EGI Hands-On Training for AEGIS Site Administrators
School of Electrical Engineering of the University of Belgrade

CREAM CE and site BDII Installation

Vladimir Slavnic
SCL, Institute of Physics Belgrade
Serbia
slavnic@ipb.ac.rs

23/11/2012

e-infrastructure

CREAM CE

- The **CREAM CE** (Computing Resource Execution And Management) Service is a simple, lightweight service that implements all the operations at the Computing Element (CE) level
- It has Web Service-based interface
- Implemented as an extension of the Java-Axis servlet (running inside the Apache Tomcat container)

OS installation

- Supported versions:
  - SL5 64 bit
  - SL6 64 bit
- Installation and configuration of the NTP service
- SELINUX configuration (disable)
- YUM auto update should be disabled
- Mount all shared file systems (edit /etc/fstab)

  - /home - /opt/exp_soft

  - /etc/fstab example entry:

  se1.ipb.ac.rs:/storage6/exp_soft-ce64 /opt/exp_soft nfs \
  hard,intr,nodev,nosuid,tcp,timeo=15 0 0

Repositories configuration [1]

- UMD-2 based installation
- Disable DAG repository if available on the system
- Remove all UMD and EPEL related configuration files that may exist from */etc/yum.repos.d/*
- Install the appropriate EPEL repository:
  # wget http://download.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-7.noarch.rpm
  #yum install epel-release-6-7.noarch.rpm

Repositories configuration [2]

- Install yum-priorities and protect-base
  # yum install yum-priorities yum-protectbase
- Install SL5 umd-release RPM or SL6 umd-release RPM
  - This adds all missing repositories that are needed for the installation of UMD products and configures yum priorities
    # wget http://repository.egi.eu/sw/production/umd/2/sl6/x86_64/base/umd-release-2.0.0-1.el6.noarch.rpm
    # yum install umd-release-2.0.0-1.el6.noarch.rpm

Certification Authorities

- Installation of the CA certificates

```
# yum install ca-policy-egi-core
```

Installation of the CREAM CE software (no cluster mode)

- Install the CREAM-CE metapackage:

  # yum install emi-cream-ce

- Install Torque metapackages
  - In the case of Torque, and if CREAM CE node is the torque master:

  # yum install emi-torque-server emi-torque-utils

  - If the case of Torque, and if CREAM CE node is NOT the torque master:

  # yum install emi-torque-utils

Installation of the site BDII software

- In the case of the site BDII on the same machine:

  # yum install emi-bdii-site

Installation of the host certificate

- Install host certificate in */etc/grid-security* directory
  - hostcert.pem - containing the machine public key
  - hostkey.pem - containing the machine private key

 # chown root.root /etc/grid-security/hostcert.pem

 # chown root.root /etc/grid-security/hostkey.pem

 # chmod 600 /etc/grid-security/hostcert.pem

 # chmod 400 /etc/grid-security/hostkey.pem

Configuration via YAIM [1]

- YAIM configuration files:
  - site-info.def
  - groups.conf
  - users.conf
  - wn-list.conf
  - vo.d/*
  - services/*

Configuration via YAIM [2]

- site-info.def
  - Main configuration input source
  - Contains proper paths to all other configuration files
  - Information available at:
    - https://twiki.cern.ch/twiki/bin/view/LCG/Site-info_configuration_variables#site_info_def
- groups.conf
  - Defines groups per VO

Configuration via YAIM [3]

- users.conf
  - Defines UNIX pool users for each Virtual Organization
  - Useful script at http://www.aegis.rs/grid/generate-pool-accounts-AEGIS-v4
  - Example:

    ./generate-pool-accounts-AEGIS-v4 seegrid 20000 seegrid 2000 200 10 10 >> users.conf

Configuration via YAIM [4]

- wn-list.conf
  - defines the list of WN hostnames (FQDN) in the site.
- vo.d
  - Directory containing a file per each supported VO
- CREAM CE YAIM variables:
  - https://twiki.cern.ch/twiki/bin/view/LCG/Site-info_configuration_variables#cream_CE.
- Site BDII YAIM variables:
  - https://twiki.cern.ch/twiki/bin/view/LCG/Site-info_configuration_variables#BDII

Configuration via YAIM [5]

- YAIM invocation command for CREAM CE/ BDII_site combination:
  - When CREAM is TORQUE server:

  # /opt/glite/yaim/bin/yaim -c -s site-info.def -n BDII_site -n creamCE -n TORQUE_server -n TORQUE_utils

  - When CREAM is not a TORQUE server:

  # /opt/glite/yaim/bin/yaim -c -s ./site-info.def -n BDII_site -n creamCE -n TORQUE_utils
- In case that YAIM returns an error anywhere in the procedure, check data in site-info.def and other input files and restart YAIM

Authorization model

- The CREAM CE can be configured to use as authorization system:
  - the ARGUS authorization framework
  - the grid Java Authorization Framework (gJAF)
- If gJAF should be used as authorization system, YAIM variable USE_ARGUS must be set in the following way:
  - USE_ARGUS=no

BLAH Blparser deployment model

- The BLAH Blparser is the component of the CREAM CE responsible to notify CREAM about job status changes.
- For LSF and PBS/Torque it is possible to configure the BLAH blparser in two possible ways:
  - The new BLAH BLparser, which relies on the status/history batch system commands
  - The old BLAH BLparser, which parses the batch system log files
- To use the new BLAH blparser, it is just necessary to set:
  - BLPARSER_WITH_UPDATER_NOTIFIER=true

SSH configuration

- Hostbased authentication among WNs needs to be established
- This is especially important if Grid site supports MPI
- Put all relevant FQDNs into /etc/ssh/shosts.equiv
- A standard procedure for hostbased SSH
- Identical procedure applies to all WNs

Munge

- Create the munge key /etc/munge/munge.key on the Torque server and distribute it to every host of the cluster:

  # /usr/sbin/create-munge-key

- Permissions should be adjusted and service started:

  # chown munge:munge /etc/munge/munge.key

  # chkconfig munge on

  # /etc/init.d/munge restart

MAUI cofiguration

- Edit MAUI configuration(/var/spool/maui/maui.cfg):

```
QOSCFG[qossam] MAXPROC=2 PRIORITY=100000
GROUPCFG[ops] QDEF=qossam PRIORITY=100000

SRCFG[samreservation] STARTTIME=00:00:00 ENDTIME=24:00:00
SRCFG[samreservation] PERIOD=INFINITY
SRCFG[samreservation] TASKCOUNT=1 RESOURCES=PROCS:2
SRCFG[samreservation] GROUPLIST=ops
SRCFG[samreservation] QOSLIST=qossam
SRCFG[samreservation] HOSTLIST=wn01-demo.ipb.ac.rs
```

- If maui.cfg is modified, restart it:

```
# /etc/init.d/maui restart
```

Issues

- List od common CREAM CE issues can be found at:
  - https://wiki.italiangrid.it/twiki/bin/view/CREAM/KnownIssues
- Important issues:
  - https://wiki.italiangrid.it/twiki/bin/view/CREAM/KnownIssues#Problem_by_submitting_jobs_via_W
  - https://wiki.italiangrid.it/twiki/bin/view/CREAM/KnownIssues#Error_parsing_GLUE2PolicyRule

Information system query

- Query resource

  # ldapsearch -x -H ldap://<resource_host>:2170 -b mds-vo-name=resource,o=grid

- Query site-level BDII

  # ldapsearch -x -H ldap://<site_bdii_host>:2170 -b mds-vo-name=<SITE_NAME>,o=grid

- Query top-level BDII

  # ldapsearch -x -H ldap://<top_bdii_host>:2170 -b mds-vo-name=local,o=grid

Testing configured system [1]

- Verify local batching system
  - $qmgr -c "print server“
- Tune batch queues
  - Example: http://www.aegis.rs/grid/tune-queues
- Try to submit a simple job with qsub as a pool account user on the CREAM CE
- Delegate a proxy:

  # glite-ce-delegate-proxy -e cream.ipb.ac.rs myid
- Try a gsiftp towards that CREAM CE:

globus-url-copy gsiftp://<hostname-of-cream-ce>/etc/fstab -

Testing configured system [2]

- Submit a simple job:

  # glite-ce-job-submit -D myid –r cream.ipb.ac.rs:8443/cream-pbs-creamcert1 test.jdl

where the jdl contains:

```
[
Executable = "script.sh";
StdOutput = "stdout.txt";
StdError = "stderror.txt";
InputSandbox = {"script.sh"};
OutputSandbox = {"stdout.txt","stderror.txt"};
OutputSandboxBaseDestUri = "gsiftp://localhost";
]
```

Testing configured system [3]

- $ cat script.sh

/bin/hostname

/bin/date

/bin/pwd

- Check job status

]$ glite-ce-job-status https://cream.ipb.ac.rs:8443/CREAM417022425

JobID=[https://cream.ipb.ac.rs:8443/CREAM417022425]

Status = [DONE-OK]

ExitCode = [0]

- Retrieve job output

$ glite-ce-job-output https://cream.ipb.ac.rs:8443/CREAM417022425

2012-11-23 00:01:05,135 INFO - For JobID [https://cream.ipb.ac.rs:8443/CREAM417022425] output will be stored in the dir [./cream.ipb.ac.rs_8443_CREAM417022425

Links [1]

- System Administrator Guide for CREAM for EMI-2 release:
  - https://wiki.italiangrid.it/twiki/bin/view/CREAM/SystemAdministratorGuideForEMI2
- General UMD-2 instructions:
  - http://repository.egi.eu/category/umd_releases/distribution/umd-2/
- Generic Installation & Configuration for EMI 2:
  - https://twiki.cern.ch/twiki/bin/view/EMI/GenericInstallationConfigurationEMI2
- EMI 2 CREAM page:
  - http://www.eu-emi.eu/emi-2-matterhorn-products/-/asset_publisher/B4Rk/content/cream-2

Links [2]

- CREAM CE Web site:
  - https://wiki.italiangrid.it/CREAM
- EMI 2 site BDII installation and configuration:
  - https://indico.egi.eu/indico/materialDisplay.py?contribId=319&sessionId=64&materialId=slides&confId=1019
- Configuring EMI services through YAIM:
  - https://indico.egi.eu/indico/materialDisplay.py?contribId=318&sessionId=64&materialId=slides&confId=1019
- CREAM installation, configuration and troubleshooting:
  - https://indico.egi.eu/indico/materialDisplay.py?contribId=317&sessionId=64&materialId=slides&confId=1019
- YAIM guide
  - https://twiki.cern.ch/twiki/bin/view/LCG/YaimGuide400