Overview of EMI WMS

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Workflow Management

- Schedule thousands of jobs
- Varying parameter spaces and/or input data
- Simple or complex workflows (e.g., DAGs)
- Utilize multiple grid resources simultaneously
- Extend basic Globus commands
- Provide a friendlier end user experience
European Middleware Initiative

- www.eu-emi.eu/what-is-emi
- Middleware based largely on LHC activities → homogeneity of data and applications
- Harmonizes existing middleware solutions ARC + dCache + gLite + UNICORE
- Similar to OSG distribution
EMI WMS

- Workflow Management System scheduling multiple CE's from a single location
- Current version as of Oct 21, 2013, is 3.5.1, released May 21, 2013.
- Workload Manager (WM) is core component
  - Accept and satisfy requests for job management
  - Handles submission and cancellation
  - Evaluates requirements and preferences of job
  - Passes job to appropriate Compute Element (CE) for execution.
- Job Logging and Bookkeeping Service (LB)
Architecture

Source: https://web2.infn.it/gLiteWMS/index.php/techdoc/howtosandguides/57-archoverview
Using the WMS

• WMProxy service provides access to WMS through Web Services interface using CLI or UI.
  • C++ CLI
  • API for C++, Java, Python
• User obtains proxy credential: `voms-proxy-init`
• Credential is delegated to the WMProxy service
• Job is submitted using the delegated credential
• Job Description Language (JDL)
Using the WMS

- WMproxy is front end web service to WM backend infrastructure.
  - Handles external user interaction
  - Manages user proxy
- JobController backend utilizes CondorG + others
- Job info stored in MySQL
AuthN/AuthZ

• Authentication
  • X.509 Certificates and Proxies, of course

• Authorization
  • Implemented in WMProxy service via FQAN or DN in allow-deny gacl file, *glite_wms_wmproxy.gacl*
  • Can also use *Argus*
Simple JDL

[  
  Type = "Job";
  JobType = "Normal";
  Executable = "a.out";
  StdInput = "infile.txt";
  StdOutput = "outfile.txt";
  StdError = "errfile.txt";
  InputSandbox = {"infile1.txt", "/u/mynname/a.out"};
  OutputSandbox = {"outfile.txt", "errfile.txt"};
]

Submission Commands

- **Manually delegate proxy**
  
  voms-proxy-init -voms suragrid
  glite-wms-delegate-proxy -d mydelegationIDstring

- **Submit the JDL file**
  
  glite-wms-job-submit -d mydelegationIDstring -o myidsFile JDL/myjob.JDL

- **Submit Collection of JDL files from one dir**
  
  glite-wms-job-submit -d mydelegationIDstring -o myidsFile \ --collection /u/mynames/JDLcoll/

- **Monitor job status**
  
  glite-wms-job-status -i myidsFile

- **Collect Output**
  
  glite-wms-job-output -i myidsFile -dir /u/mynames/joboutput/

- **Cancel Job**
  
  glite-wms-job-cancel jobID
  glite-wms-job-cancel -i myidsFile

- **List all matching CE's for the JDL**
  
  glite-wms-job-list-match -d mydelegationIDstring -rank JDL/myjob.JDL
EMI WMS for SURAgrid?

- Uses different repo from OSG.
  - Can they coexist? Er, no, not on the same machine
  - The EMI WMS should be able to use OSG resources
- Unlike glideinWMS -
  - Does not use pilot job
  - Does not require a service or pilot account on CE
  - Does not require setuid executable to change uid
- Unlike basic CondorG or homegrown scheduler
  - Handles the selection of resources for each job
- SURAgrid would need a WMS & MyProxy server
- We might be able to use OSG BDII for info services
EMI WMS for SURAgrid?

- Users are still bound to a CLI for job control
- Additional burden of a new, but powerful, JDL
- Can this be wrapped in a web interface?
  - Creating simple submission/monitor web interface wouldn't be difficult
  - Supporting complex DAGs obviously more of a challenge
- *There still needs to be interaction between local support staff and researchers!*
Any Takers?

Q?
References

- EMI WMS User's Guide
  https://edms.cern.ch/file/674643/1/WMPROXY-guide.pdf

- gLite WMS Architecture Overview
  https://web2.infn.it/gLiteWMS/index.php/techdoc/howtosandguides/57-archoverview

- System Administrator Guide
  https://wiki.italiangrid.it/twiki/bin/view/WMS/WMSSystemAdministratorGuide

- Service Reference Card
  https://wiki.italiangrid.it/twiki/bin/view/WMS/EMIWMSFeatureRefCard

- JDL Attributes Specification
  https://edms.cern.ch/file/590869/1/WMS-JDL.pdf