



**EGEE Grid Hands On Training for MI-SASA Researchers**  
**Mathematical Institute of Serbian Academy of Sciences and Arts**

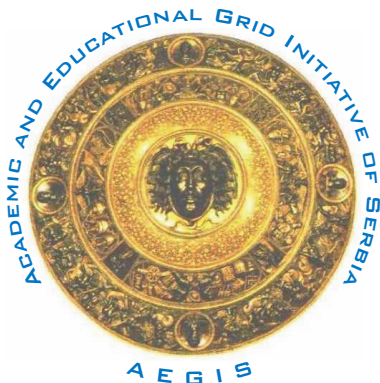
# Job Submission

*Vladimir Slavnić, [slavnic@ipb.ac.rs](mailto:slavnic@ipb.ac.rs)*  
*Scientific Computing Laboratory*  
*Institute of Physics Belgrade*  
*Serbia*

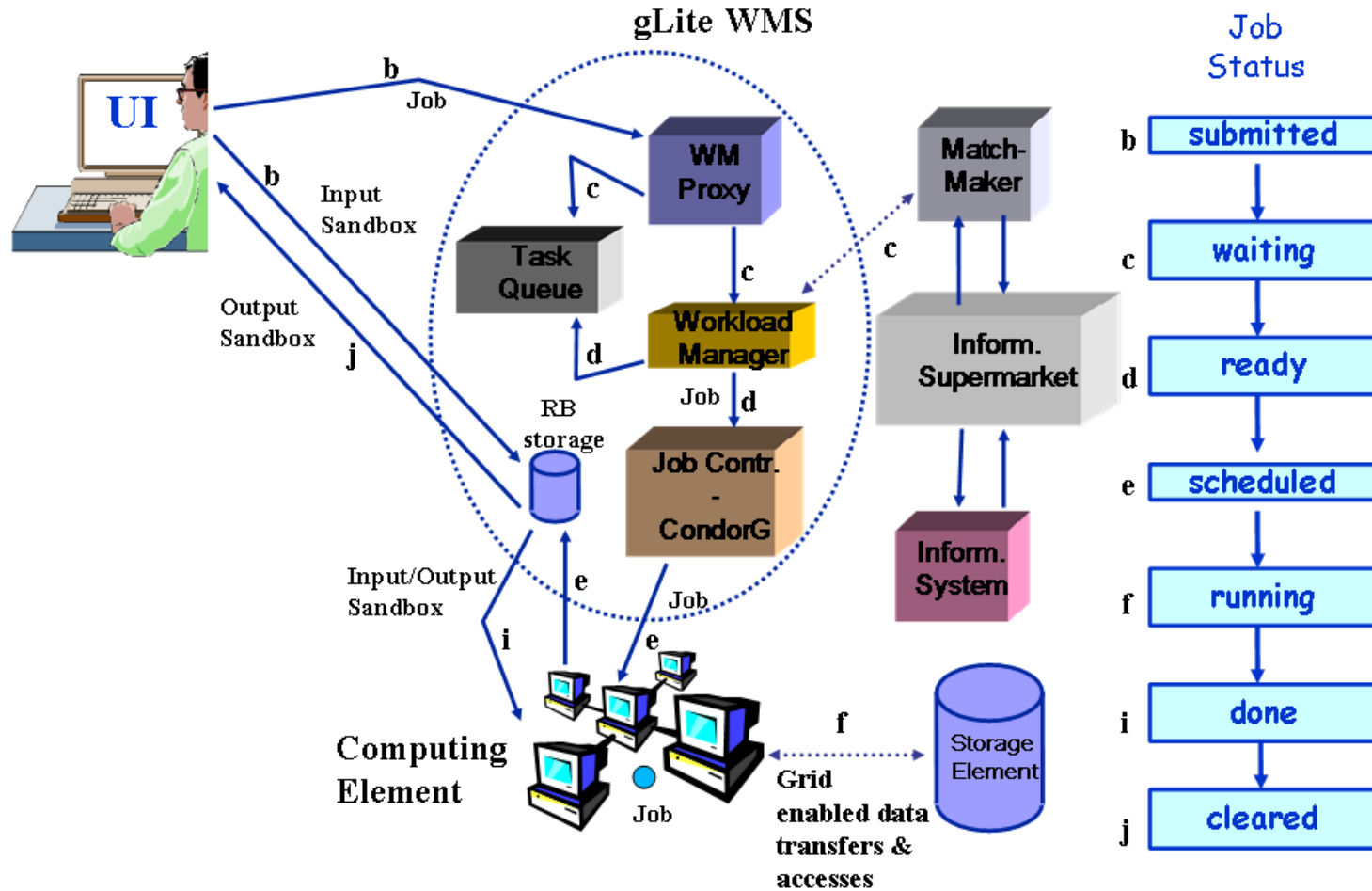


Apr. 09, 2010

[www.eu-egee.org](http://www.eu-egee.org)



- **Job workflow**
- **JDL description**
- **Single jobs**
- **Advanced jobs**



- **High-level language**

- attribute = expression;

- **Typical JDL**

- Type = "Job";

- Executable = "/bin/hostname";

- Arguments = "-d";

- StdOutput = "std.out";

- StdError = "std.err";

- OutputSandbox = {"std.out","std.err"};

- **Requirements**

Requirements = other.GlueCEPolicyMaxCPUTime > 480 &&  
other.GlueCEPolicyMaxWallClockTime > 720;

Requirements = (!RegExp("cern.ch", other.GlueCEUniqueID));

Requirements = (other.GlueHostArchitecturePlatformType  
=="x86\_64") ;

Requirements = RegExp("ce64.ipb.ac.rs\*",other.GlueCEUniqueID);

- `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>`

- **Single jobs**
- **Advanced job types**
  - Job Collections
  - DAG jobs
  - Parametric jobs
  - MPI jobs
  - Interactive Jobs
- **Examples:**
  - [http://wiki.ipb.ac.rs/index.php/Submitting\\_jobs](http://wiki.ipb.ac.rs/index.php/Submitting_jobs)
  - [https://http.ipb.ac.rs/documents/glite\\_mpi\\_user\\_guide](https://http.ipb.ac.rs/documents/glite_mpi_user_guide)

- **JDL file:**

```
Executable = "test.sh";
```

```
Arguments = "fileA fileB";
```

```
StdOutput = "std.out";
```

```
StdError = "std.err";
```

```
InputSandbox = {"test.sh", "fileA", "fileB"};
```

```
OutputSandbox = {"std.out", "std.err"};
```

- `$ cat test.sh`

```
#!/bin/sh
```

```
echo "First file:"
```

```
cat $1
```

```
echo "Second file:"
```

```
cat $2
```



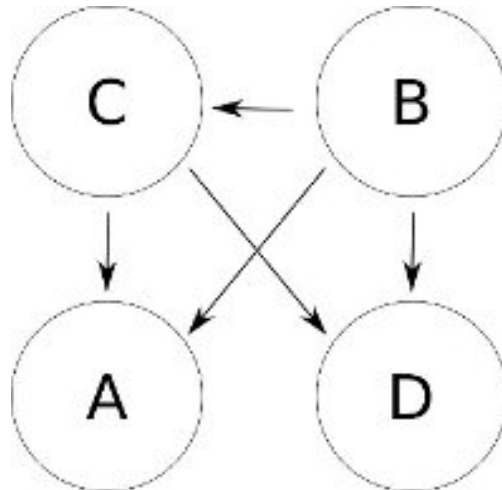
- **Sets of independent jobs**
- **Two ways to define job collection**
  - Single JDL file
  - Directory with JDL files

```

Type = "Collection";
InputSandbox = ("fileA");
Requirements = RegExp("ce64.ipb.ac.rs*",other.GlueCEUniqueID);
nodes = {
    [
        JobType = "normal";
        Executable = "/bin/hostname";
        Arguments = "-i";
        StdOutput = "out";
        InputSandbox = (root.InputSandbox, "fileB");
        StdError = "err";
        OutputSandbox = {"out","err"};
    ],
    [
        JobType = "Normal";
        Executable = "/bin/date";
        StdOutput = "date";
        StdError = "err";
        OutputSandbox = {"date"};
    ]
};

```

- **Direct Acyclic Graph**
- **Grid job workflow with job dependencies**



- **Jobs are identical - only value of a running parameter changes**

```
[  
  JobType = "Parametric";  
  Executable = "myjob.exe";  
  StdInput = "input_PARAM.txt";  
  StdOutput = "output_PARAM.txt";  
  StdError = "error_PARAM.txt";  
  Parameters = 100;  
  ParameterStart = 1;  
  ParameterStep = 1;  
  InputSandbox = {"myjob.exe", "input_PARAM.txt";  
  OutputSandbox = {"output_PARAM.txt", "error_PARAM.txt"};  
]
```

```
[  
Type = "Job";  
JobType = "Parametric";  
Executable = "/bin/echo";  
Arguments = "_PARAM_";  
Parameters = {red, green, blue};  
StdOutput = "colour_PARAM_.txt";  
StdError = "error_PARAM_.txt";  
OutputSandbox = {"colour_PARAM_.txt", "error_PARAM_.txt"};  
]
```

- **Message Passing Interface (MPI) is a commonly used standard library for parallel programming**
- **Currently, there are two standards of MPI:**
  - MPI-1
  - MPI-2
- **Number of MPI implementations:**
  - MPICH (MPI-1)
  - LAM (MPI-1)
  - MPICH2 (MPI-2)
  - OpenMPI (MPI-2)
- **gLite-WMS natively supports the submission of MPI jobs, composed of a number of processes running on different Worker Nodes, all part of the same cluster (Computing Element)**

- <https://edms.cern.ch/file/722398/1.3/gLite-3-UserGuide.pdf>
- [http://wiki.egee-see.org/index.php/Quick\\_User\\_Guide\\_for\\_Submitting\\_Jobs](http://wiki.egee-see.org/index.php/Quick_User_Guide_for_Submitting_Jobs)
- [https://http.ipb.ac.rs/documents/glite\\_mpi\\_user\\_guide/](https://http.ipb.ac.rs/documents/glite_mpi_user_guide/)
- [http://wiki.egee-see.org/index.php/SEE-GRID\\_Wiki](http://wiki.egee-see.org/index.php/SEE-GRID_Wiki)