WMS & LB Installation

Giuseppe La Rocca
INFN Catania - Italy

First Latin American Workshop for Grid Administrators
21-25 November 2005

Outline

- What is a Workload Management System (WMS) ?
- How to install it
- How to configure
- Possible troubles…

What is a WMS?

- The WMS comprises a set of grid components responsible for the distribuition and management of tasks accross grid resources.
- The core of the WMS is the **Workload Manager (WM)** whose purpose *is to accept and satisfy requests for job management coming for its clients*.
- Requests are specified through JDL files using **ClassAd**.
- WM, taken a valid request, chooses the most appropriate action to satisfy it.
- Its main task is individuating the best suitable resources (CE, SE…).

Installing WMS + LB

Installation

- Start from a fresh install of SLC 3.0.4
- Installation via
  - Installer script (http://glite.web.cern.ch/glite/packages)
  - APT http://glite.web.cern.ch/glite/packages/APT.asp
- Installation will install all dependencies, including
  - other necessary gLite modules
  - external dependencies
- JAVA is not included in distribution. Install it separately (>= 1.4.2_06)
  http://java.sun.com/j2se/1.4.2/download.html

Installing pre-requisites

- Request host certificates for WMS.
  - https://gilda.ct.infn.it/CA/mgt/restricted/srvreq.php
- Install host certificate (hostcert.pem and hostkey.pem) in **/etc/grid-certificates**.
  - *chmod 644 hostcert.pem*
  - *chmod 400 hostkey.pem*

- If planning to use certificates released by unsupported EGEE CA's, be sure that their public key and CRLs (usually distributed with an rpm) are installed.
  - The CRL of the VO GILDA are available from

https://gilda.ct.infn.it/RPMS/ca_GILDA-0.28.1.i386.rpm

Installing WMS+LB via apt

1. **Verify if apt is present:**
   - **rpm -qa | grep apt**
   - **Install apt if necessary:**
     - **rpm -ivh** http://linuxsoft.cern.ch/cern/slc30X/i386/SL/RPMS/apt-0.5.15cnc6-8.SL.cern.i386.rpm

2. **Add gLite apt repository:**
   - Put one this line in a file (e.g. glite.list) inside the /etc/apt/sources.list.d directory (R 1.4)
   - `rpm http://glitesoft.cern.ch/EGEE/gLite/APT/R1.4/ rhel30 externals Release1.4 updates`
   - `apt-get update`
   - `apt-get upgrade`

3. **Install WMS+LB:**
   - `apt-get install glite-wms-config`
   - `apt-get install glite-lb-config`

See http://glite.web.cern.ch/glite/packages/APT.asp

Installing WMS+LB via apt (cont.)

- **If the installation is performed successfully, the following components are installed:**
  - *gLite in /opt/glite*
  - *Condor in /opt/condor-x.y.x (where x.y.z is the current condor version)*
  - *Globus in /opt/globus*
  - *MySQL in /usr/bin/mysql*

WMS Configuration

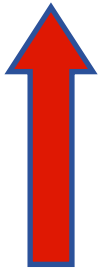
- Configuration comes through the execution of pyhton scripts, which takes as input xml files.
- So services have to be configured by editing these xml files.
- Attributes in xml file are well commented and self-explaining.
- XML files are provided as templates, under /opt/glite/etc/config/templates
- Copy templates file to /opt/glite/etc/config
- Edit each of them separately.
- Then we could launch the configurator scripts for WMS and LB.

WMS Configuration (cont.)

- **List of XML files to configure:**
  - glite-global.cfg.xml
  - glite-wms.cfg.xml
  - glite-lb.cfg.xml
  - glite-rgma-client.cfg.xml
  - glite-rgma-common.cfg.xml
  - glite-rgma-servicetool.cfg.xml
  - glite-rgma-servicetool-serviceName.cfg.xml
  - glite-service-discovery.cfg.xml
  - glite-service-discovery.file-based-example.cfg.xml
  - glite-security-utils.cfg.xml

glite-global.cfg.xml

<JAVA_HOME description="Environment variable pointing to the SUN Java JRE or J2SE package for example '/usr/java/j2re1.4.2_08/' or '$JAVA_HOME' (if it is defined as an environment variable)" value="/usr/java/j2re-1.4.2_06"/>



Check your java package installed.

glite-wms.cfg.xml

- Here are defined some key values for the WMS daemons

glite.user.name : glite [user running glite Services]

glite.user.group : glite [user group running glite Services]

<pool.account.basename

description="The prefix of the set of pool accounts to be created for each VO.

Existing pool accounts with this prefix are not recreated">

<value>gildav</value>

<value>gilda</value>

</pool.account.basename>

glite-wms.cfg.xml (cont.)

```
<pool.account.group
  description="The group name of the pool accounts to be
   used for each VO.
  It can be left empty to use the base name as group name">
  <value>gildav</value>
  <value>gilda</value>
</pool.account.group>

 <pool.account.number
description="The number of pool accounts to create for each
   VO. Each account will be created with a username of the
   form prefixXXX where prefix is the value of the
   pool.account.basename parameter. ...">
   <value>50</value>
   <value>50</value>
 </pool.account.number>
```

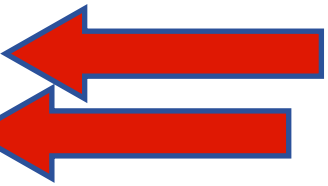
glite-wms.cfg.xml (cont.)

```
<voms.voname description="The names of the VOs
   that this WMS node can serve">
<value>gildav</value>
<value>gilda</value>
</voms.voname>

<voms.vomsnode description="The full hostname of
   the VOMS server responsible for each VO. Even if
   the same server is reponsible for more than one
   VO, there must be exactly one entry for each VO
   listed in the 'voms.voname' parameter.">
  <value>cert-voms-01.cnaf.infn.it</value>
  <value></value>
</voms.vomsnode>
```

glite-wms.cfg.xml (cont.)

```
<voms.vomsport
  description="The port on the VOMS server listening for
   request for each VO
   This is used in the vomses configuration file
   Example: 15000">
   <value>15008</value>
   <value></value>
</voms.vomsport>
```



glite-wms.cfg.xml (cont.)

<voms.vomscertsubj

description="The subject of the host certificate of the VOMS server for each VO.

Example:
/C=ORG/O=DOMAIN/OU=GRID/CN=host.domain.org">

<value>/C=IT/O=INFN/OU=Host/L=CNAF/CN=cert-voms-01.cnaf.infn.it</val

<value></value>

</voms.vomscertsubj>

glite-wms.cfg.xml (cont.)

- Also, in glite, WMS can work both in push or pull mode

  Pull mode : waiting notifications from CE's

  wms.Cemon.Port : 5120

glite-wms.cfg.xml (cont.)

<!-- WMProxy and LBProxy configuration -->

<lb.server

description="Host name and port of the Logging and Bookkeeping Server to be used by the

Workload Manager Proxy. The port is normally 9000. If LB is installed on this node together with WMS, you can leave this parameter empty or comment it out.

Example: lxb0001.cern.ch:9000"

value="grid004.ct.infn.it:9000"/>

glite-wms.cfg.xml (cont.)

```
<mysql.root.password
        description="The mysql root password"
 value="secret"/>
```

glite-wms.cfg.xml (cont.)

```
<instance name="SEIndex" service="service-
  discovery.file">

    <service-discovery.file.service_name
      value="gildaSEIndex"/>

    <service-discovery.file.url_endpoint
      value="https://grid017.ct.infn.it:8443/gilda/glite-
data-catalog-service-fr/services/SEIndex"/>
```

glite-wms.cfg.xml (cont.)

```
<!-- R-GMA Purchaser configuration -->
 <enable.purchasing.from.rgma
    description="Enable the R-GMA purchaser. If this
     parameter is set to false the other parameters are
     ignored. Example: true"
    value="false"/>

<ism.rgma.purchasing.rate
    description="ISM purchasing rate in seconds
    Example: 120"
    value="150"/>
```

glite-security-utils.cfg.xml

- Set the parameters to correctly build files needed by GSI.

- Enable fetch-crl cron-job

<install.fetch-crl.cron

description="Install the glite-fetch-crl cron job. Possible values are 'true' (install the cron job) or 'false' (do not install the cron job)"

value="true"/>

glite-security-utils.cfg.xml (cont.)

- Enable glite-mkgridmap cron-job.

<install.mkgridmap.cron
description="Install the glite-mkgridmap cron job and run it once.
Possible values are 'true' (install the cron job) or 'false' (do not install the cron job)"
value="true"/>

/opt/glite/etc/glite-mkgridmap.conf

Edit /opt/glite/etc/glite-mkgridmap.conf as follow:

```
#### GROUP: group URI [lcluser]
group vomss://cert-voms-01.cnaf.infn.it:8443/voms/gildav?/gildav .gildav
group ldap://grid-vo.cnaf.infn.it:10389/ou=Testbed-gilda,o=gilda,c=it .gilda
```

glite-lb.cfg.xml

- Configuration needs less parameters respect to WMS

<rgma.servicetool.service_type
description="The service type. This should be uniquely defined for each service type. The recommended format is the service namespace in reversed domain name format [Type: 'string']"
value="org.glite.lb.lbserver"/>

<rgma.servicetool.name
description="Name of the service. This should be globally unique.
[Example:HOSTANME_LB_LocalLogger] "
value="${HOSTNAME}_${rgma.servicetool.service_type}"/>

glite-lb.cfg.xml (cont.)

- Set MySQL password.

```
<mysql.root.password
  description="The mysql root password"
  value="secret"/>
```

glite-rgma-common.cfg.xml

<rgma.server.hostname
description="Host name of the R-GMA server.
[Example: lxb1420.cern.ch] [Type: 'string']"
value="rgmasrv.ct.infn.it"/>

<rgma.schema.hostname
description="Host name of the R-GMA schema service.
(See also configuration parameter 'rgma.server.run_schema_service'
in the R-GMA server configuration file in case you install a server).
[Example: lxb1420.cern.ch] [Type: 'string']"
value="rgmasrv.ct.infn.it"/>

glite-rgma-common.cfg.xml (cont.)

<rgma.registry.hostname

description="Host name of the R-GMA registry service.

You must specify at least one hostname and you can specify several if you want to use several registries.

(See also configuration parameter 'rgma.server.run_registry_service'

in the R-GMA server configuration file in case you install a server).

[Example: lxb2029.cern.ch] [Type:

<value>rgmasrv.ct.infn.it</value>

</rgma.registry.hostname>

glite-rgma-servicetool.cfg.xml

- Define the site name of the publisher node, generally the FQDN of the RB

<rgma.servicetool.sitename

description="DNS name of the site publisher node. This parameter must have the same value as the rgma.site-publisher.sitename parameter in the R-GMA Server configuration.

Example: lxb2029.cern.ch] [Type: 'string']"

value="**${HOSTNAME}**"/>

glite-rgma-servicetool-serviceName.cfg.xml

<rgma.servicetool.vo

description="List of VOs that this service is considered part of.

Optional parameter - you can specify one or several or it can be left empty or be removed.

[Example: EGEE] [Type: 'string']">

<value>gildav</value>

</rgma.servicetool.vo>

glite-service.discovery.cfg.xml

<service-discovery.type

description="Service discovery implementation to be used. Possible values are:

file use (static) file base service discovery

rgma use (dynamic) R-GMA based service discovery

bdii use (dynamic) BDII based service discovery

Several implementations can be specified that will be tried/used in the specified order. Example: file">

<value>file</value>

</service-discovery.type>

glite-service.discovery.file-based-example.cfg.xml

```
<instance name="FileTransferService for gildav"
    service="service-discovery.file">

<service-discovery.file.service_name
    description="The globally unique name of the service.
    The convention is serviceHost_voName_serviceType.
    serviceType is the value defined in the parameter
    service-discovery.file.service_type."
value="gildaFts"/>
```

glite-service.discovery.file-based-example.cfg.xml

<service-discovery.file.url_endpoint

description="URL endpoint of the service.

Example:https://your.serviceHostname.com:8443/your_service [Type: 'string']"

value="**https://fts.ct.infn.it:8443/gildav/glite-data-transfer-fts/services/FileTransfer**"/>

<service-discovery.file.service_version

description="Service version in the form 'major.minor.patch' of the used service. Example: 1.2.3

[Type: 'string']"

value=“”/>

Installation of VOMS Certificate

- Install the GILDA's VOMS server host certificates *gildav-cert-voms-01.cnaf.infn.it.pem* in the directory **/etc/grid-security/vomsdir**

- Edit the **/opt/glite/etc/vomses** file as follow:

  "gildav" "cert-voms-01.cnaf.infn.it" "15008" "/C=IT/O=INFN/OU=Host/L=CNAF/CN=cert-voms-01.cnaf.infn.it" "gildav"

Post configuration

- **In order to commit configuration, execute**

```
python /opt/glite/etc/config/script/glite-lb-
  config.py --configure
python /opt/glite/etc/config/script/glite-lb-
  config.py --start

python /opt/glite/etc/config/script/glite-wms-
  config.py --configure
python /opt/glite/etc/config/script/glite-wms-
  config.py --start
```

Now your WMS should be capable to accept jobs and to dispatch them to the CE's.

Publishing WMS services to R-GMA

- **In order to publish WMS services to R-GMA execute:**

```
python /opt/glite/etc/config/script/glite-
  rgma-servicetool.py --configure
python /opt/glite/etc/config/script/glite-
  rgma-servicetool.py --start
```

Bug #11631

- **bug #11631 - "The information supermarket in a 1.4 WMS is almost always empty in push mode with a production bdii."**

```
WorkloadManager = [
        ...
       EnablePurchasingFromRgma = false;
       NumberOfWorkerThreads = 1;
       Input = "${GLITE_LOCATION_VAR}/workload_manager/input.fl";
       LogFile = "${GLITE_LOCATION_LOG}/workload_manager_events.log";
       DisablePurchasingFromGris = true;
        IsmIiPurchasingRate = 150;
        IsmDumpRate = 480;
   ];
```

/opt/glite/etc/init.d/glite-wms-wm restart

Bug #10058

- **bug #10058 - "After upgrading the WMS from 1.2 to 1,3 an error occurs when starting up the service."**

apt-get install mod_ssl

Installing cron job

- Copy in **/etc/cron.daily** the script *ntpsink.sh*

```
ntpdate ntp-1.infn.it
```

- Add the following row in crontab

```
*/5 * * * * /root/script/clean_gridmapdir.sh
```

```
cat clean_gridmapdir.sh
#!/bin/sh
GRIDMAPDIR_PATH="/etc/grid-security/gridmapdir"
rm -f $GRIDMAPDIR_PATH/%*
```

Troubleshooting

- **UI is unable to contact NS :**
  possible reason : the user subject is not mapped

- **No resources found with `glite-job-list-match`**
  possible reason : WMS doesn't find resources
  check in glite_wms.conf that II_Contact, II_Port and Gris_Port are coherent with your II configuration.

  Many other problems could occur : ask to support !

Questions…