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The Workload Management System

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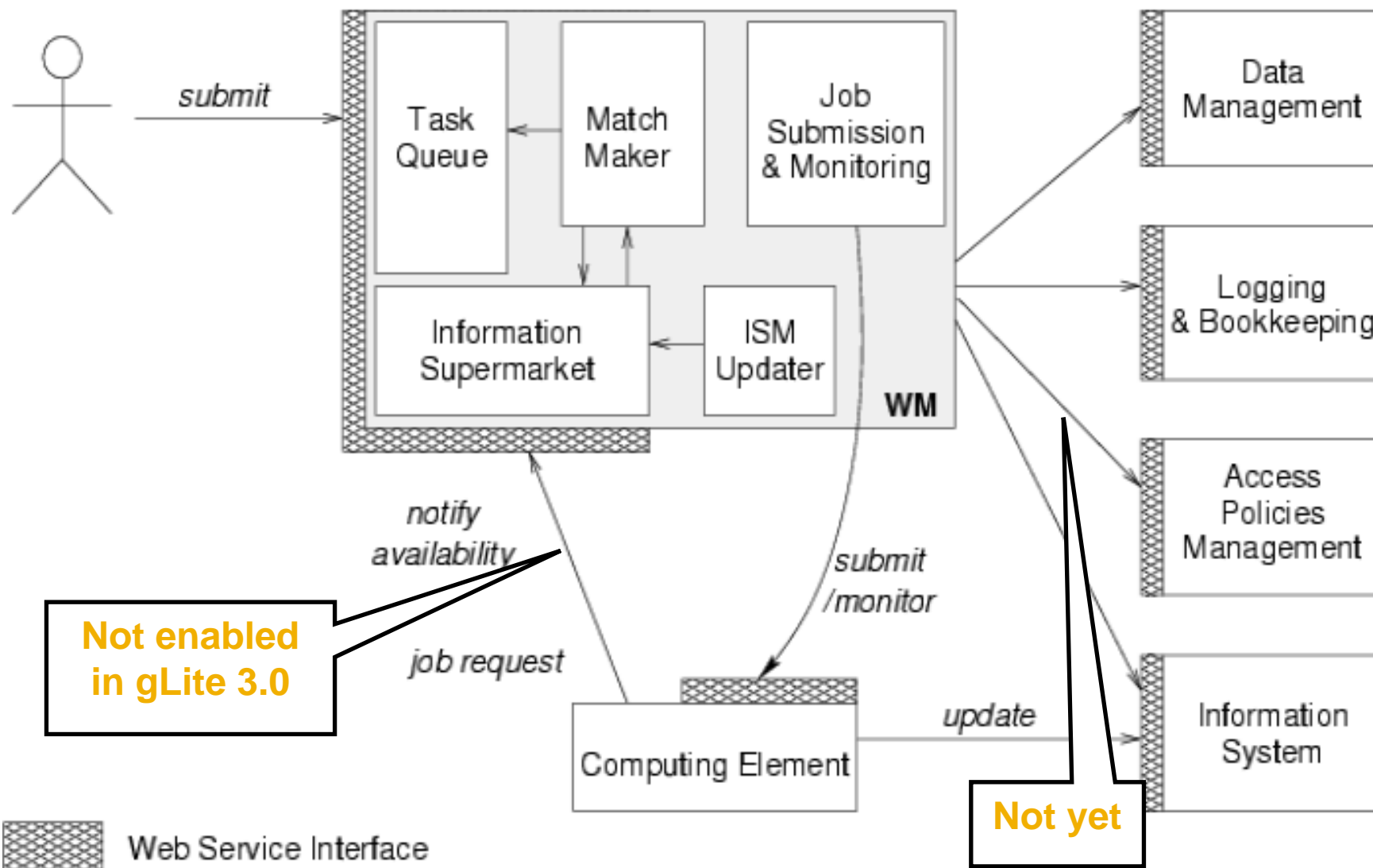
Information Society

Enabling Grids for E-sciencE

- **Introduction**

- **Installation and configuration**

- **Test your site**

- **What's wrong?**

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- **Focus on gLite job management system, specially on troubleshooting**
- **Workload Management System (WMS)**
  - Backward compatible with LCG-2
  - WMProxy
    - Web service interface to the WMS
    - Support bulk submissions and jobs with shared sandboxes
  - Support for shallow resubmission.
  - Support BDII, R-GMA and CEMon as resource information repository
  - Support for Data management interfaces (DLI and StorageIndex)
  - Support for DAG jobs
  - ……

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- **Logging and Bookkeeping (L&B)**
  - Tracks jobs during their lifetime (in terms of events)
  - L&B Proxy
    - Provides faster, synchronous and more efficient access to L&B services to Workload Management Services

- **Computing Element (CE)**
  - Service representing a computing resource
  - CE moving towards a VO based local scheduler
  - Batch Local ASCII Helper (BLAH)
    - More efficient parsing of log files (these can be left residing on a remote machine)
    - Support for hold and resume in BLAH
      To be used e.g. to put a job on hold, waiting for e.g. the staging of the input data
  - Condor-C GSI enabled
  - CE Monitor (not enabled in gLite 3.0)
    - Better support for the pull mode; More efficient handling of CEmon reporting
    - Security support

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Not enabled in gLite 3.0

Not yet

Web Service Interface

![egee - Enabling Grids for E-sciencE]

Submit job

Grid

Gatekeeper

LCAS LCMAPS

WSS

CEMon

Launch Condor-C

Not enabled in gLite 3.0

Blahpd

Condor-C

CE

LSF

PBS/ Torque

Not yet

Condor

Local batch system
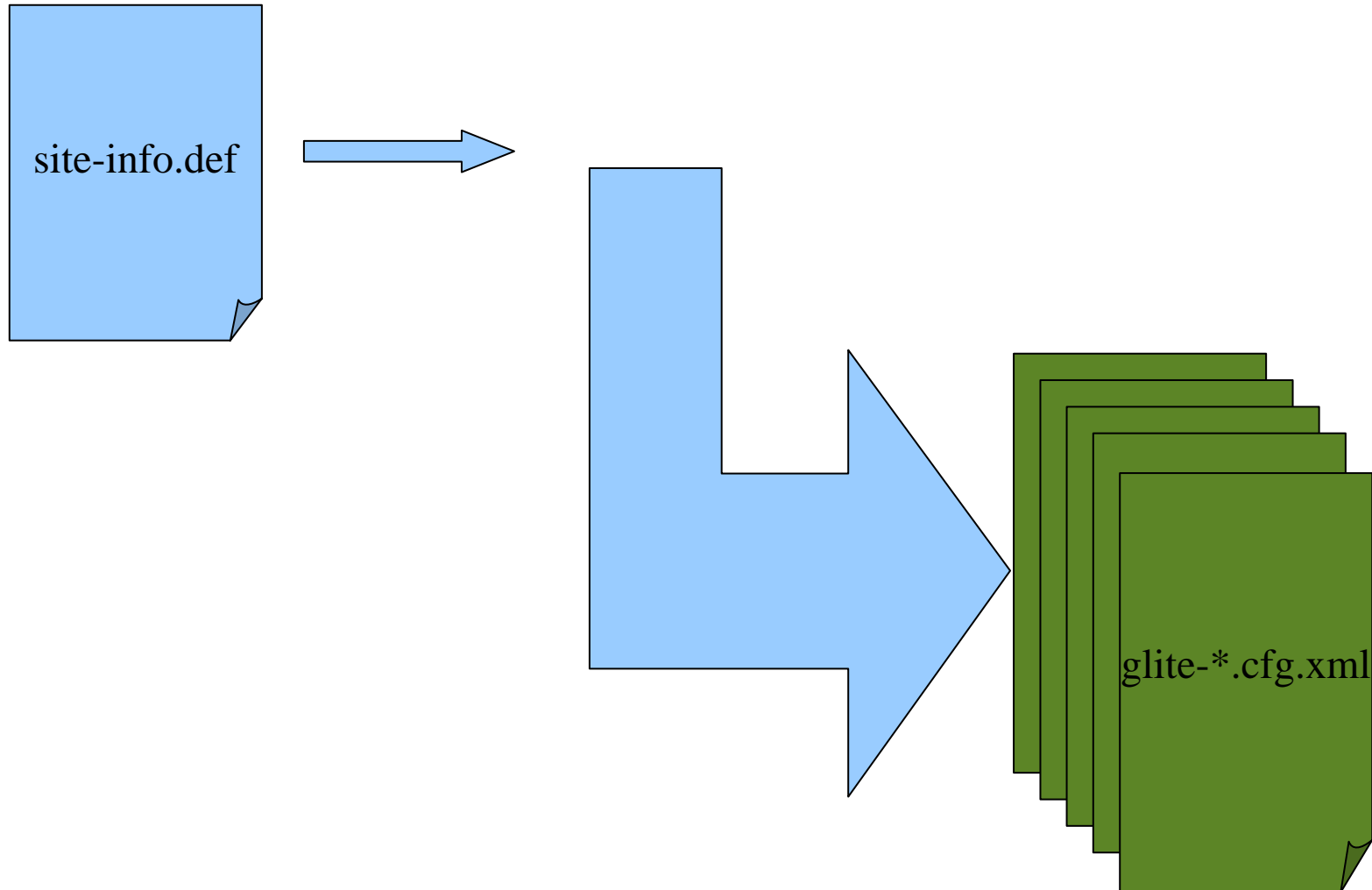
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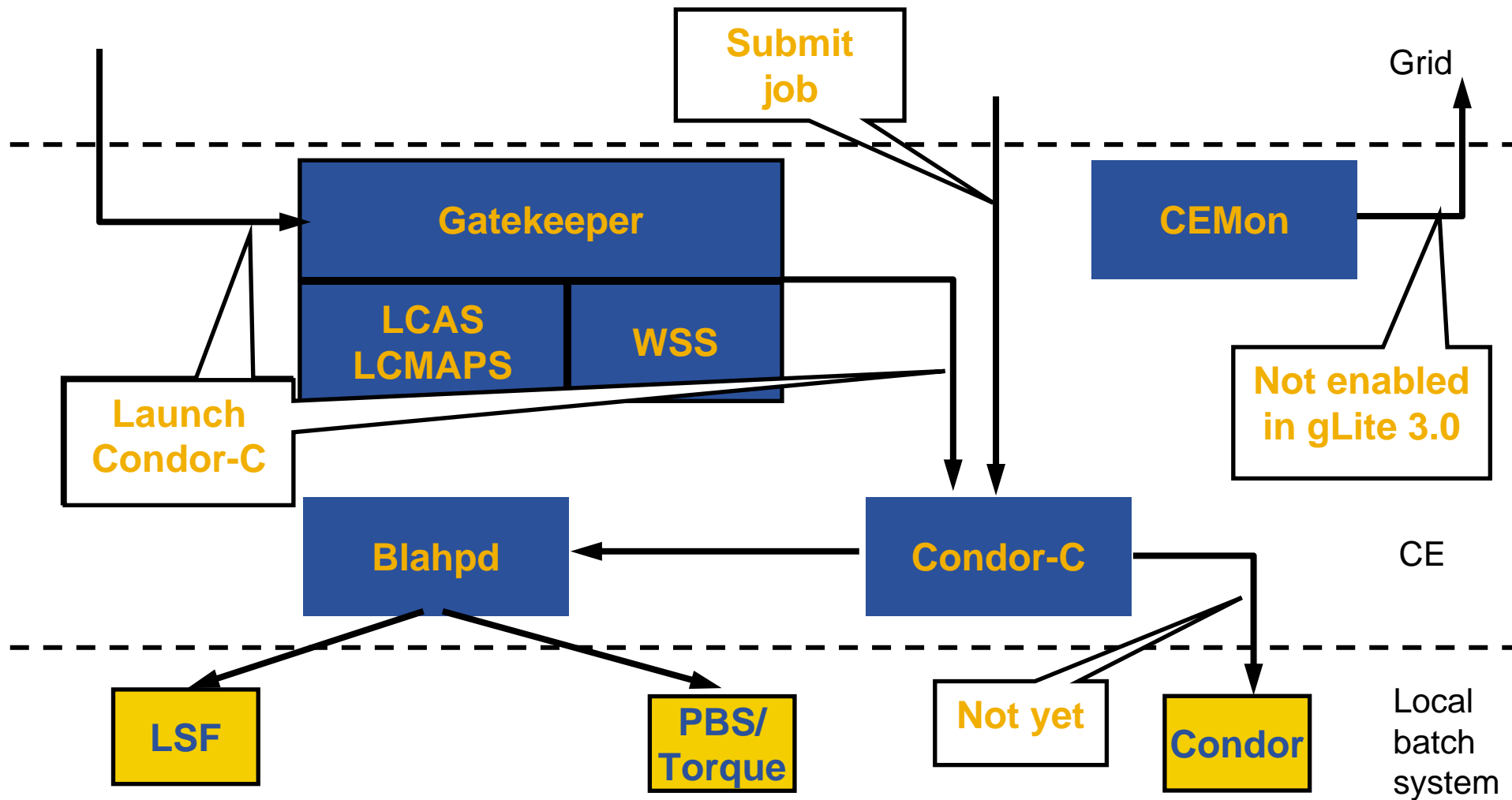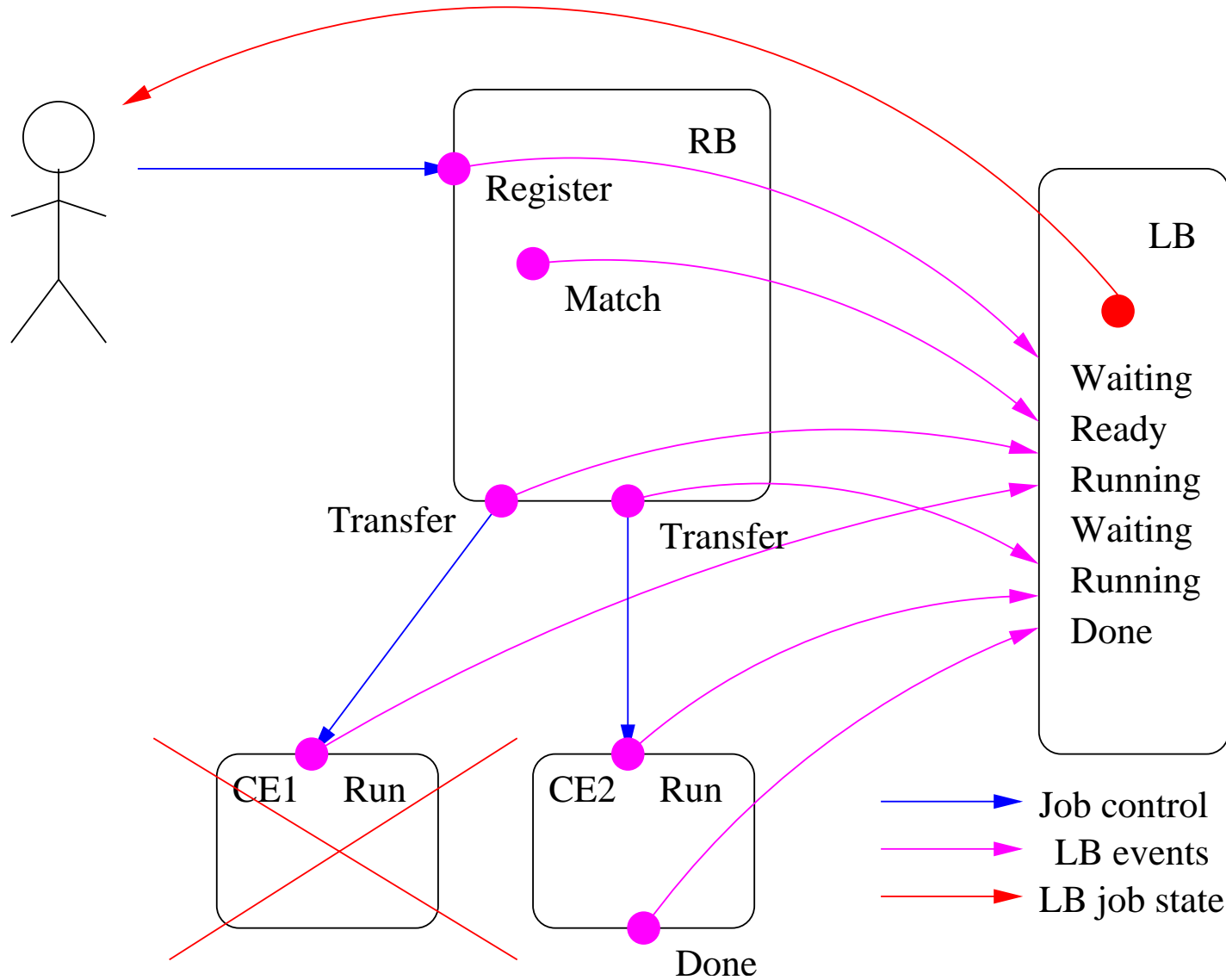
- **apt-get, yum, manual installation, tarball**

- **Architecture CPU**
  - If you have and non i386 architexture and you need to install some i386 pkg, DON'T use apt it will made the choice by the priority of the repository and not the architecture
  - Yum does not have this problem and give always the priority to the cpu arch

- **Dependencies**
  - Those tools are made to satisfy dependencies automatically.
    - **foo** is depended on **bar** which is depended on **tux** , the 3 packages will be install with just an: apt-get install foo.
  - Problems when tux is not present
    - The message will not speak about **tux** but about **bar** with the bar is not installable

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- **Try to install bar to check which package is really missing**

    – apt-get install bar

    – Then find tux from somewhere and install it by hand

- **apt-get dist-upgrade may help**

YAIM configuration of gLite services

- **gLite 3.0 is a merge of LCG 2.7.0 and gLite 1.5.0 middleware stacks**
- **Both stacks are using different configuration approaches (YAIM/gLite Python configuration system)**
- **Unification of configuration approaches.**
- **YAIM2gLiteConverter: tool to transform YAIM configuration values to gLite XML configuration files**
- **Transparent configuration of gLite services**
- **No additional administrative overhead**
- **For example, configure_node <site-info.def> WMS**
  - Function config-glite-wms
    - Call YAIM2gLiteConvertor (parameter transformation)
    - Call glite-wms-config.py --config (service configuration)
    - Call glite-wms-config.py --start (service startup)

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site-info.def

glite-*.cfg.xml

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- **YAIM parameters are read from site-info.def file**
- **gLite XML files are updated.**
  - With new parameters from template files (new feature from glite-yaim-3.0.0-18)
  - Parameter values are:
    - mapped to their YAIM equivalents
    - derived from YAIM parameters
    - defaulted
- **Necessary structures are created**
- **gLite parameters not managed by YAIM are not modified by converter !**

- **Important places**
  - `${INSTALL_ROOT}/glite/etc/config/glite-*.cfg.xml` modified/updated XML files. To verify if the conversion was O.K.
  - If you have doubts that the conversion was not O.K. and you don't have any modified parameters, the simplest solution is: `# rm -f ${INSTALL_ROOT}/glite/etc/config/glite-*.cfg.xml` (normally not needed)
  - `${INSTALL_ROOT}/glite/yaim/libexec/` Code of the YAIM2gLiteConvertor, support files (parameter mapping, defaults, container definitions). **!!! Please NEVER change these files. Instead, submit a bug !!!**

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- **Started from gLite 3.0, glite CE only supports voms proxy**

- **Test gatekeeper**
  - globus-job-run <yourCE> /bin/pwd
    - Submit job to jobmanger-fork
    - other jobmanagers for batch system don't exist since gLite 3.0 uses condor-c to submit jobs to batch system with blah
  - Something wrong?
    - grid-mapfile should contain only VOMS group and roles

    > "/atlas/Role=production/Capability=NULL" atlasprd
    >
    > "/atlas/Role=NULL/Capability=NULL" .atlas
    >
    > "/atlas" .atlas
    >
    > . . . .

    - lcas and lcmaps correctly configured?
    - hostkey readonly, time synchronization,vo membership, certificate expire?
    - Check logs in file /var/log/glite/gatekeeper

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- **Test your batch system**
  - Test job submission by batch system command like qsub for torque on CE as a pool account
  - ssh problem from WN to CE?
    - When a WN reinstalled, suggest to remove shosts.equiv and ssh_known_hosts files from /etc/ssh directory on the CE and rerun /opt/edg/sbin/edg-pbs-knownhosts and /opt/edg/sbin/edg-pbs-shostsequiv

- **Check if set of condor-c daemon running or not as the VO user**
  - Condor_gridmanager log files: /tmp/GridmanagerLog.<poolaccount>
  - And /<home>/<poolaccount>/Condor_glidein/

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- **Test BLAH job execution**
  - As pool account, run /opt/glite/bin/blahpd and type

```
ASYNC_MODE_ON

COMMANDS

BLAH_JOB_SUBMIT 23 [cmd="/bin/date";out="/tmp/out";gridtype="pbs"];
quit
```

  - Check /tmp/out if it is correct
  - If it failed, check if BLParser is running on batch system head node like:
    - /opt/glite/bin/BLParserPBS -p 33332 -s <location of log> for PBS
    - /opt/glite/bin/BLParserLSF -p 33333 -s <location of log> for LSF
    - Port may be different.
  - pbs_submit.sh, pbs_status.sh,lsf_submit.sh,lsf_status.sh
  - http://egee-jra1-wm.mi.infn.it/egee-jra1-wm/ce_blahp.shtml
- **Test your CE through WMS**
  - If your CE is not in information system, try "-r" option
    - glite-job-submit –r <yource>:2119/blah-pbs-dteam your.jdl

- **Create a very simple JDL, glite-job-list-match to check your network server and workload server**
  - For WMSProxy, it's glite-wms-list-match
  - If no resource matched, check /var/glite/workload_manager/ismdump.fl
  - If it's empty, check if you can contact the BDII defined in /opt/glite/etc/glite_wms.conf
- **Submit the job by glite-job-submit**
  - For WMSProxy, it's glite-wms-job-submit
  - glite-job-status <jobid>
    - Or glite-wms-job-status with WMSProxy interface
    - Check the job status
  - glite-job-logging-info (glite-wms-job-logging-info for WMSProxy) can give more information and also verify LB services

- **On WMS, Condor commands can be used to query the status of your jobs in condor queue, for example, like**

  - "condor_q –long" gives verbose output about the jobs

  - "condor_q –global" shows also the status of jobs on CE

- **Instead, condor_status display the status of the Condor pool, like**

  - "condor_status –schedd" shows the atribute including total running jobs of schedds for example the condor schedd on glite CE

- **And others: condor_history, …**

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- **"/etc/init.d/gLite status" will give the status of all services**
  - For individual service, try the daemon script under /opt/glite/etc/init.d/

- **You can find most of log info under /var/log/glite/**

- **But for LB and proxy renewal services, the log messages are in /var/log/message**

- **The log info of CondorG normally is in /var/glite/logmonitor/CondorG.log**

- **And you can also find the logs for Condor-c under /var/local/condor/log/**

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- **Error while calling the "NSClient::multi" native api AuthenticationException: Failed to establish security context...**
  - Check if your DN is in the grid-mapfile on WMS
  - Restart network server (possibly)
- **Many jobs stay in running or ready status for ever**
  - Probably logmonitor daemon dead and could not be restarted
  - Restart logmonitor by hand
- **glite-job-logging-info shows "Cannot take token!"**
  - Check if edg-gridftp-clients or glite-gridftp-clients package installed on WN
  - Check if you can globur-url-copy files to and from WMS on WNs
  - Proxy expired before job executing and could not be renewed

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- **When gLite CE installed from scratch, your first job to your CE may fail.**
  - Don't "panic", try few more jobs
  - It is believed to be a bug of Condor, and newer version of condor should solve the problem

- **"Got a job held event, reason: Spooling input data files"**
  - It may fail with "Globus error 7: authentication with the remote server failed"
  - Race condition between the gridmanager on machine A querying the job status of the job on machine B and the schedd on machine B releasing the job after file stage-in, fixed in later version of condor.

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- **glite-job-logging-info shows: Cannot read JobWrapper output, both from Condor and from Maradona.**
  - Similar to LCG workload management system, more info on http://goc.grid.sinica.edu.tw/gocwiki

- **glite-job-logging-info shows: Got a job held event, reason: "The PeriodicHold expression 'Matched =!= TRUE && CurrentTime > QDate + 900' evaluated to TRUE"**
  - Condor could not submit the job to CE in more than 900 seconds
  - Probably Condor-C on CE could not be launched because authentication failed
  - Possibly because of firewall

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- **Glite-job-logging-info shows "Got a job held event, reason: Error connecting to schedd …"**
  - Condor met timeout when connecting sched for on gLite CE
  - Possibly because of unstable network, or a disk fills up somewhere

- **Glite-job-logging-info shows "Got a job held event, reason: Attempts to submit failed"**
  - It means that the job could not be successfully handed over to the batch system by the non-privileged user that resulted from the GRAM/LCMAPS mapping
  - For example, BLParser not running on batch system head node

- **Thank Louis Poncet for the slides of installation part**
- **Thank Robert for the slides of configuration part**
- **http://goc.grid.sinica.edu.tw/gocwiki/** **is useful, but we need to add and update documentations for gLite job management system, and your contributions are welcome.**
- **Questions?**