



Enabling Grids for E-science

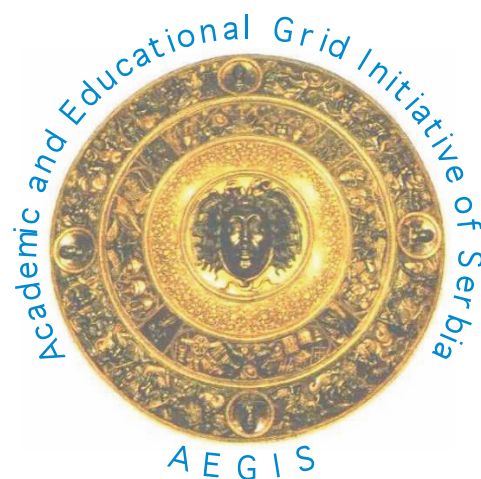
How to use computing resources at Grid

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www.eu-egee.org



SEE-GRID-SCI
SEE-GRID eInfrastructure for regional eScience



Information Society



- VO-specific information on existing Grid resources

```
lcg-infosites --vo <vo> <option> -v <verbosity> -f <site> --is <bdii>
```

- Other information on existing Grid resources

```
ldapsearch -x -h <hostname> -p 2170 -b "mds-vo-name=local, o=grid"
ldapsearch -x -H ldap://bdii.phy.bg.ac.yu:2170
    -b mds-vo-name=AEGIS01-PHY-SCL,mds-vo-name=local,o=grid
ldapsearch -x -H ldap://ce64.phy.bg.ac.yu:2170
    -b mds-vo-name=AEGIS01-PHY-SCL,o=grid
ldapsearch -x -H ldap://ce64.phy.bg.ac.yu:2170
    -b mds-vo-name=resource,o=grid
ldapsearch -x -H ldap://bdii.phy.bg.ac.yu:2170
    -b mds-vo-name=local,o=grid
    -x "GlueSAAccessControlBaseRule=aegis" GlueChunkKey
ldapsearch -x -H ldap://bdii.phy.bg.ac.yu:2170
    -b mds-vo-name=local,o=grid
    -x "GlueSAAccessControlBaseRule=aegis"
    GlueChunkKey GlueSAStateAvailableSpace
```

- **R-GMA browser web interface**

<https://lcgmon01.gridpp.rl.ac.uk:8443/R-GMA/index.html>

- **Command line interface**

```
rgma -c ''select Web from GlueSite where  
        UniqueId='ce64.phy.bg.ac.yu'''
```

- **JDL file**

attribute = expression;

- **Simple example**

```
[  
Type = "Job";  
Executable = "/bin/hostname";  
Arguments = "";  
StdOutput = "message.txt";  
StdError = "stderr";  
OutputSandbox = {"message.txt", "stderr"};  
]
```

- **Additional attributes**

```
InputSandbox = {"test.sh", "fileA", "fileB", ...}  
InputSandbox = {  
  "gsiftp://lxb0707.cern.ch/cms/doe/data/fileA", "fileB"};  
VirtualOrganisation = "cms";  
RetryCount = 0;  
MyProxyServer = "myproxy.phy.bg.ac.yu";
```

- **Requirements**

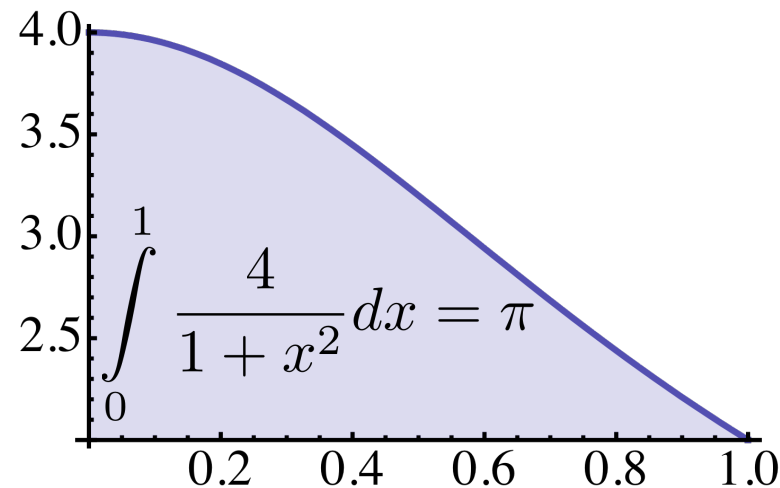
```
Requirements = RegExp("ce64.phy.bg.ac.yu*", other.GlueCEUniqueID);  
Requirements = Member("VO-cms-CMSSW_2_0_0",  
    other.GlueHostApplicationSoftwareRunTimeEnvironment);  
Requirements = (other.GlueHostArchitecturePlatformType == "x86_64");
```

- **Job Collections**
 - Type = "Collection";
- **DAG jobs (Direct Acyclic Graphs)**
 - Type = "Dag";
- **Parametric jobs**
 - JobType = "Parametric";
- **Interactive Jobs**
 - JobType = "Interactive";
- **MPI Jobs (Message Passing Interface)**
 - JobType = "MPICH";

- **Single Job Submission**

```
glite-wms-job-list-match -a <jdl file>  
glite-wms-job-delegate-proxy -d <delegID>  
glite-wms-job-submit -a <jdl file>  
glite-wms-job-status <jobID>  
glite-wms-job-cancel <jobID>  
glite-wms-job-output <jobID>  
glite-wms-job-logging-info <jobID>
```

- MPI Example



```
int number_of_intervals=300000000;

step=1.0/(double)number_of_intervals;

node_integral=0.0;
for (counter=node_id+1;counter<=number_of_intervals;
      counter=counter+number_of_nodes)
{
    x=step*((double)counter-0.5);
    node_integral=node_integral+f(x);
}
```

- **MPI JDL Example**

```
JobType = "mpich";  
NodeNumber = 3;  
Executable = "pgcc";  
StdOutput = "std.out";  
StdError = "std.err";  
InputSandbox = {"pgcc"};  
OutputSandbox = {"std.out", "std.err"};  
Requirements = (other.GlueCEInfoLRMSType == "pbs") &&  
                RegExp("ce64.phy.bg.ac.yu*", other.GlueCEUniqueID);
```

- PGI vs. GNU

```
Node: 1
Node integral: 1.047197550530024
Node: 2
Node integral: 1.047197549863390
Number of nodes: 3
Number of intervals: 1000000000
Node: 0
Node integral: 1.047197553196500
PI exact : 3.141592741012573
PI estimate: 3.141592653589914
PI diff : 0.8742265888983525E-07
```

Wall clock time: 8.765625

```
Node: 1
Node integral: 1.047197550530024
Node: 2
Node integral: 1.047197549863390
Number of nodes: 3
Number of intervals: 1000000000
Node: 0
Node integral: 1.047197553196500
PI exact : 3.141592741012573
PI estimate: 3.141592653589914
PI diff : 0.8742265888983525E-07
```

Wall clock time: 11.238281