



Enabling Grids for E-science

Training event: Úvod do gridového počítania
(Introduction to Grid computing)
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Spúšťanie úloh v Gride (Job submission in LCG2/GT2)

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Information Society



- **Certifikáty**
- **Grid middleware**
- **Spustenie úlohy v Gride**
- **Prenos súborov: GridFTP**
- **Ukážka aplikácie (DaveF)**
- **Ďalšie špecifikácie v JDL**
- **Spustenie bez JDL (obídenie RB)**
- **MyProxy: práca cez portál**
- **Ďalšie užitočné príkazy**
- **Typy úloh**



- Každý používateľ musí mať platný X.509 certifikát vydaný uznanou **Certification Authority (CA)**
- Pred vykonaním akejkoľvek činnosti v Gride sa používateľ musí prihlásiť na **User Interface (UI)** počítači a vytvorí si tzv. proxy certifikát
- **Proxy certifikát** má limitovanú časovú platnosť a používa sa na autentifikáciu používateľa (**delegated user credential**) bez nutnosti znova zadávať heslo (**pass phrase**) zakryptovaného privátneho kľúča

grid-proxy-init príkaz

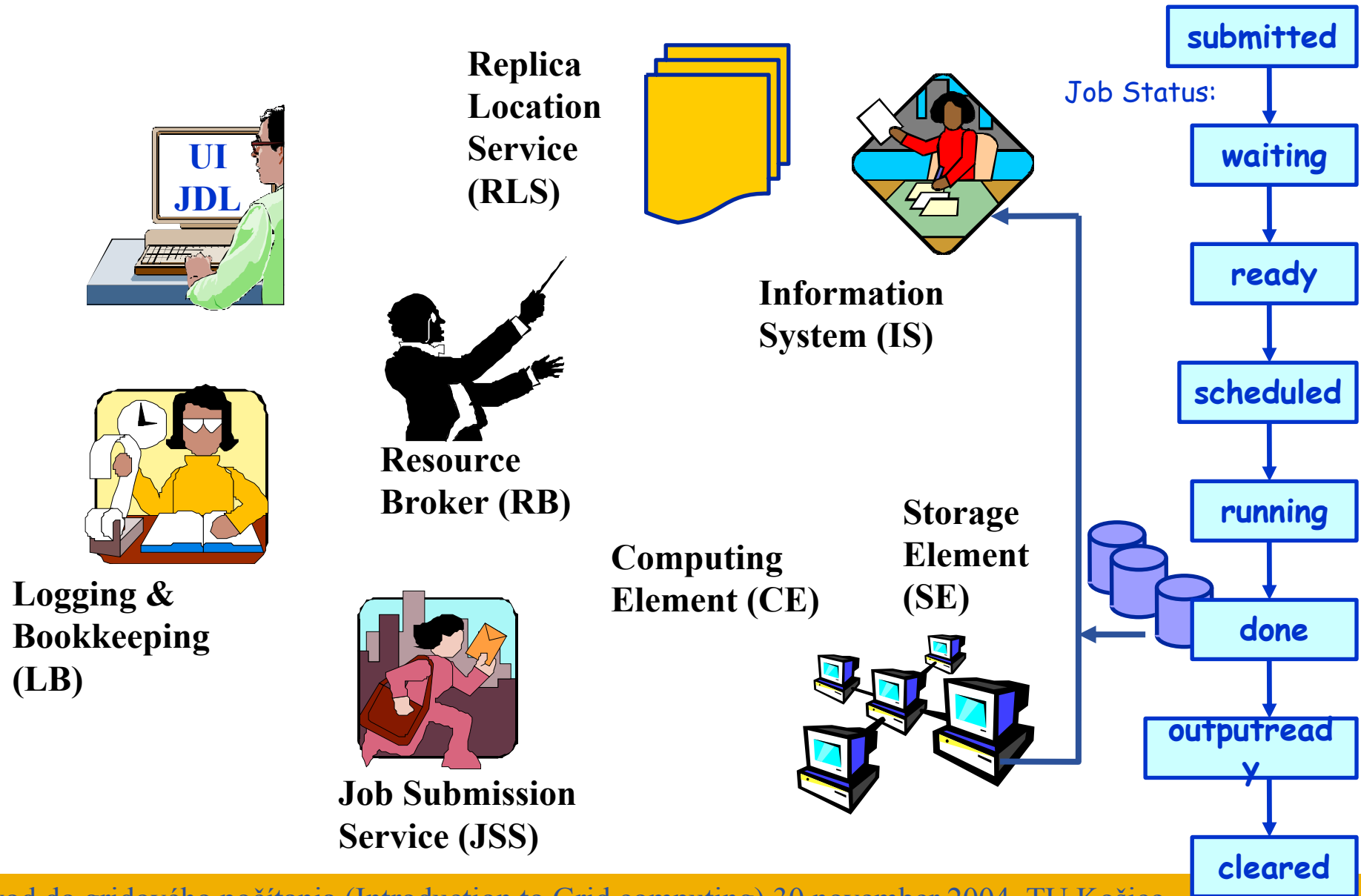
```
[miro@cluster2 miro]$ grid-proxy-init  
Your identity: /C=SK/O=SlovakGrid/O=IISAS/CN=Miroslav Dobrucky  
Enter GRID pass phrase for this identity:  
Creating proxy ..... Done  
Your proxy is valid until: Fri Nov 12 12:37:05 2004
```

grid-proxy-info

grid-proxy-destroy

Činnosť:

- **Nájsť vhodné miesto pre úlohu v Gride**
 - Pritom optimalizovať použitie zdrojov
 - Vykonať úlohu čo najrýchlejšie
- **Evidovať naplánované, bežiacie a skončené úlohy**
- **Evidovať repliky údajových súborov**
- ...



- **Používateľ musí vytvoriť popisný súbor úlohy v Job Description Language (JDL)**
 - aký program (do neznámeho prostredia!)
 - aké údajové súbory (repliky?)
 - aké požiadavky na OS, knižnice, ...
- **Potom pošle úlohu do Resource Broker (RB)**

```
[miro@cluster2 miro]$ cat hostname.jdl  
Executable = "/bin/hostname";  
StdOutput = "std.out";  
StdError = "std.err";  
OutputSandbox = {"std.out", "std.err"};
```


edg-job-submit príkaz

```
[miro@cluster2 miro]$ edg-job-submit hostname.jdl
```

```
Selected Virtual Organisation name (from UI conf file): cg
```

```
Connecting to host rb01.lip.pt, port 7772
```

```
Logging to host rb01.lip.pt, port 9002
```

```
*****
```

```
JOB SUBMIT OUTCOME
```

```
The job has been successfully submitted to the Network Server.
```

```
Use edg-job-status command to check job current status. Your job  
identifier (edg_jobId) is:
```

```
- https://rb01.lip.pt:9000/vrTuD4Tm-rQZvtdMma0a7w
```

```
*****
```


edg-job-status príkaz

```
[miro@cluster2 miro]$ edg-job-status https://rb01.lip.pt:9000/vrTuD4Tm-
rQZvtdMma0a7w
```

```
*****
```

```
BOOKKEEPING INFORMATION:
```

```
Status info for the Job : https://rb01.lip.pt:9000/vrTuD4Tm-rQZvtdMma0a7w
Current Status:      Done (Success)
Exit code:           0
Status Reason:       Job terminated successfully
Destination:         ce.grid.cesga.es:2119/jobmanager-pbs-infinite
reached on:          Fri Nov 12 12:48:53 2004
```



```
*****
```

edg-job-get-output príkaz

```
[miro@cluster2 miro]$ edg-job-get-output https://rb01.lip.pt:9000/vrTuD4Tm-
rQZvtdMma0a7w
```

```
Retrieving files from host: rb01.lip.pt ( for
https://rb01.lip.pt:9000/vrTuD4Tm-rQZvtdMma0a7w )
```

```
*****
```

```
JOB GET OUTPUT OUTCOME
```

```
Output sandbox files for the job:
```

```
- https://rb01.lip.pt:9000/vrTuD4Tm-rQZvtdMma0a7w
```

```
have been successfully retrieved and stored in the directory:
```

```
/tmp/miro_vrTuD4Tm-rQZvtdMma0a7w
```

```
*****
```

```
[miro@cluster2 miro]$ ls -lA /tmp/miro_vrTuD4Tm-rQZvtdMma0a7w
```

```
total 4
```

```
-rw-rw-r-- 1 miro miro 0 Nov 12 13:53 std.err
```

```
-rw-rw-r-- 1 miro miro 21 Nov 12 13:53 std.out
```

```
[miro@cluster2 miro]$ cat /tmp/miro_vrTuD4Tm-rQZvtdMma0a7w/std.out
```

```
grid01.grid.cesga.es
```

globus-url-copy príkaz

```
[miro@cluster2 miro]$ globus-url-copy \  
  gsiftp://storage.ui.sav.sk/home/miro/grid-data/Malpasset.2dm \  
  file://$PWD/Malpasset.2dm
```

Ďalšie užitočné príkazy:

- edg-gridftp-ls
- edg-gridftp-exist
- edg-gridftp-mkdir
- edg-gridftp-rmdir
- edg-gridftp-rm
- edg-gridftp-rename

```
[miro@cluster2 testgrid]$ cat davef.jdl
Executable      = "davef.sh";
StdOutput       = "davef.out";
StdError        = "davef.err";
InputSandbox    = {"davef.sh"};
OutputSandbox   = {"davef.out", "davef.err"};
```

```
[miro@cluster2 testgrid]$ cat davef.sh
```

```
globus-url-copy gsiftp://storage.ui.sav.sk/~/grid-data/davef \
  file://$PWD/davef
chmod a+x davef
```

```
globus-url-copy gsiftp://storage.ui.sav.sk/home/miro/grid-data/Malpasset.prj
  file://$PWD/Malpasset.prj
```

```
./davef Malpasset.prj
```

```
globus-url-copy file://$PWD/Malpasset.flo \
  gsiftp://storage.ui.sav.sk/home/miro/grid-data/Malpasset.flo
```

Potenciálna chyba



Edg-job-list-match príkaz

```
[miro@cluster2 testgrid]$ edg-job-list-match davef.jdl
```

```
Selected Virtual Organisation name (from UI conf file): cg
Connecting to host rb01.lip.pt, port 7772
```

```
*****
```

```
COMPUTING ELEMENT IDs LIST
```

```
The following CE(s) matching your job requirements have been found:
```

```
*CEId*
```

```
ce.grid.cesga.es:2119/jobmanager-pbs-infinite
ce.grid.cesga.es:2119/jobmanager-pbs-long
ce.grid.cesga.es:2119/jobmanager-pbs-short
ce001.grid.ucy.ac.cy:2119/jobmanager-pbs-infinite
ce001.grid.ucy.ac.cy:2119/jobmanager-pbs-long
ce001.grid.ucy.ac.cy:2119/jobmanager-pbs-short
cluster.ui.sav.sk:2119/jobmanager-pbs-workq
cms.fuw.edu.pl:2119/jobmanager-pbs-infinite
cms.fuw.edu.pl:2119/jobmanager-pbs-long
cms.fuw.edu.pl:2119/jobmanager-pbs-short
grid01.physics.auth.gr:2119/jobmanager-pbs-infinite
```

```
[miro@cluster2 testgrid]$ cat davef-client-cluster.jdl
```

```
Executable      = "davef_loader_script.sh";
Arguments       = "davef_param_sk.cfg";
StdOutput       = "davef.out";
StdError        = "davef.err";
InputSandbox    = {"davef_loader_script.sh", "davef_param_sk.cfg"};
OutputSandbox  = {"davef.out", "davef.err"};
JobType         = "MPICH";
NodeNumber      = 16;
Requirements    = other.GlueCEUniqueID ==
  "cluster.ui.sav.sk:2119/jobmanager-pbs-workq"
```

- Premenné prostredia
- Vstupné dáta (PFN a/alebo LFN)
 - Protokol prístupu k nim
- Výstupné dáta (na ktorý SE, registrovať)
- Rank (preferencia: freeCPU, response time, random)
- Requirements (maxCPUtime, maxWallClock, *doména, testbed, estimated response time, freeCPU>x, totalCPU>x, ...)
- ...

globus-job-run príkaz

```
[miro@cluster2 testgrid]$ globus-job-run cluster.ui.sav.sk /bin/ls
8queen_speedup
Desktop
bin
davef_param.cfg
davef_vis.cfg
encrypt.pl
flo2dh_310_src.zip
gr
gram_job_mgr_11873.log
gram_job_mgr_11904.log
```

- **Myproxy server je vhodný pre:**
 - Veľmi dlhé úlohy (bežný proxy expiruje)
 - Proxy certifikát je automaticky obnovovaný počas celého behu úlohy
 - Prenos proxy certifikátu na iný počítač než UI (typické pre portály)

myproxy-init príkaz

```
[miro@cluster2 testgrid]$ myproxy-init -s kentauros.rtd.algo.com.gr
Your identity: /C=SK/O=SlovakGrid/O=IISAS/CN=Miroslav Dobrucky
Enter GRID pass phrase for this identity:
Creating proxy ..... Done
Proxy Verify OK
Your proxy is valid until: Fri Nov 12 15:25:40 2004
Enter MyProxy pass phrase:
Verifying password - Enter MyProxy pass phrase:
A proxy valid for 168 hours
```

myproxy-get-delegation príkaz

```
[miro@cluster miro]$ myproxy-get-delegation -s  
kentauros.rtd.algo.com.gr
```

```
Enter MyProxy pass phrase:
```

```
A proxy has been received for user miro in /tmp/x509up_u1001
```

- **grid-proxy-info**
- **grid-proxy-destroy**
- **edg-job-cancel**
- **edg-job-get-logging-info**
- **myproxy-info**
- **myproxy-destroy**
- **globus-job-submit**
- **globus-job-status**
- **globus-job-cancel**
- **globus-job-get-output**

- **Jednoduchá (sekvenčná)**
- **MPICH (P4, G2)**
- **Interaktívna**
 - StdOut StdErr priebežne doručované
 - X-windows
 - Iné (MD, VNC)
- **Checkpointable (zatiaľ nie)**

- **grid-proxy-init**
- **edg-job-submit job.jdl**
- **edg-job-status**
- **edg-job-get-output**

```
Executable = "davef.sh";  
StdOutput  = "davef.out";  
StdError   = "davef.err";  
InputSandbox = {"davef.sh"};  
OutputSandbox =  
{"davef.out","davef.err"};
```

Ďakujem za pozornosť

<http://public.eu-egee.org>

<http://ups.savba.sk/parcom/egee/index.html>

<http://ups.savba.sk/ca/>