI gpg key, that can be downloaded from here The fingerprint of the key is:

```
pub 1024D/DF9E12EF 2011-05-04
    Key fingerprint = AC82 01B1 DD50 6F4D 649E DFFC 27B3 331E DF9E 12EF
uid                               Doina Cristina Aiftimiei (EMI Release Manager) <aiftim@pd.infn.it>
sub 2048g/C1E57858 2011-05-04
```

To use yum:

- install the emi-release package. It will install also the EMI public key - or -
- wget the yum repository files from the following web address and copy it in /etc/yum.repos.d:
 - ◆ emi1-base.repo

```
[EMI-1-base]
name=EMI 1 base Repository
baseurl=http://emisoft.web.cern.ch/emisoft/dist/EMI/1/sl5/$basearch/base
priority=45
protect=1
enabled=1
```

- ◆ emi1-updates.repo

```
[EMI-1-updates]
name=EMI 1 updates
baseurl=http://emisoft.web.cern.ch/emisoft/dist/EMI/1/sl5/$basearch/updates
protect=1
enabled=1
# To use priorities you must have yum-priorities installed
priority=45
gpgcheck=1
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-emi
```

- ◆ emi1-third-party.repo

```
[EMI-1-third-party]
```

```

name=EMI 1 third-party
baseurl=http://emisoft.web.cern.ch/emisoft/dist/EMI/1/sl5/$basearch/third-party
protect=1
enabled=1
# To use priorities you must have yum-priorities installed
priority=45
gpgcheck=0

```

The Certification Authority repository

All the details on how to install the CAs can be found in EGI IGTF release pages. Example of **ca.repo** file:

```

[EGI-trustanchors]
name=EGI-trustanchors
baseurl=http://repository.egi.eu/sw/production/cas/1/current/
gpgkey=http://repository.egi.eu/sw/production/cas/1/GPG-KEY-EUGridPMA-RPM-3
gpgcheck=1
enabled=1

```

For installation please follow the instructions provided here, as it is the place where EGI keeps the updated version of this documentation.

The EPEL repository

If not present by default on your SL5/x86_64 nodes, you should enable the EPEL repository

EPEL has an 'epel-release' package that includes gpg keys for package signing and repository information. Installing this package, epel-release-5-4.noarch.rpm, should allow you to use normal tools such as yum to install packages and their dependencies. By default the stable EPEL repo is enabled. Example of **epel.repo** file:

```

[extras]
name=epel
mirrorlist=http://mirrors.fedoraproject.org/mirrorlist?repo=epel-5&arch=$basearch
protect=0

```

Installations

You need to have enabled only the above repositories (Operating System, EPEL, Certification Authority, EMI).

Example of a general installation of a node:

```

# yum update
# yum install ca-policy-egi-core
# yum install <meta-package name>

```

NOTE: it happened that on other operating systems than SL5/x86_64, as for example CentOS, for certain node-types you have to install first the jdk (SunJdk) package. Please refer to your Operating System documentation to learn how to do this.

The table below lists the available EMI meta-packages:

| Node Type | meta-package name | Comments |
|-----------------|-------------------------------|--|
| AMGA_postgresql | emi-amga-postgresql | Details - Section 2 "Installation" |
| APEL | emi-apel | Details - Section3 - "Installation Instructions" |
| ARC-CE | nordugrid-arc-compute-element | |

| | | |
|----------------------|---------------------------------|---|
| ARC Clients | nordugrid-arc-client-tools | arc* tools ng* tools |
| ARC InfoSys | nordugrid-arc-information-index | |
| ARGUS | emi-argus | |
| BDII_site | emi-bdii-site | |
| BDII_top | emi-bdii-totp | |
| CLUSTER | emi-cluster | |
| CREAM | emi-cream-ce | Installation of CREAM |
| CREAM LSF module | emi-lsf-utils | |
| CREAM TORQUE module | emi-torque-utils | |
| DPM mysql | emi-se-dpm-mysql | specific installation |
| DPM disk | emi-se-dpm-disk | specific installation |
| GLEEXEC_wn | emi-glexec-wn | The GLEEXEC_wn should always be installed together with a WN. more details in the Section "Installation" |
| LB | emi-lb | more info |
| LFC mysql | emi-lfc-mysql | specific installation |
| LFC oracle | emi-lfc-oracle | specific installation |
| MPI_utils | glite-mpi | MPI implementation instalaltion specific MPI-start instalaltion |
| STORM_backend | emi-storm-backend-mp | |
| STORM_frontend | emi-storm-frontend-mp | |
| STORM_checksum | emi-storm-checksum-mp | |
| STORM_gridhttps | emi-storm-gridhttps-mp | |
| STORM_globus_gridftp | emi-storm-globus-gridftp-mp | |
| STORM_srm_client | emi-storm-srm-client-mp | |
| TORQUE WN config | emi-torque-client | |
| TORQUE server config | emi-torque-server | |
| UNICORE/X | | |
| UNICORE-UCC | | |
| UNICORE Gateway | | |
| UNICORE-HILA | | |
| UNICORE Registry | | |
| UNICORE TSI | | |
| UNICORE XUADB | | |
| UNICORE UVOS | | |
| VOMS_mysql | emi-voms-mysql | |
| VOMS_oracle | emi-voms-oracle | |
| WMS | emi-wms | |

Configuring the Middleware

Using the YAIM configuration tool

Some of EMI services can be configured using the YAIM tool. For a detailed description on how to configure the middleware with YAIM, please check the YAIM guide.

The necessary YAIM modules needed to configure a certain node type are automatically installed with the middleware. However, if you want to install YAIM rpms separately, you can install them by running `yum install glide-yaim-<node-type>`. This will automatically install the YAIM module you are interested in together with `yaim core`, which contains the core functions and utilities used by all the YAIM modules.

Configuration information

The table below lists the configuration instructions for some of EMI services:

| Node Type/Service | Comments |
|-------------------|--|
| AMGA_postgresql | yaim configuration target "AMGA_postgresql" use yaim |
| APEL | yaim configuration target "APEL" use yaim |
| ARC-CE | Sections 9-11 |
| ARC Clients | arc* tools ARC Client Configuration Section "Configuration" |
| ARC InfoSys | Details |
| ARGUS | yaim config target "ARGUS_server" use yaim ARGUS Deployment |
| BDII_site | yaim config target "BDII_site" use yaim |
| BDII_top | yaim config target "BDII_top" use yaim |
| CLUSTER | CLUSTER config |
| CREAM | yaim config target "creamCE" CREAM Configuration |
| CREAM LSF module | yaim config target "LSF_utils" use yaim |
| DPM mysql | yaim config target "SE_dpm_mysql" use yaim specific HEAD_node configuration |
| DPM disk | yaim config target "SE_dpm_disk" use yaim specific DISK_node configuration |
| GLEEXEC_wn | yaim config target "GLEEXEC_wn" use yaim The GLEEXEC_wn should always be installed together with a WN. |
| LB | yaim config target "LB" use yaim more info |

| | |
|----------------------|---|
| LFC mysql | yaim config target "LFC_mysql" use yaim specific configuration |
| LFC oracle | yaim config target "LFC_oracle" use yaim specific configuration |
| MPI_utils | yaim config target "MPI_utils" use yaim Config batch system details on MPI-start configuration |
| STORM_backend | yaim config target "SE_storm_backend" use yaim |
| STORM_frontend | yaim config target "SE_storm_frontend" use yaim |
| STORM_checksum | yaim config target "SE_storm_checksum" use yaim |
| STORM_gridhttps | yaim config target "SE_storm_gridhttps" use yaim |
| STORM_globus_gridftp | yaim config target "SE_storm_globus_gridftp" use yaim |
| STORM_srm_client | |
| TORQUE WN config | yaim config target "TORQUE_client" use yaim |
| TORQUE server config | yaim config target "TORQUE_server" use yaim |
| CREAM TORQUE module | yaim config target "TORQUE_utils" use yaim |
| UNICORE/X | |
| UNICORE-UCC | |
| UNICORE Gateway | |
| UNICORE-HILA | |
| UNICORE Registry | |
| UNICORE TSI | |
| UNICORE XUADB | |
| UNICORE UVOS | |
| VOMS_mysql | yaim config target "VOMS_mysql" use yaim more information |
| VOMS_oracle | yaim config target "VOMS_oracle" use yaim more information |
| WMS | yaim config target "WMS" use yaim more details on WMS config file |

The LSF batch system

You have to make sure that the necessary packages for submitting jobs to your LSF batch system are installed on your CE. By default, the packages come as tar balls. At CERN they are converted into rpms so that they can be automatically rolled out and installed in a clean way (in this case using Quattor).

Since LSF is a commercial software it is not distributed together with the gLite middleware. Visit the Platform's LSF home page for further information. You'll also need to buy an appropriate number of license keys before you can use the product.

The documentation for LSF is available on Platform Manuals web page. You have to register in order to be able to access it.

The CREAM for LSF

- follow the CREAM Configuration Guide

The WN for LSF

Apart from the LSF specific configurations settings there is nothing special to do on the worker nodes. \After installing:

```
# yum install emi-wn
# /opt/glite/yaim/bin/yaim -c -s site-info.def -n WN
```

just use the plain WN configuration target.

```
/opt/glite/yaim/bin/yaim -c -s site-info.def -n WN
```

Note on site-BDII for LSF

When you configure your site-BDII you have to populate the [vomap] section of the `/etc/lcg-info-dynamic-scheduler.conf` file yourself. This is because LSF's internal group mapping is hard to figure out from yaim, and to be on the safe side the site admin has to crosscheck. Yaim configures the `lcg-info-dynamic-scheduler` in order to use the LSF info provider plugin which comes with meaningful default values. If you would like to change it edit the `/etc/glite-info-dynamic-lsf.conf` file. After YAIM configuration you have to list the LSF group - VOMS FQAN - mappings in the [vomap] section of the `/etc/lcg-info-dynamic-scheduler.conf` file.

As an example you see here an extract from CERN's config file:

```
vomap :
  grid_ATLAS:atlas
  grid_ATLASSGM:/atlas/Role=lcgadmin
  grid_ATLASPRD:/atlas/Role=production
  grid_ALICE:alice
  grid_ALICESGM:/alice/Role=lcgadmin
  grid_ALICEPRD:/alice/Role=production
  grid_CMS:cms
  grid_CMSSGM:/cms/Role=lcgadmin
  grid_CMSPRD:/cms/Role=production
  grid_LHCB:lhcb
  grid_LHCBSGM:/lhcb/Role=lcgadmin
  grid_LHCBPRD:/lhcb/Role=production
  grid_GEAR:gear
  grid_GEARSGM:/gear/Role=lcgadmin
  grid_GEANT4:geant4
  grid_GEANT4SGM:/geant4/Role=lcgadmin
  grid_UNOSAT:unosat
  grid_UNOSAT:/unosat/Role=lcgadmin
  grid_SIXT:sixt
  grid_SIXTSGM:/sixt/Role=lcgadmin
  grid_EELA:eela
  grid_EELASGM:/eela/Role=lcgadmin
  grid_DTEAM:dteam
```

```
grid_DTEAMSGM:/dteam/Role=lcgadmin
grid_DTEAMPRD:/dteam/Role=production
grid_OPS:ops
grid_OPSSGM:/ops/Role=lcgadmin
module_search_path : ../lrms:../ett
```

The Torque/PBS batch system

TORQUE Server

- if you want to have a dedicated node for the TORQUE server:

```
# yum install emi-torque-server emi-torque-utils
# /opt/glite/yaim/bin/yaim -c -s site-info.def -n TORQUE_server -n TORQUE_utils
```

- if you want to install configure the TORQUE server on the same node as the CREAM Computing Element:

```
# yum install emi-cream-ce emi-torque-server emi-torque-utils
# /opt/glite/yaim/bin/yaim -c -s site-info.def -n creamCE -n TORQUE_server -n TORQUE_utils
```

For more details see the CREAM System Administrator Guide

The WN for Torque/PBS

```
# yum install emi-wn emi-torque-client
# /opt/glite/yaim/bin/yaim -c -s site-info.def -n WN -n TORQUE_client
```

The UI

```
# yum install emi-ui
# /opt/glite/yaim/bin/yaim -c -s site-info.def -n UI
```

-- DoinaCristinaAiftimiei - 17-Apr-2011

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