Information providers for CREAM An opportunity for harmonization ?

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Introduction

- Problem in CREAM wrt batch system information providers

- To explain the problem I will have to explain first how the whole stuff works in the CREAM CE ...

- ... and eventually the dream
  - Address the issue
  - Some converge between different middleware stacks
  - Remove some duplications

BDII

- Publication of Computing element related information in CREAM is done through BDII
- This information is then used by different clients, in particular by the WMS for matchmaking purposes
- BDII uses three directories to obtain information sources
  - ldif: contains static ldif files
  - plugin: contains plugin scripts run every x minutes. They are supposed to provide dynamic information that should "overwrite" the information written in the static ldif files
  - provider: contains information provider scripts, run every x minutes
- Normal use
  - If all the information is static, you use static ldif file(s)
  - If a few attributes are dynamic you use static file(s) plus plugins
  - If many attributes are dynamic, you use a provider that does everything

CREAM and BDII

- Static ldif files created by yaim-cream-ce
  - Glue1 and Glue2 objectclasses
    - GlueCE, GlueVOView, GlueCluster, GlueSubcluster, Glue2ComputingService, Glue2ComputingEndpoint, Glue2ComputingShare, …
    - No info about jobs
  - Most of the values to be used in these ldif files are read by a yaim site specific configuration file (siteinfo.def)
    - In most of the cases it is not possible to automatically detect the information
      - E.g. info related to hardware characteristics, since yaim is run on the CE node, that can be different wrt the WNs
- Plugins for dynamic values
  - See next slides
- Providers
  - For information related to services
    - CEMon, RTEPublisher

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GlueCE and GlueVOView

dn: GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest1,mds-vo-name=resource,o=grid

GlueCEUniqueID: cream-35.pd.infn.it:8443/cream-lsf-creamtest1

GlueCEHostingCluster: cream-35.pd.infn.it

GlueCEName: creamtest1

GlueCEImplementationName: CREAM

GlueCEImplementationVersion: 1.13.1

GlueCEInfoGatekeeperPort: 8443

GlueCEInfoHostName: cream-35.pd.infn.it

GlueCEInfoLRMSType: lsf

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dn: GlueVOViewLocalID=infngrid,GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest1,mds-vo-name=resource,o=grid

GlueVOViewLocalID: infngrid

GlueCEStateRunningJobs: 0

GlueCEStateWaitingJobs: 444444

GlueCEStateTotalJobs: 0

GlueCEStateFreeJobSlots: 0

GlueCEStateEstimatedResponseTime: 2146660842

GlueCEStateWorstResponseTime: 2146660842

GlueCEInfoDefaultSE: gridit002.pd.infn.it

GlueCEInfoApplicationDir: /opt/exp_soft/infngrid

GlueCEInfoDataDir: unset

GlueChunkKey: GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest1

GlueCEAccessControlBaseRule: VO:infngrid

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BDII plugins in CREAM

- Dynamic software plugin
  - Publishes the ApplicationSoftwareRunTimeEnvironment attributes for the Subcluster objectclass

- Batch system dynamic plugin
  - Publishes dynamic information related to the batch system
  - This information overwrites the info written in the static LDIF files

- Generic scheduler plugin
  - Publishes in particular VOView related information
  - Uses as input also information provided by batch system specific scripts

Example of batch system plugin output

dn: GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest1,mds-vo-name=resource,o=grid
GlueCEInfoLRMSVersion: 7 Update 5
GlueCEInfoTotalCPUs: 144
GlueCEPolicyAssignedJobSlots: 144
GlueCEPolicyMaxRunningJobs: 144
GlueCEPolicyMaxCPUTime: 9999999999
GlueCEPolicyMaxWallClockTime: 9999999999
GlueCEPolicyPriority: -20
GlueCEStateFreeCPUs: 14
GlueCEStateFreeJobSlots: 140
GlueCEStateStatus: Production

dn: GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest2,mds-vo-name=resource,o=grid
GlueCEInfoLRMSVersion: 7 Update 5
GlueCEInfoTotalCPUs: 144
GlueCEPolicyAssignedJobSlots: 144
GlueCEPolicyMaxRunningJobs: 144
GlueCEPolicyMaxCPUTime: 9999999999
GlueCEPolicyMaxWallClockTime: 9999999999
GlueCEPolicyPriority: -20
GlueCEStateFreeCPUs: 14
GlueCEStateFreeJobSlots: 140
GlueCEStateStatus: Production

Example of generic scheduler plugin output

```
dn: GlueVOViewLocalID=dteam,GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest1,mds-vo-\
name=resource,o=grid
GlueVOViewLocalID: dteam
GlueCEStateRunningJobs: 0
GlueCEStateWaitingJobs: 0
GlueCEStateTotalJobs: 0
GlueCEStateFreeJobSlots: 0
GlueCEStateEstimatedResponseTime: 3951306
GlueCEStateWorstResponseTime: 2146060842

dn: GlueVOViewLocalID=dteam,GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest2,mds-vo-\
name=resource,o=grid
GlueVOViewLocalID: dteam
GlueCEStateRunningJobs: 8
GlueCEStateWaitingJobs: 2
GlueCEStateTotalJobs: 10
GlueCEStateFreeJobSlots: 0
GlueCEStateEstimatedResponseTime: 3951306
GlueCEStateWorstResponseTime: 2146060842

dn: GlueVOViewLocalID=infngrid,GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest1,mds-\
vo-name=resource,o=grid
GlueVOViewLocalID: infngrid
GlueCEStateRunningJobs: 0
GlueCEStateWaitingJobs: 0
GlueCEStateTotalJobs: 0
GlueCEStateFreeJobSlots: 140
GlueCEStateEstimatedResponseTime: 0
GlueCEStateWorstResponseTime: 0

dn: GlueVOViewLocalID=infngrid,GlueCEUniqueID=cream-35.pd.infn.it:8443/cream-lsf-creamtest2,mds-\
vo-name=resource,o=grid
GlueVOViewLocalID: infngrid
GlueCEStateRunningJobs: 0
GlueCEStateWaitingJobs: 0
GlueCEStateTotalJobs: 0
GlueCEStateFreeJobSlots: 140
GlueCEStateEstimatedResponseTime: 0
GlueCEStateWorstResponseTime: 0
...
```

Plugins support

- These plugins implemented and maintained by several different people belonging to different organizations
  - LSF: U. Schwickerath (Cern)
  - SGE: Cesga
  - Condor: PIC
  - Torque/PBS: NIKHEF
  - Dynamic scheduler: J. Templon (NIKHEF)
- In most of the cases they are not EMI people, and they don't feel fully committed in maintaining and evolving this stuff

How to address the issue

- Several options
  - Keep hoping that the issue will be addressed at political and managerial level
  - Live with the current scenario and hope that the best effort support is enough
  - Take fully responsibility of the info provider stuff for all batch systems
    - Manpower issues
    - No deep knowledge (and availability) of all batch systems to be supported (list not available yet)
  - Some harmonization opportunities ?

Harmonization opportunity ?

- What about trying using the ARC information providers ?
- Exercise already tried some time ago
- They can't be used as they are in gLite …
  - They don't fit too well in the BDII model (static and dynamic part)
  - Several differences between gLite and ARC
    - E.g. policies, info about jobs, support for VOView, etc etc
  - …
- … but it looks like it wouldn't be impossible to make them more general and usable also in the CREAM CE
- Is ARC interested and available to enhance their info providers so they can be used also for CREAM ?
- Is some collaboration possible ?

EUROPEAN MIDDLEWARE INITIATIVE

Thank you!