

Gridifying the LHCb Monte Carlo production system

Eric van Herwijnen, Joel Closier

Friday, 1 march 2002

Demo for DataGrid Review





Contents



-
- ◆ **LHCb**
 - ◆ **LHCb distributed computing environment**
 - ◆ **Integration of DataGrid middleware**
 1. Authentication
 2. Job submission to DataGrid
 3. Monitoring and control
 4. Data replication
 5. Resource scheduling – use of CERN MSS



LHCb



-
- ◆ **LHC collider experiment**
 - ◆ **10^9 events * 1Mb = 1 Pb**
 - ◆ **Need a distributed model**
 - ◆ **Create, distribute and keep track of data automatically**



1. Authentication



-
- ◆ **grid-proxy-init**



2. Job submission



- ◆ **dg-job-submit /home/evh/sicb/sicb/bbincl1600061.jdl -o /home/evh/logsub**

bbincl1600061.jdl:

#

```
Executable = "script_prod";
```

```
Arguments = "1600061,v235r4dst,v233r2";
```

```
StdOutput = "file1600061.output";
```

```
StdError = "file1600061.err";
```

```
InputSandbox =
```

```
  {"/home/evhtbed/scripts/x509up_u149", "/home/evhtbed/sicb/mcsend",  
   "/home/evhtbed/sicb/fsizer", "/home/evhtbed/sicb/cdispose.class", "/home/  
evhtbed/v235r4dst.tar.gz", "/home/evhtbed/sicb/sicb/bbincl1600061.sh",  
   "/home/evhtbed/script_prod", "/home/evhtbed/sicb/sicb1600061.dat",  
   "/home/evhtbed/sicb/sicb1600062.dat", "/home/evhtbed/sicb/sicb1600063.dat",  
   "/home/evhtbed/v233r2.tar.gz"};
```

```
OutputSandbox =
```

```
  {"job1600061.txt", "D1600063", "file1600061.output", "file1600061.err",  
   "job1600062.txt", "job1600063.txt"};
```

3. Monitoring and control

The screenshot displays a monitoring interface for LHCb THCP. It consists of several panels:

- Top Left:** A window titled "Vision_1: Main" with a menu bar (File, Panel, ?) and a toolbar. Below the toolbar is the LHCb THCP logo.
- Bottom Left:** A table titled "View Jobs on ALL Centers" showing a list of jobs from the Bologna center.
- Center:** A panel for job details, including fields for "Executable:", "Version:", "DBase:", "Event Type:", "Nr. Events:", "QQ Decay File:", and "QQ User File:". A "View" button is visible below these fields.
- Right:** A "File" window showing the contents of the script "/afs/cern.ch/lhcb/project/web/wdqa/vol10/sicb/sicb/mc274185.sh".
- Bottom:** A status panel showing "MC Production Processes: OK" and a "Close" button.

The script content in the "File" window is as follows:

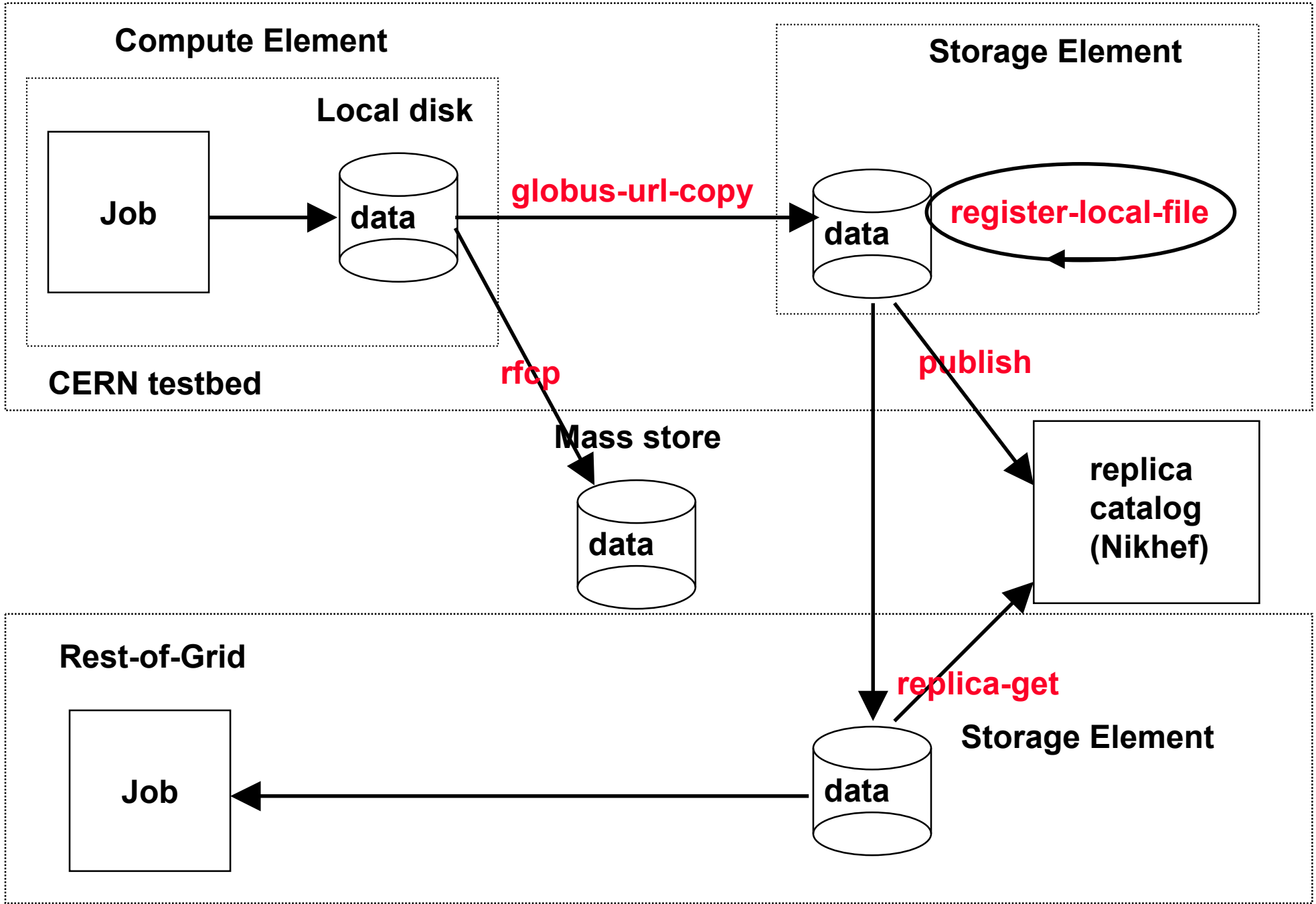
```
#!/usr/bin/csh
#
cd $WORKDIR
setenv DIM_DNS_NODE alpc18.cern.ch
setenv SUBMIT_DATE 19-Feb-02
setenv SUBMIT_TIME 15:14:21
setenv mcPWD /afs/cern.ch/lhcb/project/web/wdqa/vol10/sicb/sicb/mc274185.sh
echo Define the home directory and some other variables
echo
setenv LHCBDHOME sicb/sicb/Debug
setenv LHCBVERS v249
setenv LHCBDDBASE sicb/v243r1/dbase
setenv JOBID $LSB_REMOTEJID
echo $JOBID
setenv LHCBR00T sicb
# place of sicbmc cards file
setenv SICBCARDS /afs/cern.ch/lhcb/project/web/wdqa/vol10/sicb/sicb274185.dat
setenv QQ_DECAY_FILE sicb/v243r1/dbase/decay.dec
setenv QQ_USER_FILE sicb/v243r1/dbase/B2PiPi.dec
setenv mcjobdir /afs/cern.ch/lhcb/project/web/wdqa/vol10/sicb/sicb/Lsfjob
setenv mcseaddir /afs/cern.ch/lhcb/project/web/wdqa/vol10/sicb/sicb/Lsfjob
setenv mcrunfile mc274185.sh
setenv mcstat 500
setenv mcjseq 274185
```



3. Monitoring and control



-
- ◆ **dg-job-status**
 - ◆ **dg-job-cancel**
 - ◆ **dg-job-get-output**





4. Publish data on storage element



◆ Copy data file to storage element:

```
globus-url-copy file:///${chemin}/L69999  
gsiftp://lxshare0219.cern.ch/flatfiles/SE1/lhcb/L69999
```

◆ Register stored data in the catalog:

```
/opt/globus/bin/globus-job-run lxshare0219.cern.ch /bin/bash -c "export  
GDMP_CONFIG_FILE=/opt/edg/lhcb/etc/gdmp.conf;/opt/edg/bin/gdmp_register_local_file  
-d /flatfiles/SE1/lhcb"
```

◆ Publish catalog:

```
/opt/globus/bin/globus-job-run lxshare0219.cern.ch /bin/bash -c "export  
GDMP_CONFIG_FILE=/opt/edg/lhcb/etc/gdmp.conf;  
/opt/edg/bin/gdmp_publish_catalogue -n"
```



5. Resource scheduling – use of CERN MSS



◆ Copy output to MSS:

1. `rfcp L1600061 /castor/cern.ch/lhcb/mc/L1600061`

◆ JDL to specify use of CERN MSS:

```
#
Executable = "script_prod";
Arguments = "1600061,v235r4dst,v233r2";
StdOutput = "file1600061.output";
StdError = "file1600061.err";
OutputSE = "lxshare0219.cern.ch";
InputSandbox =
  {"/home/evhtbed/scripts/x509up_u149", "/home/evhtbed/sicb/mcsend",
   "/home/evhtbed/sicb/fsize", "/home/evhtbed/sicb/cdispose.class", "/
home/evhtbed/v235r4dst.tar.gz", "/home/evhtbed/sicb/sicb/bbincl160
0061.sh", "/home/evhtbed/script_prod", "/home/evhtbed/sicb/sicb1600
061.dat", "/home/evhtbed/sicb/sicb1600062.dat", "/home/evhtbed/sicb
/sicb1600063.dat", "/home/evhtbed/v233r2.tar.gz"};
OutputSandbox =
  {"job1600061.txt", "D1600063", "file1600061.output", "file1600061.er
r", "job1600062.txt", "job1600063.txt"};
```