Summary of Meeting with Thushka Maharaj 6 Dec 2005

Present: Thushka Maharaj, Clint Sieunarine, Matthew Mascord

Note this summary presumes some familiarity with UK e-Science Certificates, Proxy Certificates, the Globus Toolkit, the National Grid Service (NGS), Storage Resource Broker (SRB) and the CCLRC MyProxy Upload Tool.

Thushka Maharaj is a DPhil student based at the Computing Laboratory, supervised by Dr Blanca Rodriguez and working on Heart Modelling using the Tulane simulation software: the Memfem bi-domain solver and the CoolGraphics visualisation software. Thushka usually performs in silico experiments directly on the Oxford NGS cluster via the command line, although she has also used the IB portal in the past to prove the concept. After executing jobs on the Oxford NGS cluster, Thushka uploads all output data to the RAL Storage Resource Broker (SRB) vault because of the storage quota on the Oxford NGS cluster.

The primary aim of the meeting was for the IBVRE requirements team to gain an insight into possible small-scale improvements to the IB portal user interface for the December portal release, as well as to inform the design of future releases. Thushka showed Matthew and Clint how a job is submitted through portal, and whilst doing this, described issues in user interface design or functionality as she went along.

Steps Performed

1. Using the Mozilla browser on Redhat Linux, Thushka browsed to the IB portal at <http://avon.dl.ac.uk:8080/IBportal/start> and logged in under the username IBuser.
2. As it was longer than a week since Thushka had last used the IB portal, Thushka had to upload her credentials to the MyProxy server at myproxy.gridsupport.ac.uk. The Java WebStart link in the ProxyManager portlet to the CCLRC MyProxy Upload Tool <http://tiber.dl.ac.uk:8080/myproxy/myproxy.jnlp> was followed, but the browser did not recognise the JNLP extension – Thushka therefore had to browse for the Java WebStart executable. The location for this was eventually identified in the MyProxy Upload Tool documentation at <http://tiber.dl.ac.uk:8080/myproxy/Help_tiber.html>. Unfortunately, the tool failed to launch. The same problem occurred on the Konqueror browser.
3. As an alternative to using the CCLRC MyProxy Upload Tool, Thushka instead decided to upload her credentials to the MyProxy server using the command line on the Oxford NGS cluster. The instructions on how to do this were found by locating an earlier email from the Grid Operations Support Centre (GOSC). Thushka logged into the Oxford NGS cluster using a pre-written script – a convenience that executes both the grid-proxy-init and gsissh Globus commands.
4. When the myproxy-init --savemyproxy.grid-support.ac.uk command was executed, the error ‘ERROR: Couldn't find valid credentials to generate a proxy.’ was reported. It was thought that this was because her recently renewed UK e-

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1 The default lifetime for credentials held in a MyProxy server is a week.
Science credentials hadn’t yet been copied to the Oxford NGS cluster. Thushka therefore transferred them from her local desktop using Secure File Transfer Protocol (sftp).

5. When attempting to use the Proxy Manager Portlet to upload her credentials to the IB portal, an error message indicated that the credentials had expired. This led to the conclusion that some mix-up had occurred such that the old credentials had been uploaded to the MyProxy server instead of the new ones. To avoid any further problems, it was decided to go through the whole process of exporting the credentials from the browser, converting them and uploading to the MyProxy server again. This was achieved using the following steps:
   a. Exporting the credentials as a PKCS12 file from the Mozilla browser e.g. thushka.p12.
   b. Executing the relevant OpenSSL commands to convert the p12 file to two certificate files in PEM format (one DES-encrypted and containing the private key, the other unencrypted but omitting the private key) e.g.
      ```
      openssl pkcs12 -in thushka.p12 -clcerts -nokeys -out usercert.pem
      openssl pkcs12 -in thushka.p12 -nocerts -out userkey.pem
      ```
   c. Uploading the certificate files to the Oxford NGS cluster using Secure FTP.
   d. Modifying the permissions on the two files such that the one containing the private key was readable only by the user, whereas the other was world readable e.g.
      ```
      chmod 400 userkey.pem
      chmod 644 usercert.pem
      ```

6. Finally the `myproxy-init -s myproxy.grid-support.ac.uk` command executed successfully, and the Proxy Manager Portlet showed the lifetime of the credentials uploaded to the portal. The remainder of the exercise would utilize the Job Submission and Batch Monitor portlets.

It was noted that the Job Submission Portlet had a number of fields defaulted:

Hostname: grid-compute.oesc.ox.ac.uk
Job Manager: pbs
Executable: MemfemRun_slab
Input Data Directory: simulations/3D_slab/epi
Results Directory: results

These can be configured on a per-user basis. Unlike the NGS portal, the directories referred to in these fields are relative to the user’s account in SRB, not to their home directory on NGS.

Before the IB portal can be used to submit jobs, SRB has to be enabled on the user’s NGS account and two IB-specific items need to be present in the user’s NGS cluster home directory: the IBRun script and the IB-temp directory. The IBRun script is available from Damian Mac Randal <D.M.Mac.Randal@rl.ac.uk>.
7. Thushka pointed out that before a job can be executed it is necessary to check that the relevant executable and input files exist within SRB. At present all input files and the executable are expected to be located in the same directory - specified in ‘Input Data Directory’ field. Whilst the file transfer portlet allows for the manipulation of files stored locally on an NGS cluster, there is no capability at present to browse, upload or retrieve files within SRB. The only option on Linux is to use the SRB S-commands on the NGS command line:

```bash
module add srb
Sinit
Sls
etc
```

8. Once Thushka had confirmed the existence of the relevant input files and executable, Thushka gave the job an arbitrary name – there are no conventions for this although it usual to include, within the name, some reference to the parameter set being used.

9. When the ‘Launch’ button had been clicked on the Job Submission Portlet, the portal refreshed and the Batch Job Monitor Portlet indicated that the job was in an ‘UNSUBMITTED’ state. Further refreshes showed the job in the ‘ACTIVE’ state and finally the ‘DONE’ state.

10. Thushka used the SRB S-commands on her local desktop machine to confirm the existence of the results of this job in the results directory, within the input directory specified within the IB portal.

**Summary of Issues**

Thushka gave a number of reasons why she generally uses the command line to submit jobs rather than the IB portal:

- she is familiar with it,
- it provides similar functionality to the portal, and
- it was the way she was originally taught

Although when using the command line there is the extra step of uploading output data to SRB, Thushka felt that having this automated in the portal did not bring a significant enough benefit to convince her to use it.

The issues with the existing IB portal can be summarised as follows:

1. The process of uploading credentials to the MyProxy server can be problematic.
2. There is currently only one IB portal user account, defeating portal personalisation [note: there are plans to resolve this in the next IB portal release, by creating individual IB user accounts].
3. There is no ability to browse SRB from within the IB Portal – on Linux, the command line S-commands have to be used.

Thushka had no comments on the current layout or look and feel of the portal.