



NGS Resource Broker

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Talk Outline

- Introduction & Background
- What is a Resource Broker (RB)?
- gLite WMS-LB
- Future work

Introduction

Grid Deployment Group, RAL

- NGS Helpdesk
- Services : CA, MyProxy, GSI-SSHTerm
 - NGS: BDII, RB, Monitoring etc.
 - EGEE: GOCDB, UKI ROC etc.

<http://www.ngs.ac.uk>

support@grid-support.ac.uk



RB Background

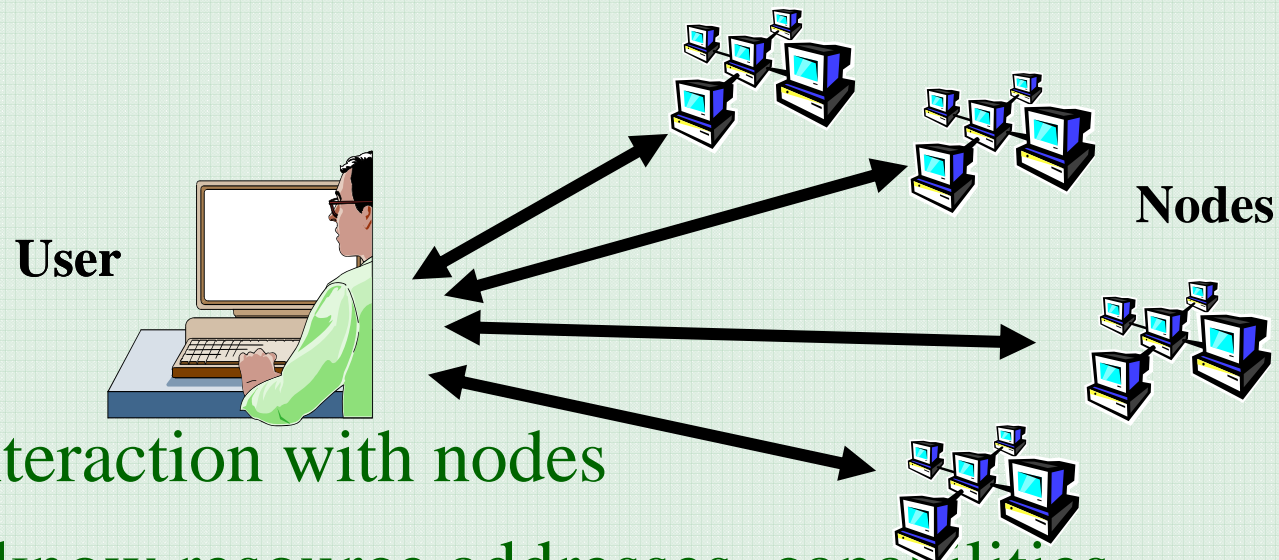
- NGS started in 2004
- GT2.4 based middleware
- Meanwhile EGEE deployed new Resource Broker – “Workload Management System”
- RB always high on NGS wish-list
- gLite RB+UI: pre-production from 2007/03
- Core sites RB-compliant
- RB: now available for users



RB – What is it (and isn't)...

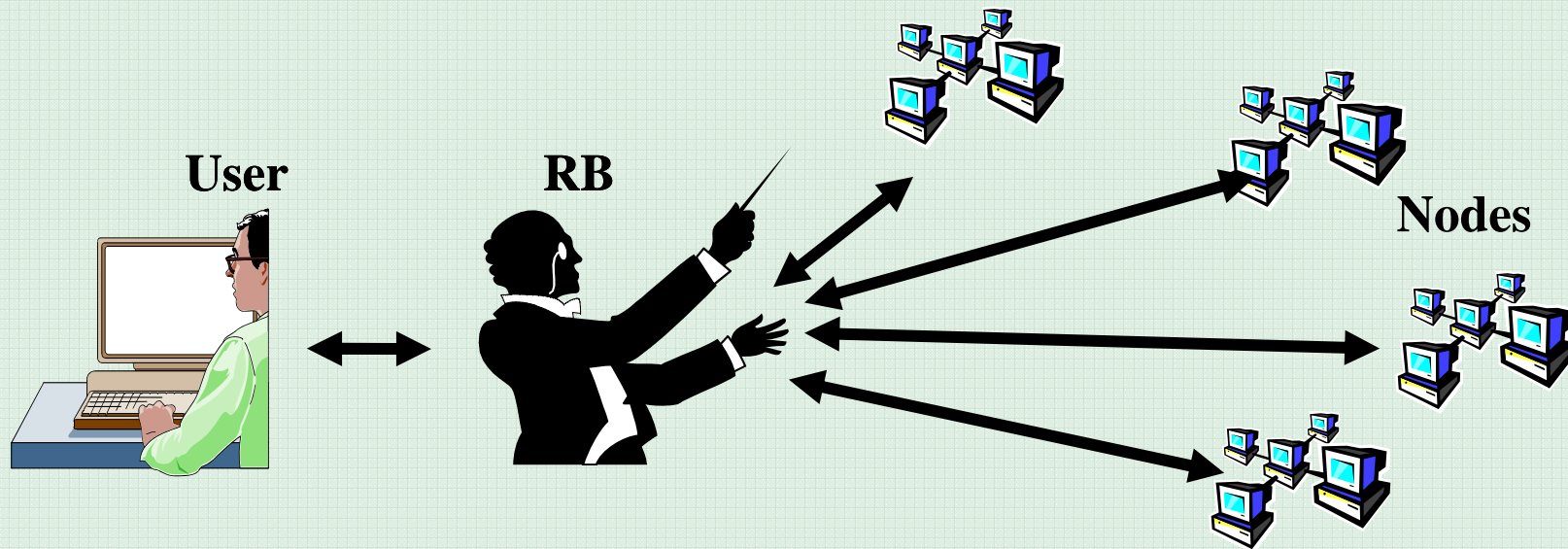
- [...] component to allow users to submit **jobs** and performs all tasks required to submit them, without exposing the user to the complexities of the Grid¹
- An interface to Grid resources
- It can:
 - *choose the best resource to run your job*
- It enables:
 - *resources to scale transparently*
 - *load balancing*
- It is **not** anything to do with the Storage Resource Broker (SRB)!

Before...



- Direct interaction with nodes
- Need to know resource addresses, capabilities

With a Resource Broker...



- User doesn't care where jobs are run
- Faster results
- Easier, more scalable

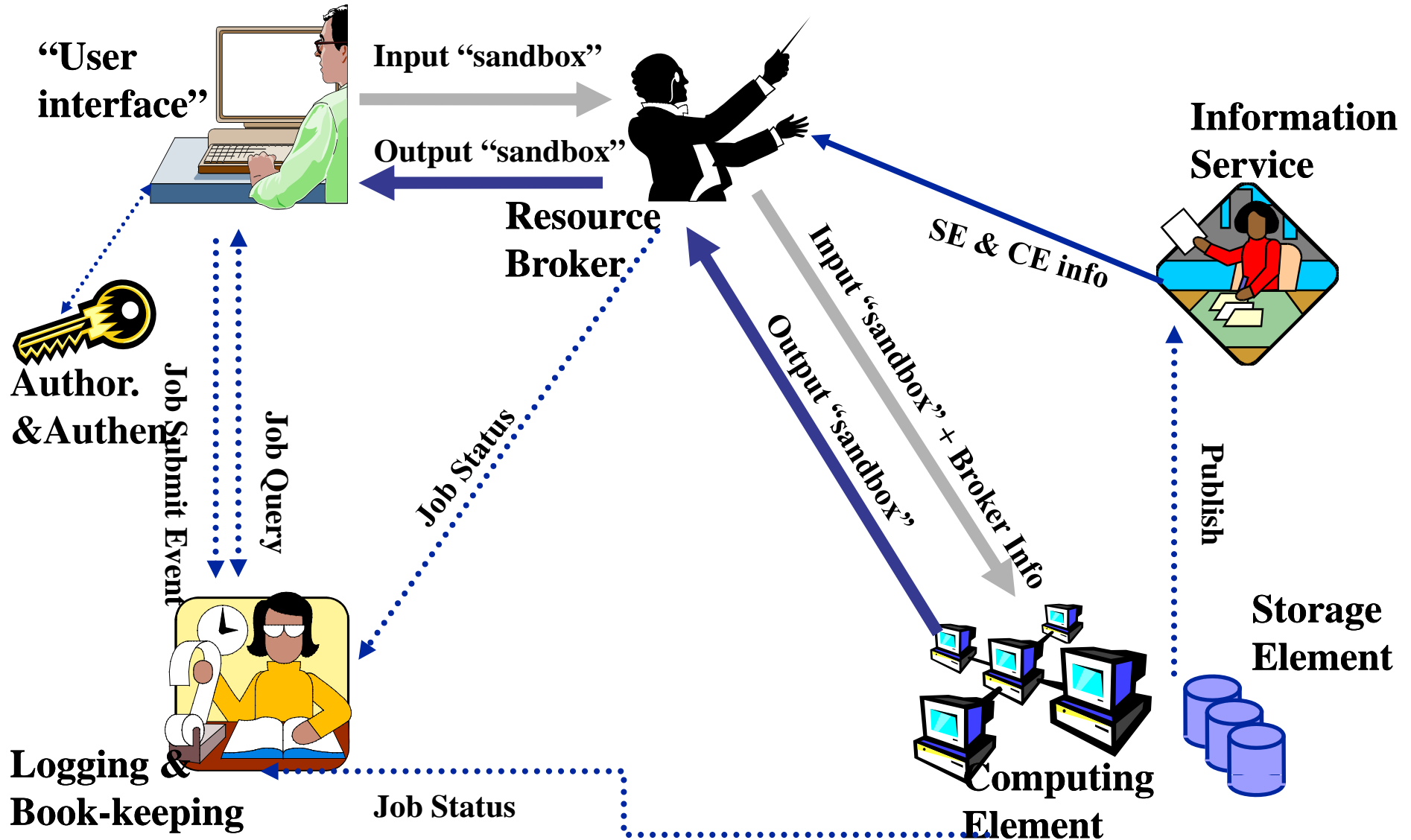


NGS

National Grid Service

NGS Resource Broker

- Based on gLite WMS-LB from EGEE
- Can send jobs to other grids
- Can be used from:
 - web portals (P-GRADE, in future NGS Portal)
 - from a User Interface (UI) by command line



Simple Workflow

1. Log onto User Interface box
2. Write job description in JDL, + required files. Specify resource requirements
3. Submit job with `glite-job-submit`
<RB chooses best resource matching description>
4. Check status with `glite-job-status`
Waiting → Ready → Scheduled → Running → Done
5. Retrieve **output** with `glite-job-output`

Sample JDL file

```
Type = "Job";
JobType = "Normal";
Executable = "/usr/ngs/GAUSSIAN_G03_C02";
StdInput = "/usr/local/applications
    chemistry/gaussian/g03_C02/g03/tests/com/test001.com";
StdOutput = "test001.out";
StdError = "test001.err";
OutputSandbox = {"test001.out", "test001.err"};
RetryCount = 4;
ShallowRetryCount = -1;
Requirements = Member("GAUSSIAN_G03_C02",
    other.GlueHostApplicationSoftwareRunTimeEnvironment) &&
    Mds-Computer-platform == "i686" ;
```



NGS RB Resource matching

- To see the resources matching your JDL:

```
$>glite-job-list-match --rank sample.jdl
```

```
*****
```

```
COMPUTING ELEMENT IDs LIST
```

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

CEId	*Rank*
grid-data.man.ac.uk:2119/jobmanager-pbs-router	0
grid-data.rl.ac.uk:2119/jobmanager-lsf-normal	-92160
grid-compute.leeds.ac.uk:2119/jobmanager-pbs-router	-428703
grid-compute.oesc.ox.ac.uk:2119/jobmanager-pbs-router	-4036455

```
*****
```

- **WMS-LB** \approx Workload Management System and Logging and Bookkeeping System
- **CE** (Computing Element) \approx Queue on NGS node
- **SE** (Storage Element) \approx No equivalent yet on NGS
- **UI** (User Interface) \approx Machine with client tools installed
- **Information Service** provides up-to-date status of resources (BDII)

Future work

- MPI jobs support
- Enable all NGS nodes to be RB-compliant
- Make NGS Portal RB aware
- Upgrade to gLite3.1? WM-Proxy?? (parameter sweeps, pilot jobs)
- Standardize job execution across NGS - role out NGS UEE (Uniform Execution Environment)
- Roll out more User Interfaces across UK?

Summary

- RB – smart & easy way of submitting jobs across resources
- User interacts with RB by Portal or UI
- RB chooses best resource for your job
- Great for running existing applications, not ideal for developing your own applications (less interaction for debugging etc.)