GLUE Schema: LDIF to old classad mapping

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Overview

- Motivations
- Overview of the problem
- Proposed goal for the meeting
- Status
  - Current mapping for the ReSS project
- Conclusions

Motivations

- OSG software stack includes technologies (GIP,DBII,…) to publish information about resources using the GLUE schema in LDIF format
- The ReSS project is interested in the mapping of LDIF to old classad in order to use the Condor Match Making Service as the core of the Resource Selector Service
- In general, a repository of resource information in classad format can help locate resources and describe their characteristics in an easy (flat) format

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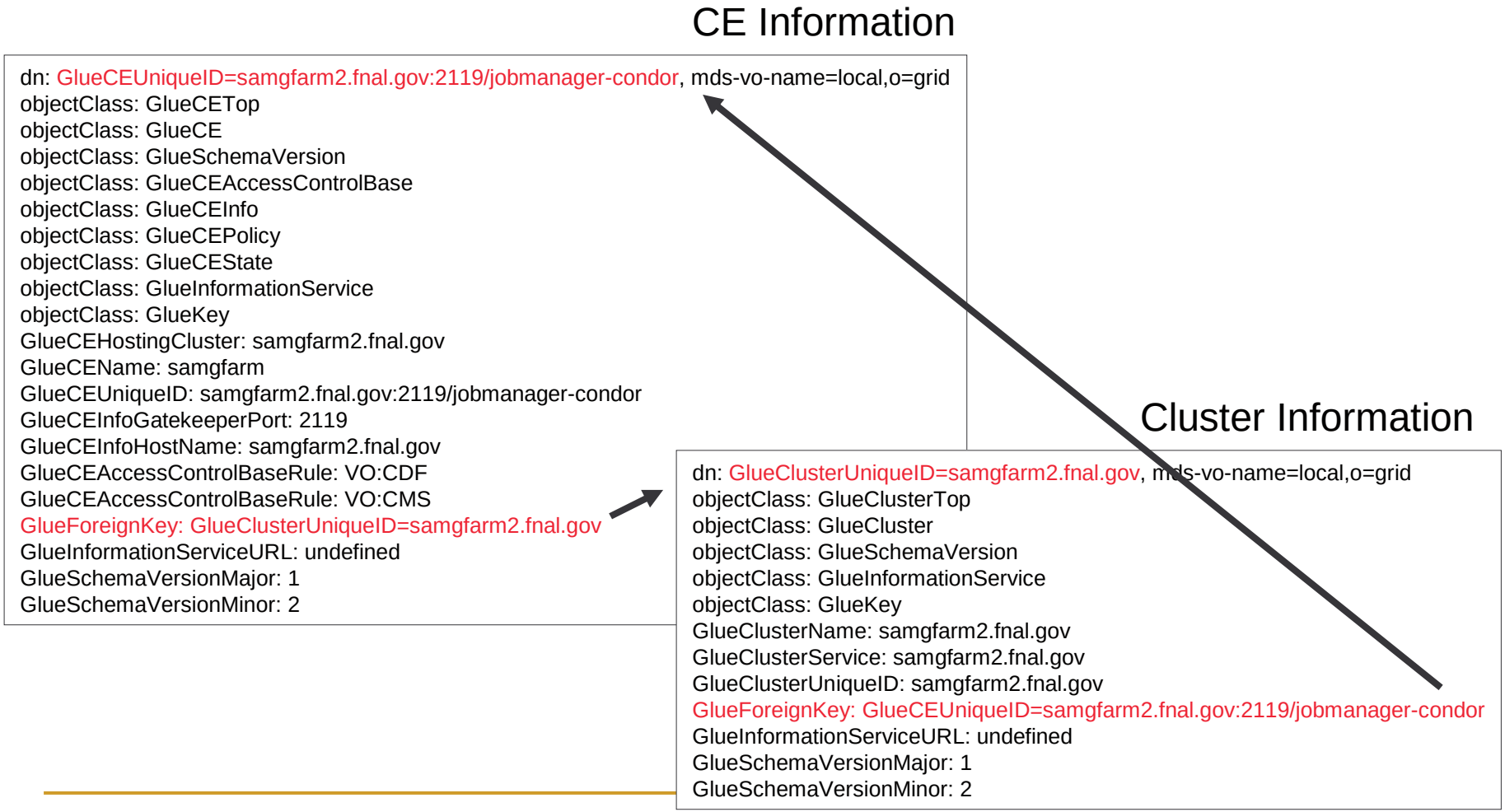
Overview of the problem (1)

- The LDIF representation of the GLUE schema organizes the information from a graph in a tree structure, using foreign keys to implement links among elements (see example)

Example: extract of GLUE in LDIF format



Overview of the problem (2)

- The old classad format is a “flat” representation
  - We want to fit the same information in a format that is less “rich” than structured formats
- The classad representation must be such that the current technologies (e.g. condor match making service) can make use of them

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Proposed goal of the meeting

- Agree on whether to write a document that describes a mapping for the GLUE schema from LDIF to old classad formats
- Agree on the content of the document
- Questions:
  - Can we express the mapping as a “set of rules” (easy to implement in a “translator” algorithm) ?
  - Can we find a mapping (set of rules?) that does not change among the different versions of GLUE currently available?
  - Should we document all the considerations that lead to the mapping (e.g. decisions imposed by the current techologies)?

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Considerations from ReSS (1)

- The ReSS project will deploy an end to end solution for resource selection on OSG for DZero
  - we currently focus on *computing* resources only (storage resources are managed by SAM in DZero)
- The ReSS project is currently forcussing on GLUE v1.1
- We'd be glad to expand our horizon!

Considerations from ReSS (2)

- We would like to define a mapping that can be used by the condor match making service for resource selection
- This means, one classad must contain all the information about one resource
  - match making happens between 1 job and 1 resource (no gang matching)
- For computing resources: one classad per CE (gatekepeer-url), per cluster, per subcluster
- In the GLUE schema the relationship between CE and cluster is many to many, the one between cluster and subcluster is one to many
  - the number of classads from a site is the product of the multiplicity of CE, clusters, and subclusters.

Status

- The ReSS project implements the current mapping using CEMon from gLite
- CEMon is deployed at each site and gathers resource information in LDIF format from the GIP
- CEMon translates the information using the “old classad dialect” plug in, then sends it to our central resource selection service
- We are working to deploy CEMon in production in OSG v0.6.0 (July 2006)

Current mapping algorithm (1)

```
from the LDIF representation of the CE
  iterate through each "dn: GlueCEUniqueID" (call them CE[i])
  For a given CE[i], iterate through each
                    "GlueForeignKey: GlueClusterUniqueID=Cluster[j]"
    For a given Cluster[j], iterate through the subclusters that have
                    "GlueChunkKey: GlueClusterUniqueID=Cluster[j]" (call it Sub[k])
      put in a classad the information from CE[i], Cluster[j], Sub[k]
```

Current mapping algorithm (2)

- We don't put GlueForeignKey as an attribute in the classads: the foreign key association is explicit in each classad
- Attributes that are repeated in LDIF should be put together as comma separated strings. Jobs requirements can match on elements of the string using ad hoc callout functions (e.g. requirements = matchString("VO:EGEE", target.GlueCEAccessControlBaseRule)
- Implement rules for “quoting” classads strings: http://osg.ivdgl.org/twiki/bin/view/ResourceSelection/QuotingOldClassad
- Java implementation of the algorithm (CEMon dialect) http://jra1mw.cvs.cern.ch:8180/cgi-bin/jra1mw.cgi/org.glite.ce.osg-ce-plugin/

Example

LDIF Format

```
dn: GlueCEUniqueID=grid005.pd.infn.it:2119/blah-lsf-grid01, mds-vo-name=local,o=grid
objectClass: GlueCETop
objectClass: GlueCE
objectClass: GlueSchemaVersion
objectClass: GlueCEAccessControlBase
objectClass: GlueCEInfo
objectClass: GlueCEPolicy
objectClass: GlueCEState
objectClass: GlueInformationService
objectClass: GlueKey
GlueSchemaVersionMajor: 1
GlueSchemaVersionMinor: 1
GlueCEHostingCluster: grid005.pd.infn.it
GlueCEName: grid01
GlueCEUniqueID: grid005.pd.infn.it:2119/blah-lsf-grid01
GlueCEInfoGatekeeperPort: 2119
GlueCEInfoHostName: grid005.pd.infn.it
GlueCEInfoLRMSType: lsf
GlueCEInfoLRMSVersion: LSF_5.1
GlueCEInfoTotalCPUs: 1
GlueCEStateEstimatedResponseTime: 0
GlueCEStateFreeCPUs: 1
GlueCEStateRunningJobs: 0
GlueCEStateStatus: Production
GlueCEStateTotalJobs: 0
GlueCEStateWaitingJobs: 0
GlueCEStateWorstResponseTime: 0
GlueCEPolicyMaxCPUTime: 172800
GlueCEPolicyMaxRunningJobs: 99999
GlueCEPolicyMaxTotalJobs: 999999
GlueCEPolicyMaxWallClockTime: 172800
GlueCEPolicyPriority: 1
GlueCEAccessControlBaseRule: VO:EGEE
GlueCEAccessControlBaseRule: VO:PROTO
GlueCEAccessControlBaseRule: VO:MASSIMO
GlueForeignKey: GlueClusterUniqueID=grid005.pd.infn.it
GlueInformationServiceURL: undefined
…
```

Old classad Format

```
GlueSchemaVersionMajor: 1
GlueSchemaVersionMinor: 1
GlueCEHostingCluster: grid005.pd.infn.it
GlueCEName: grid01
GlueCEUniqueID: grid005.pd.infn.it:2119/blah-lsf-grid01
GlueCEInfoGatekeeperPort: 2119
GlueCEInfoHostName: grid005.pd.infn.it
GlueCEInfoLRMSType: lsf
GlueCEInfoLRMSVersion: LSF_5.1
GlueCEInfoTotalCPUs: 1
GlueCEStateEstimatedResponseTime: 0
GlueCEStateFreeCPUs: 1
GlueCEStateRunningJobs: 0
GlueCEStateStatus: Production
GlueCEStateTotalJobs: 0
GlueCEStateWaitingJobs: 0
GlueCEStateWorstResponseTime: 0
GlueCEPolicyMaxCPUTime: 172800
GlueCEPolicyMaxRunningJobs: 99999
GlueCEPolicyMaxTotalJobs: 999999
GlueCEPolicyMaxWallClockTime: 172800
GlueCEPolicyPriority: 1
GlueCEAccessControlBaseRule = "VO:EGEE,VO:PROTO,VO:SGARAVATTO"
GlueForeignKey: GlueClusterUniqueID=grid005.pd.infn.it
GlueInformationServiceURL: undefined
…
```

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Conclusions

- As part of the ReSS project, we have an implementation of the GLUE LDIF to old classad mapping, which fits the DZero needs
- We do not have a formal document
- We are restricted to *computing* resources and GLUE v1.1 only
- We want to collaborate and extend this work to include other interested parties