



Enabling Grids for E-science

# Network Services Development Network Resource Provision

*4<sup>th</sup> EGEE Conference, Pisa, 28<sup>th</sup> October 2005*

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Information Society



- **SA2**
  - Operational Interface EGEE ⇔ Network (Géant + NRENs)
  - SLAs EGEE ⇔ Network (Géant + NRENs)
  - Technical Network Liaison Committee
  
- **JRA4**
  - Network Performance Monitoring
  - Bandwidth Allocation and Reservation
  - IPv6

**These activities are by design building an important working relation between EGEE and the network providers (GÉANT + NRENs)**

# SA2: Network Resource Provision

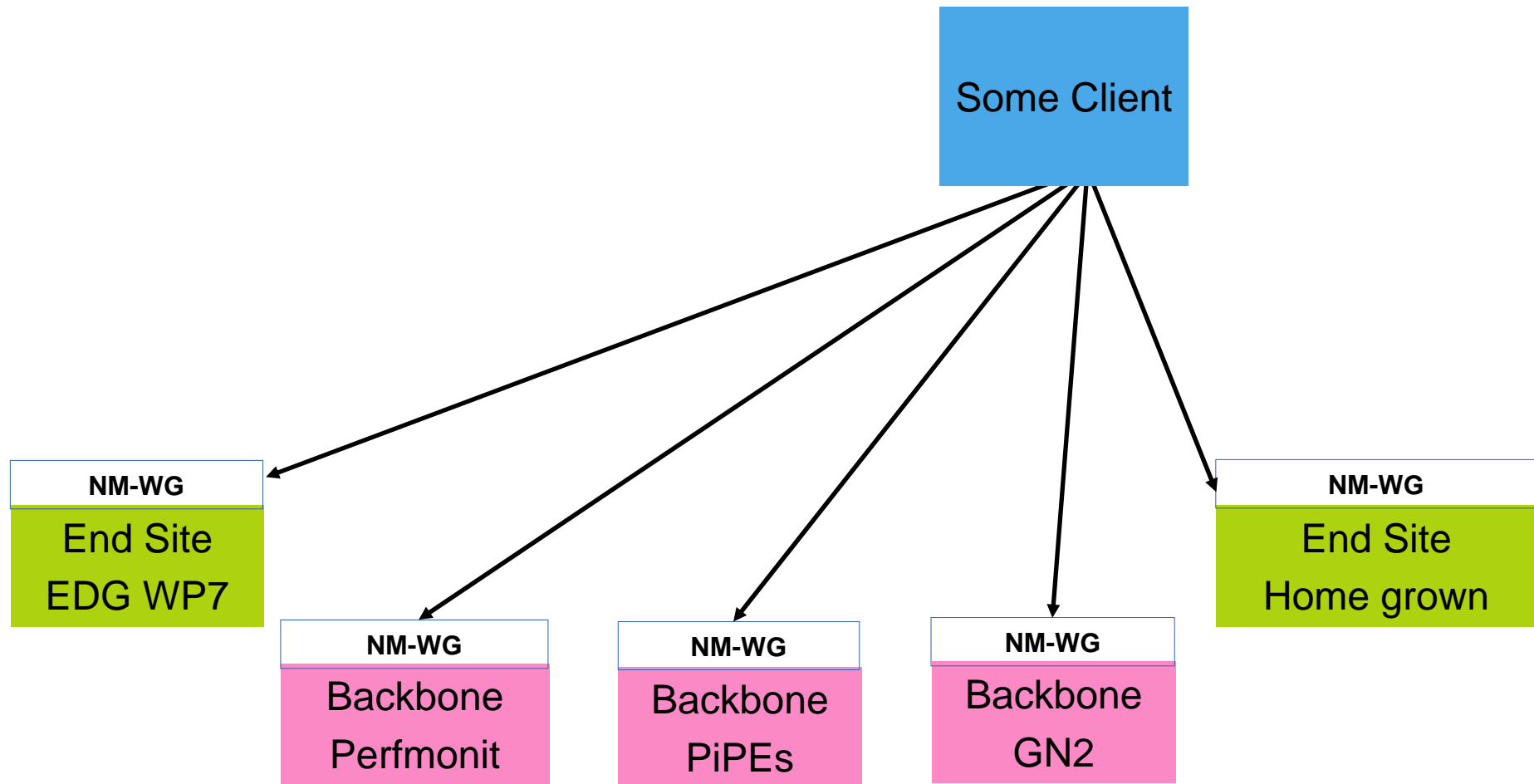
- **ENOC is “EGEE Network Operation Centre”:**
  - Support unit for all network-related issues in EGEE
  - Interface between EGEE and NREN NOCs.
- **A trial took place during the summer:**
  - Two NRENs involved: Géant and Renater (plus RBnet),
- **Aim:**
  - Work with GGUS to integrate the ENOC in their workflow
  - Test the ENOC procedures defined in MSA2.3
  - Implement software to parse and filter Trouble-Ticket (TT) emails.
- **Early stats (68 days test):**
  - About 1500 mails received (more than 600 per NREN, the rest from GGUS). This corresponds to about 450 unique TT (~200 per NREN).
- **Next steps:**
  - Extend “grid user” workflow tests to encompass the whole procedure;
  - Test if it scales to 20 (and more) NRENs (workload on the filter tool and on the ENOC people);
  - Move to be really operational.

- **End-to-end SLA processing definition is underway**
  - Based on the DSA2.2 model
  - Further refined in this week's meeting
  - Compliant with the two-stage provisioning model defined by SA2 and JRA4
  - Will be used in the GEANT2 BAR context
- **GEANT2 and EGEE-II**
  - Interoperation between Grid and Network AA infrastructures
  - DANTE expressed their concern that BAR is dropped in EGEE-II

- **Still aim to link EGEE with the NREN Consortium**
- **Improvements:**
  - Process for technical decision making;
  - Process for information dissemination.
- **Organisation:**
  - NRENs representatives
    - For the whole NREN community
  - EGEE representatives
  - Meeting frequency:
    - Face-to-face, video-conference

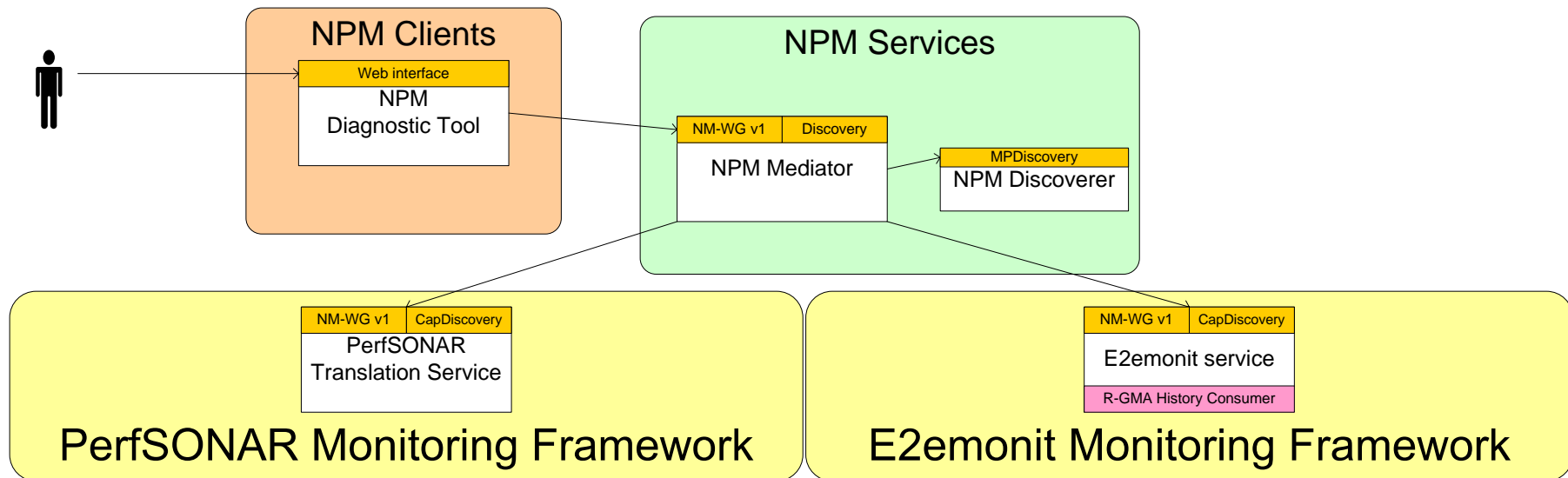
# JRA4: Network Services Development

- **Standardising access to NPM across different domains.**
  - GGF NM-WG recommendation is the selected basis for standardisation



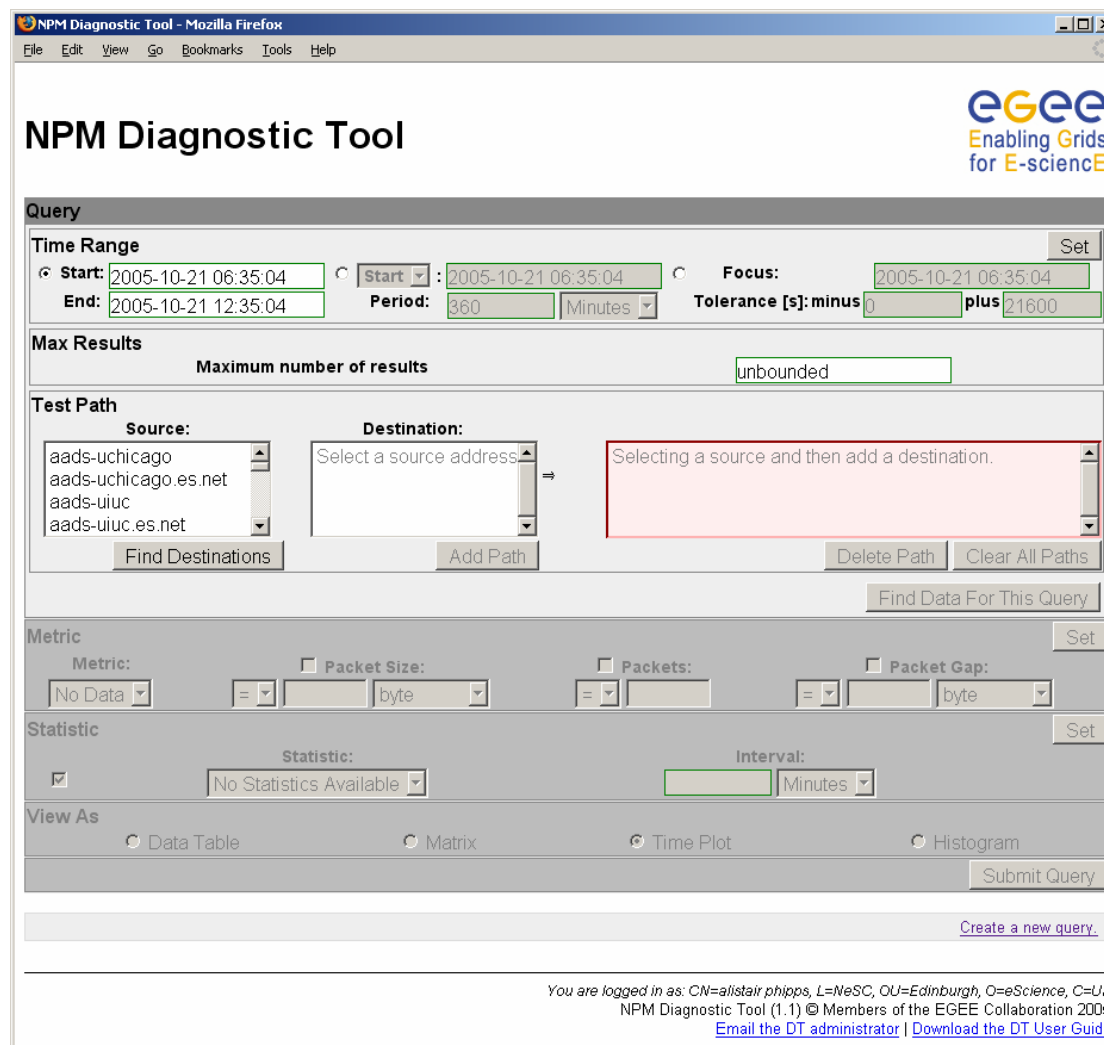


- The currently deployed NPM client, services and accessible frameworks are shown below:



- Step 1: Access the NPM Diagnostic Tool.

- The Diagnostic Tool can be accessed using a standard web browser, which users are individually authorised to use.
- In the future, we plan to use VOMS for authorisation.
- Please mail us for access!

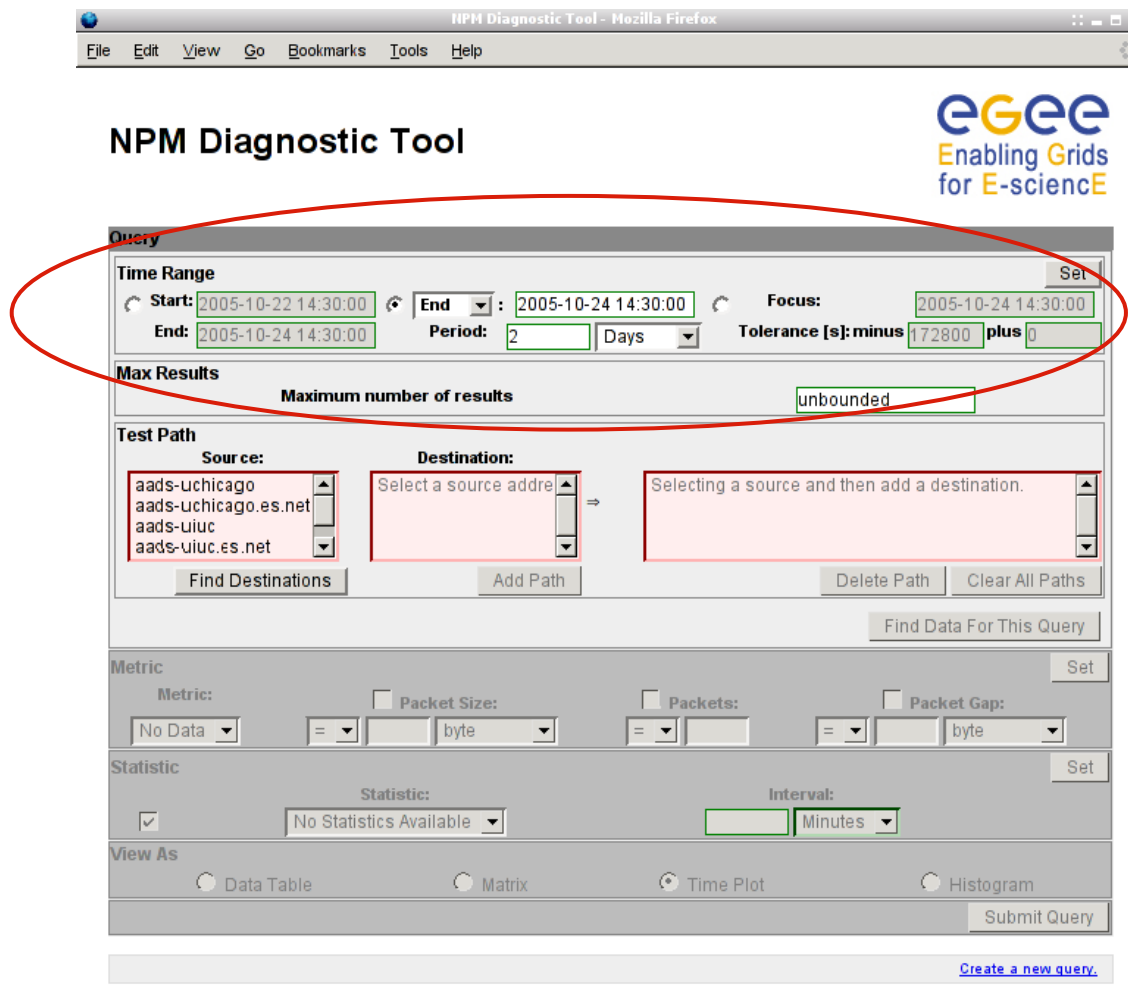


- Step 2: Select a Time.

- The end-user does not have a specific time, but knows the problem occurred within the past two days.

- The CIC-user enters the appropriate time range, specifying an End date/time of 2005-10-24 14:30:00 (the current time), and a period of 2 days.

- The CIC-user presses the Set button to confirm and the alternate time range representations update.



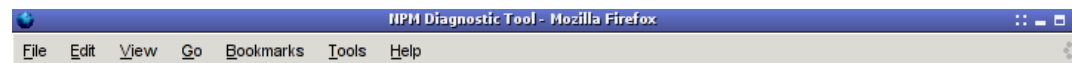
You are logged in as: CN=alstair phipps, L=NeSC, OU=Edinburgh, O=Science, C=UK  
 NPM Diagnostic Tool (1.1) © Members of the EGEE Collaboration 2005  
[Email the DT administrator](#) | [Download the DT User Guide](#)

- Step 3: Select a Path.

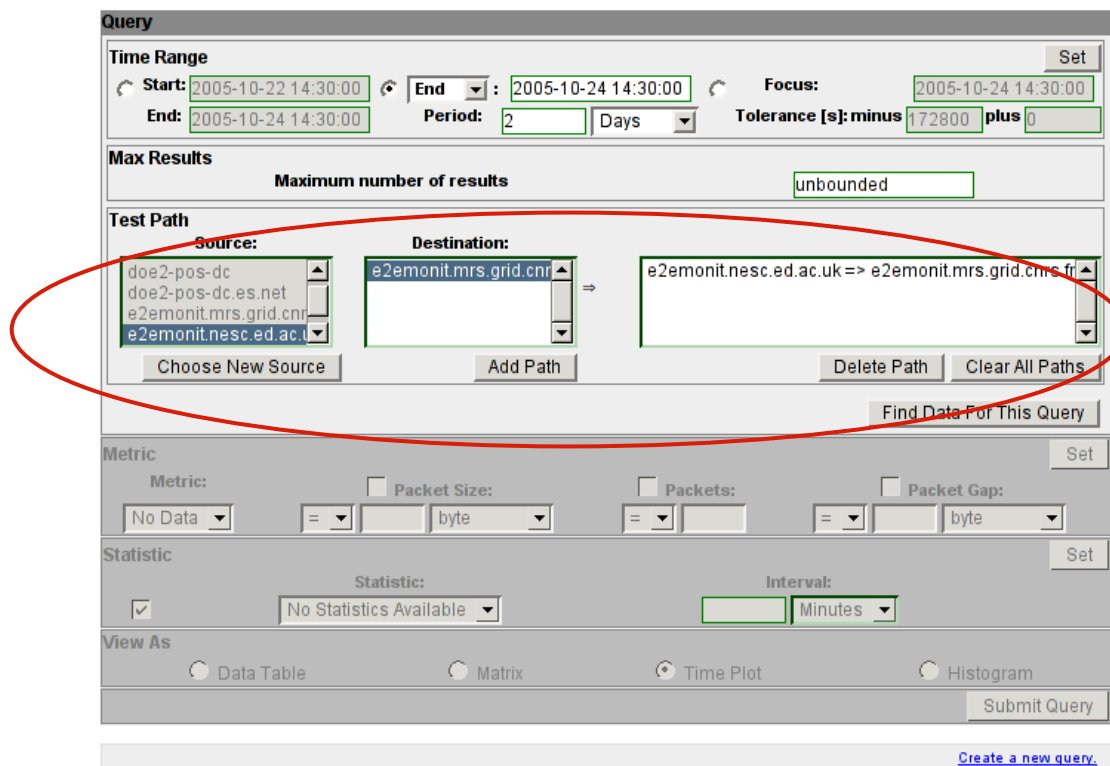
- The end-user experienced the problem between UEDIN and CNRS.

- The CIC-user selects e2emonit sites at UEDIN and CNRS, adds the path and then selects "Find Data For This Query"

- E2emonit, formerly known as EDG/WP7, is an end site-to-end site monitoring framework



## NPM Diagnostic Tool

The screenshot shows the NPM Diagnostic Tool interface. The 'Test Path' section is highlighted with a red oval. It contains a 'Source' dropdown menu with the following options: 'doe2-pos-dc', 'doe2-pos-dc.es.net', 'e2emonit.mrs.grid.cnrs', and 'e2emonit.nesc.ed.ac.uk'. The 'Destination' dropdown menu is empty. The path field contains the text 'e2emonit.nesc.ed.ac.uk => e2emonit.mrs.grid.cnrs'. Below the path field are buttons for 'Choose New Source', 'Add Path', 'Delete Path', and 'Clear All Paths'. A 'Find Data For This Query' button is also visible.

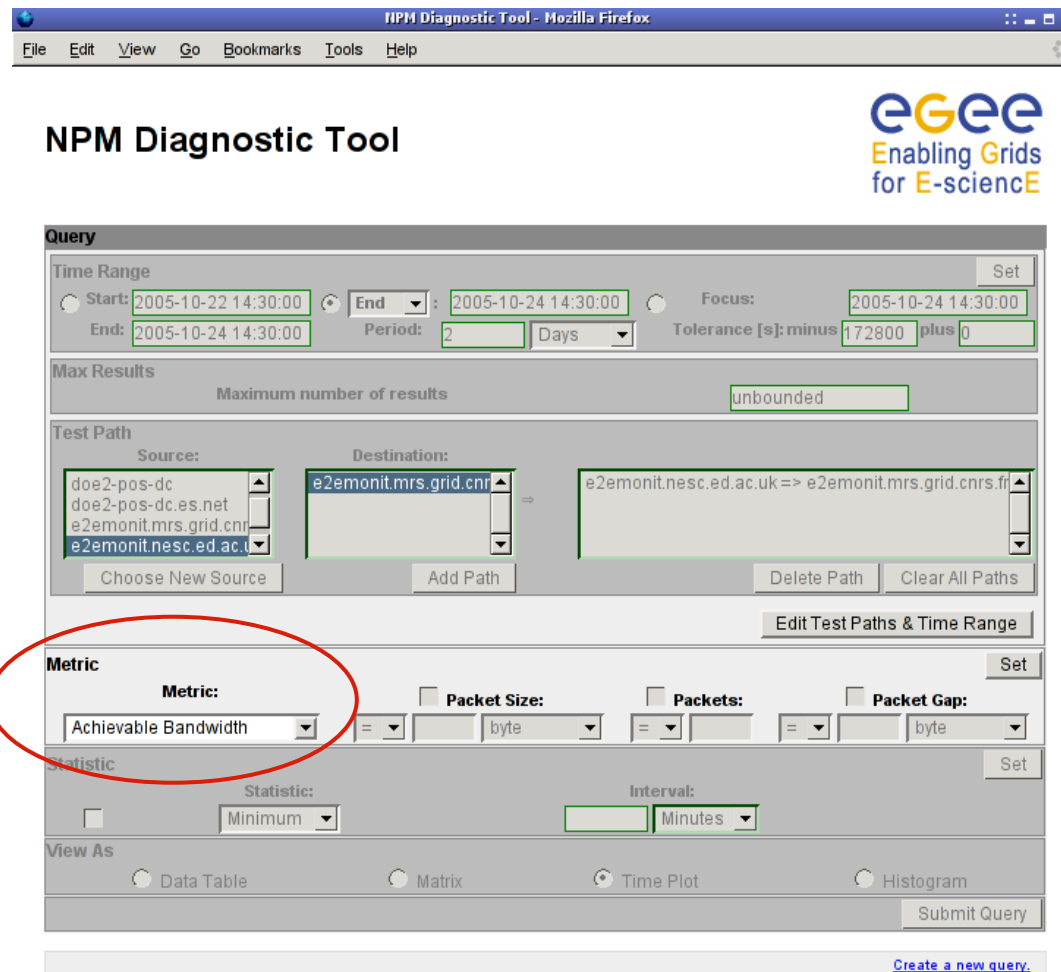
You are logged in as: CN=alstair.phipps, L=NeSC, OU=Edinburgh, O=Science, C=UK  
 NPM Diagnostic Tool (1.1) © Members of the EGEE Collaboration 2005  
[Email the DT administrator](#) | [Download the DT User Guide](#)

- Step 4: Select a Metric.

- The end-user experienced throughput problems.

- Although there are several possibly relevant metrics to choose from (and only those measured are available to select from), the CIC-user decides to look at the Achievable Bandwidth on the path.

- Achievable Bandwidth is selected from the Metrics box and the Set button pressed to confirm.

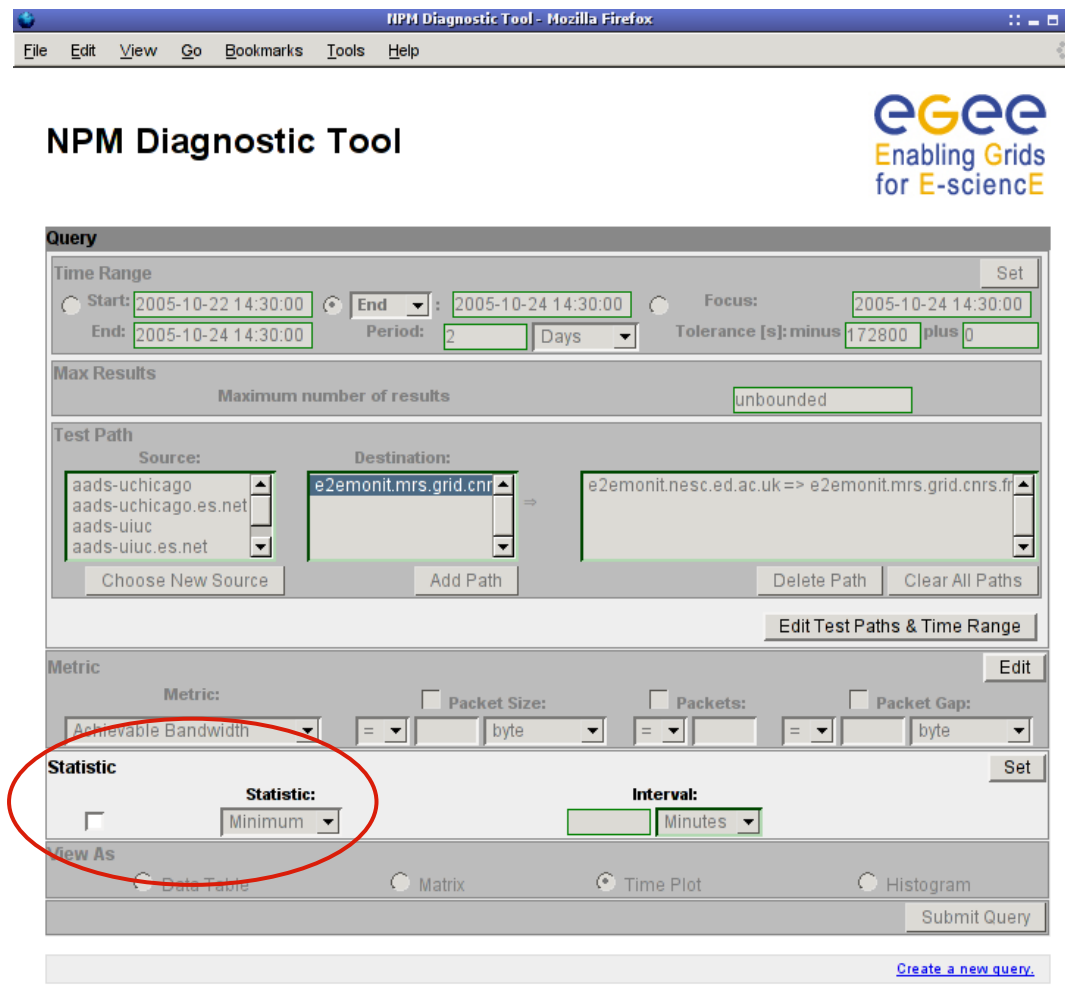


- Step 5: Select a Statistic.

- Several types of statistical data are available, such as Minimum, Maximum, Mean.

- A particular interval can be applied to each, to provide, for example, an hourly mean over the past two days.

- The CIC-user just wants a general overview of measurements and elects to retrieve raw data (Statistic check-box not checked).

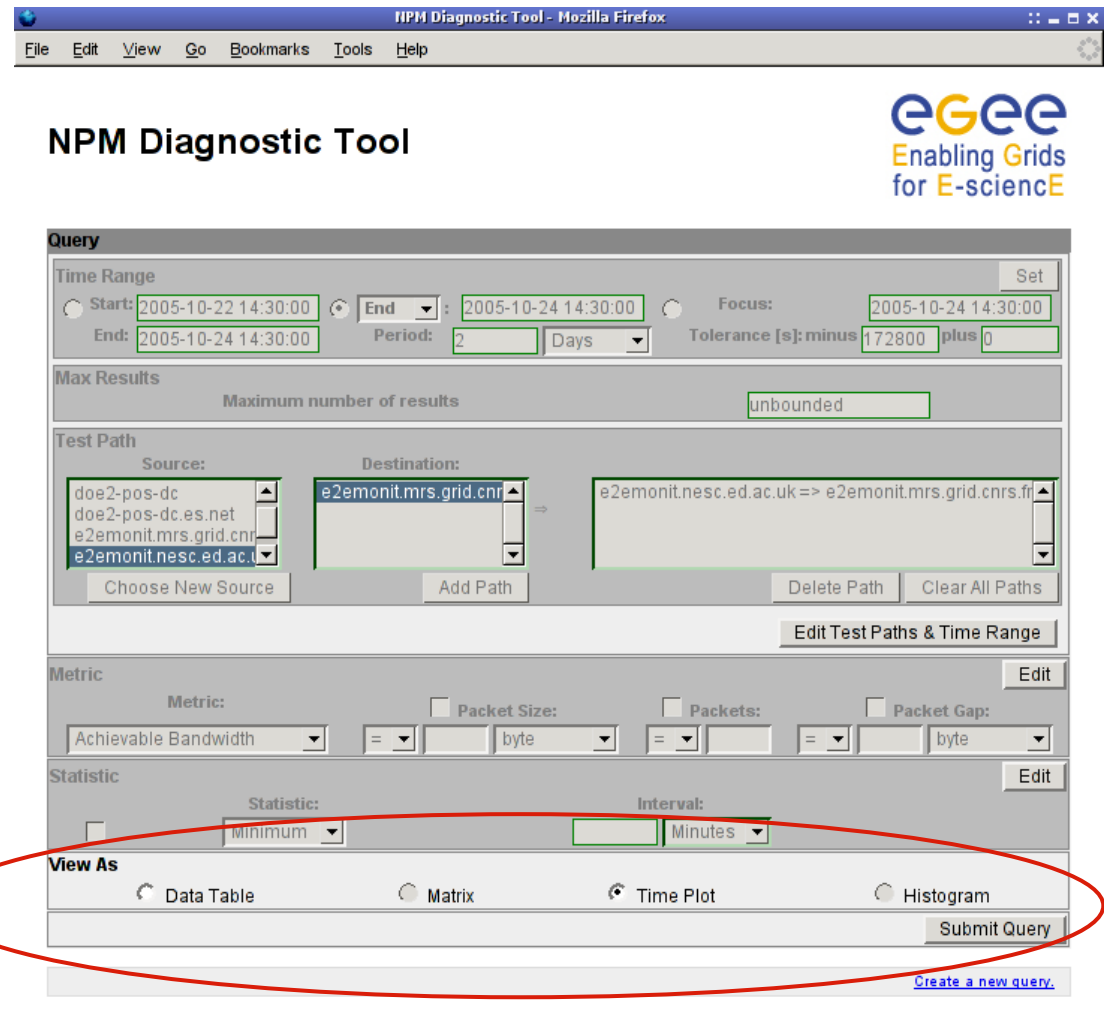


- Step 6: Select a View.

- Currently Data Table and Time Plot views are available.

- The CIC-user wants an overview of how the Achievable Bandwidth has changed over time, so selects the Time Plot.

- The Query entry is complete, and the CIC-user selects Submit Query.

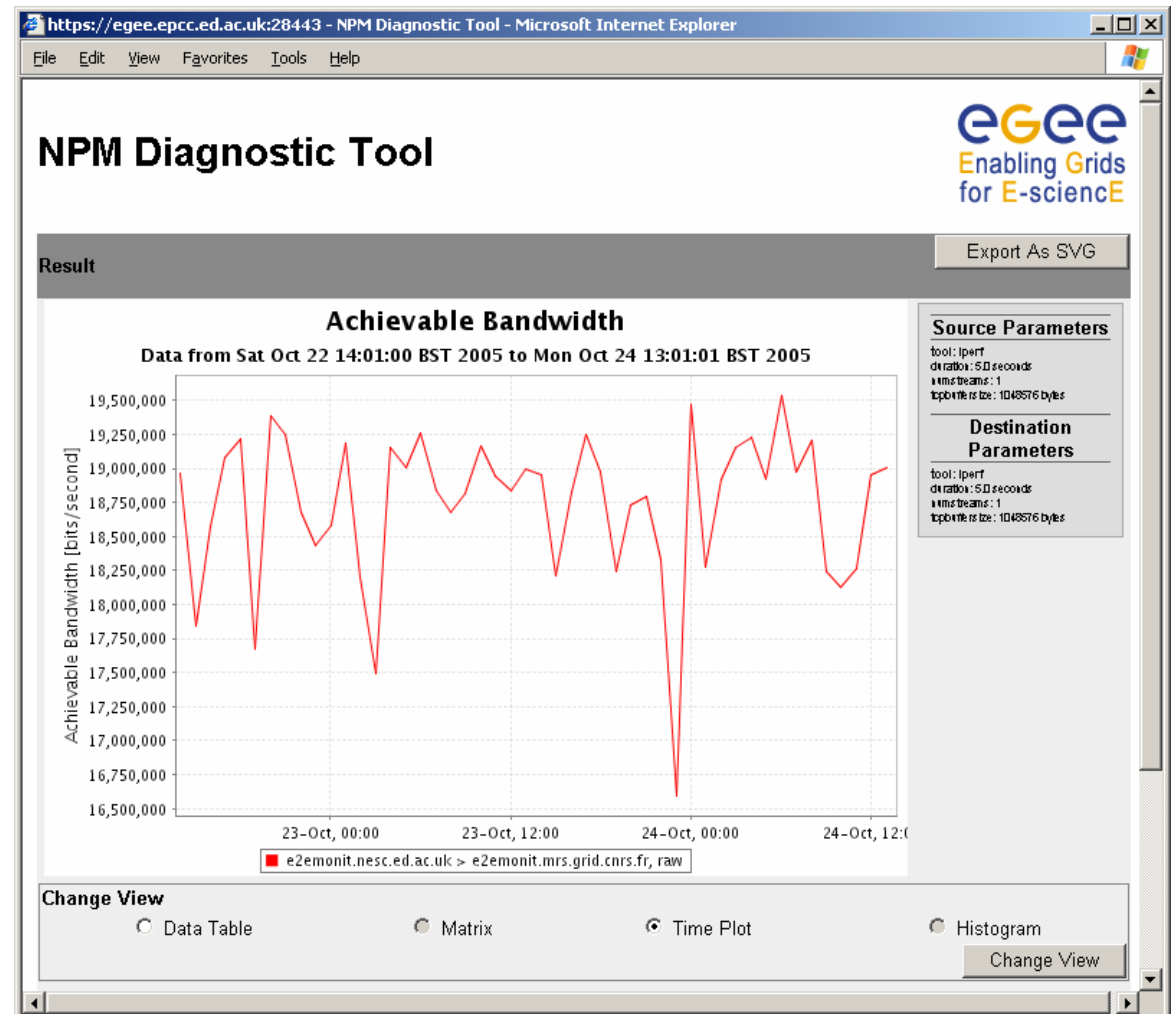


- Step 7: Examine results.

- The results are plotted, with Time on the x-axis and Achievable Bandwidth on the y-axis.

- The parameters used to gather measurements are shown - here, showing that the iperf tool was used to gather the achievable bandwidth information.

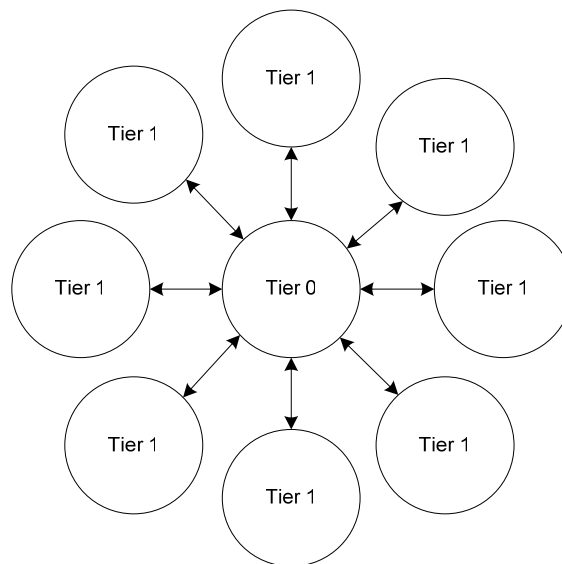
- These parameters can be useful in interpreting the results.





- JRA4 is currently working on a solution for resource-brokering middleware.
- Grid middleware has more stringent latency requirements than can be met with the Mediator:
  - The proposed *NPM Publisher*:
    - pre-caches measurement data and allows requests to be answered almost instantly
    - provides a mapping from Compute Element/Storage Element address to Network Monitoring Point address.

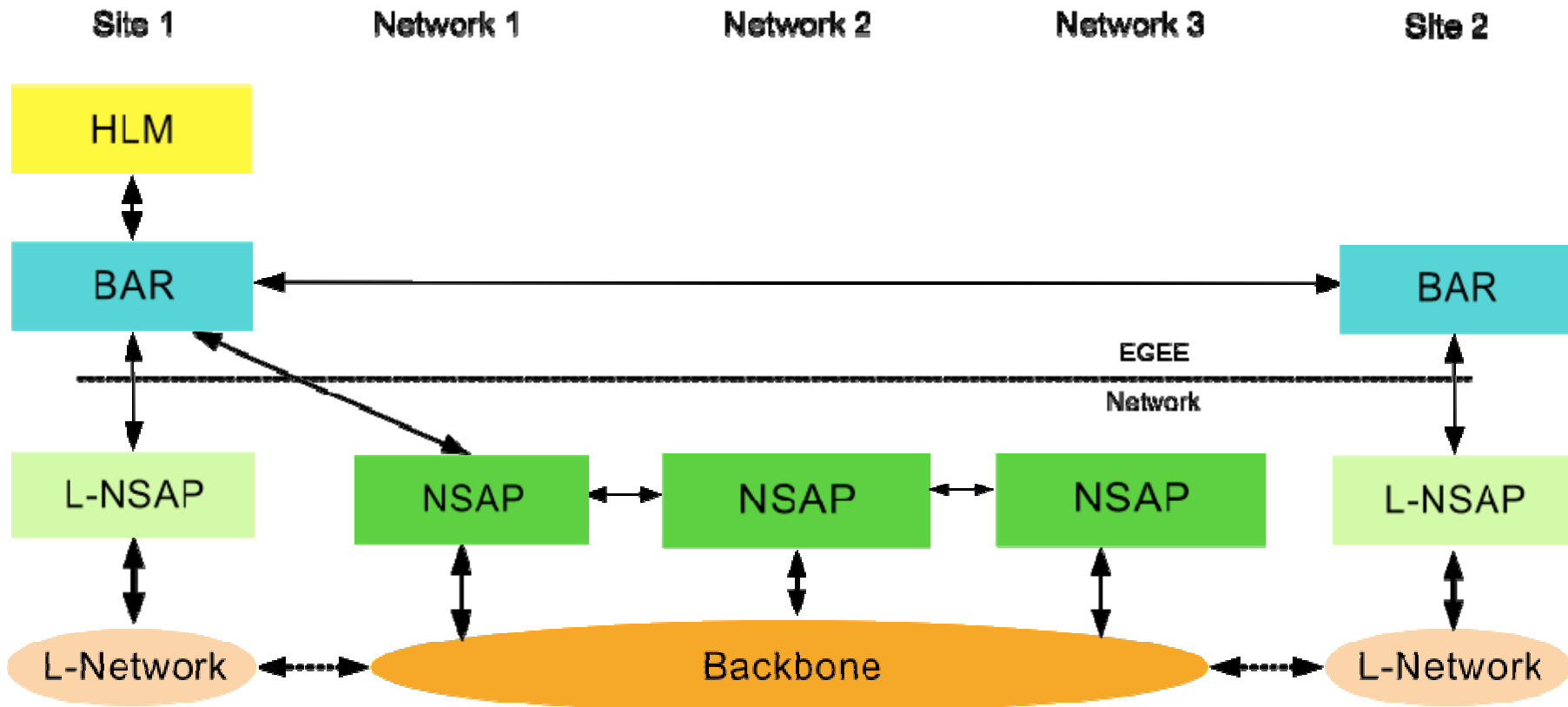
- EGEE SA1 data challenges is interested in network monitoring between CERN and the LCG Tier 1 sites.
- JRA4 is finalising e2emonit packaging, and will provide support for the SA1 deployment.

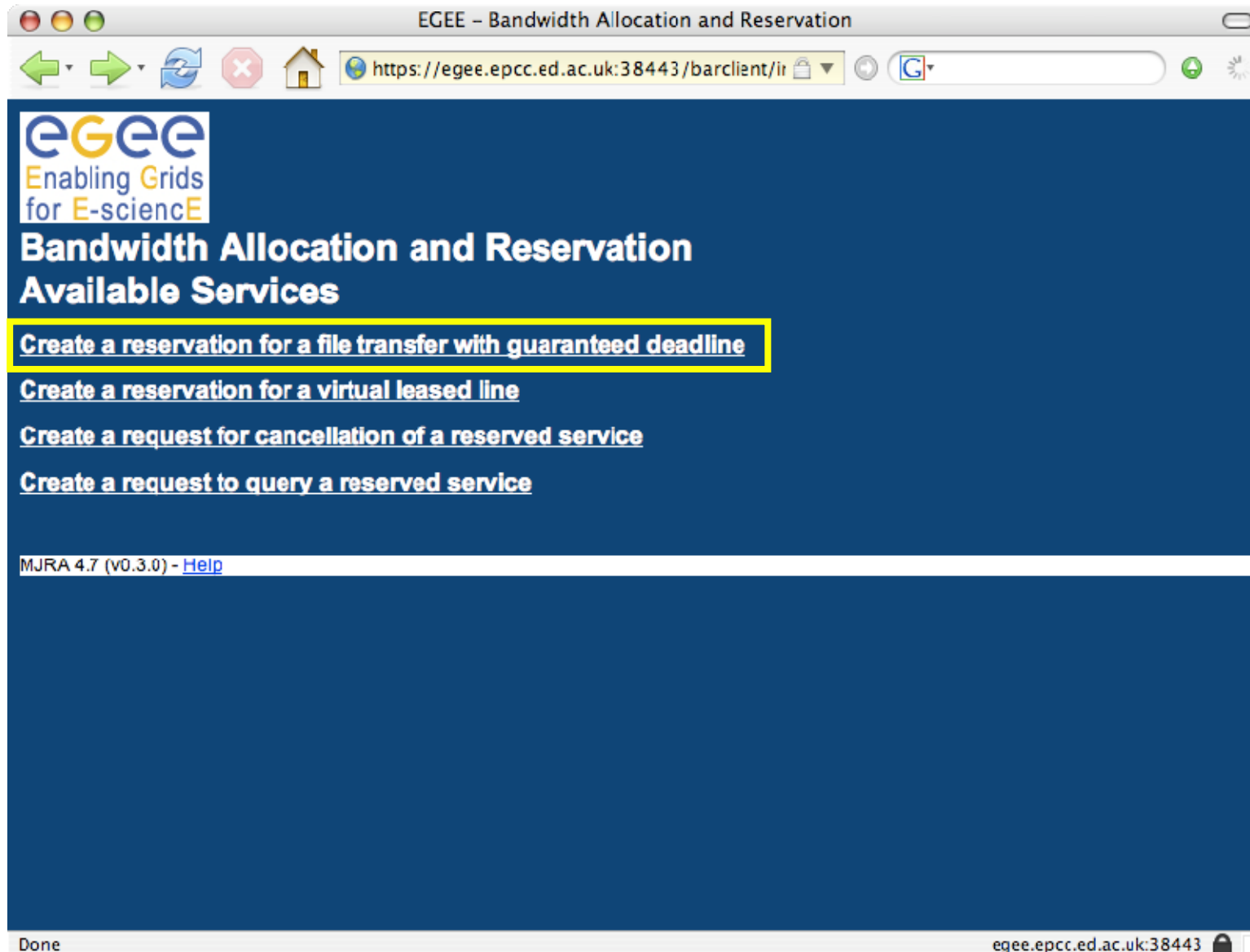


- Additionally, the possibility of accessing GridFTP usage data via the NPM services is under investigation.

- **To allow reservation of a network service between two endpoints**
  - Assuming underlying functionality from the network providers
- **For EGEE-1 the network service is “IP-Premium”**
- **Goal is to show first programmatic interface between EGEE and GEANT**
  - Unique working relationship with GEANT2 forged


- Two-stage process: Service Reservation
- Two-stage process: Service Activation



A screenshot of a web browser window titled "EGEE - Bandwidth Allocation and Reservation". The address bar shows the URL "https://egee.epcc.ed.ac.uk:38443/barclient/ir". The page content includes the EGEE logo and the text "Enabling Grids for E-science". Below this, the main heading is "Bandwidth Allocation and Reservation Available Services". A list of services is provided, with the first item, "Create a reservation for a file transfer with guaranteed deadline", highlighted with a yellow border. Other services include "Create a reservation for a virtual leased line", "Create a request for cancellation of a reserved service", and "Create a request to query a reserved service". At the bottom of the page, it says "MJRA 4.7 (v0.3.0) - [Help](#)". The browser status bar at the bottom shows "Done" on the left and "egee.epcc.ed.ac.uk:38443" on the right.

EGEE - Bandwidth Allocation and Reservation

[https://egee.epcc.ed.ac.uk:38443/barclient/ir](#)

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## Bandwidth Allocation and Reservation Available Services


- [Create a reservation for a file transfer with guaranteed deadline](#)**
- [Create a reservation for a virtual leased line](#)
- [Create a request for cancellation of a reserved service](#)
- [Create a request to query a reserved service](#)

MJRA 4.7 (v0.3.0) - [Help](#)

Done egee.epcc.ed.ac.uk:38443

Create Guaranteed Deadline File Transfer Reservation



https://egee.epcc.ed.ac.uk:38443/barclient/R



## Bandwidth Allocation and Reservation

### Create Guaranteed Deadline File Transfer Reservation

#### Reservation Detail

Source *	egee.epcc.ed.ac.uk
Destination *	pcl.rm1.garr.net
Start Date *	<input type="text"/> (DD / MM / YYYY) 
Start Time *	00:00
End Date *	<input type="text"/> (DD / MM / YYYY) 
End Time *	00:00
File Size *	<input type="text"/> KB (Integer value)


OK Cancel

\* - Mandatory Fields

Done egee.epcc.ed.ac.uk:38443

Create Guaranteed Deadline File Transfer Reservation

https://egee.epcc.ed.ac.uk:38443/barclient/R



**Bandwidth Allocation and Reservation**  
**Create Guaranteed Deadline File Transfer Reservation**

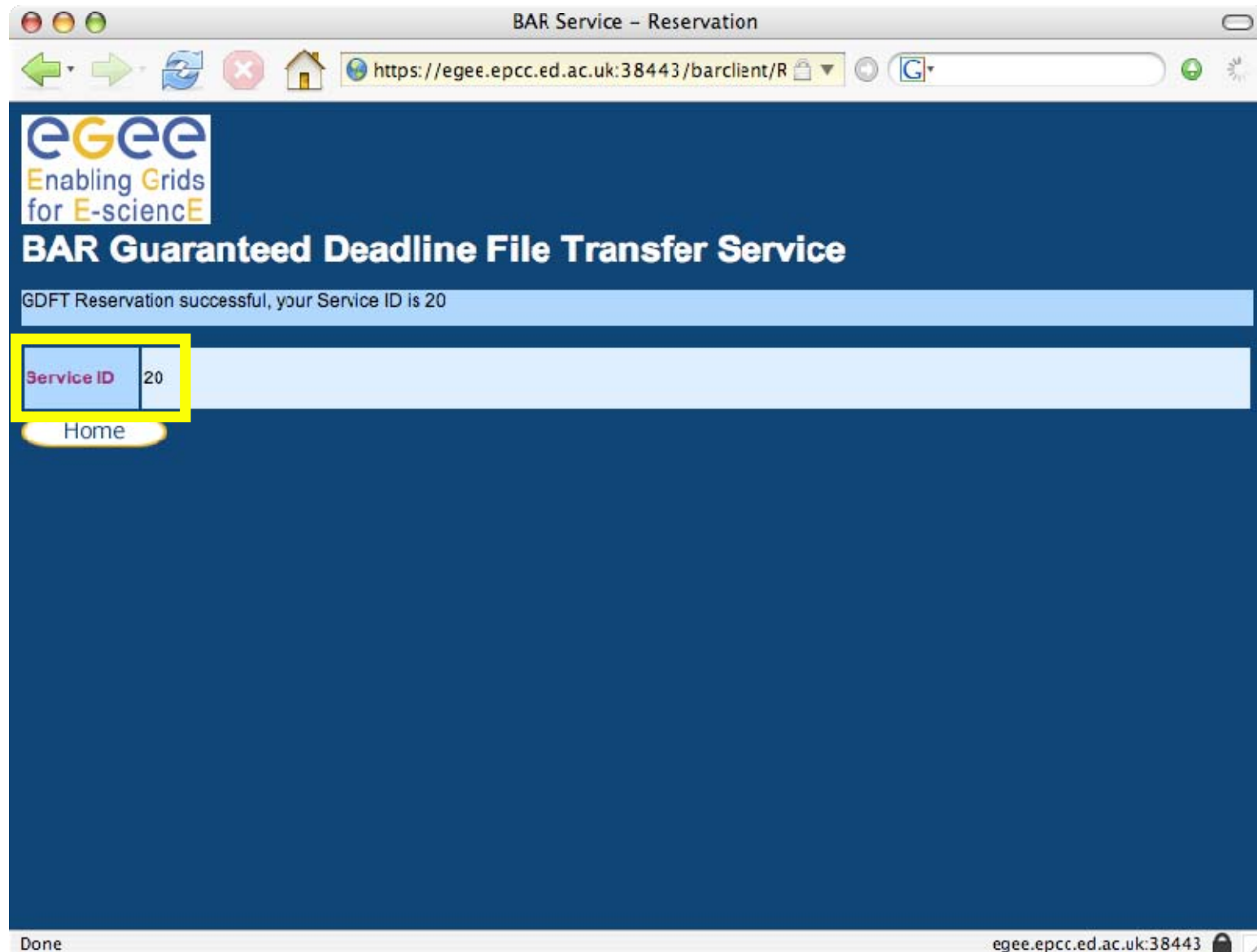
**Reservation Detail**

Source *	egee.epcc.ed.ac.uk
Destination *	mmedia.admin.grnet.gr
Start Date *	27/10/2005 (DD / MM / YYYY)
Start Time *	09:00
End Date *	27/10/2005 (DD / MM / YYYY)
End Time *	10:30
File Size *	15000000 KB (Integer value)

OK Cancel

\* - Mandatory Fields

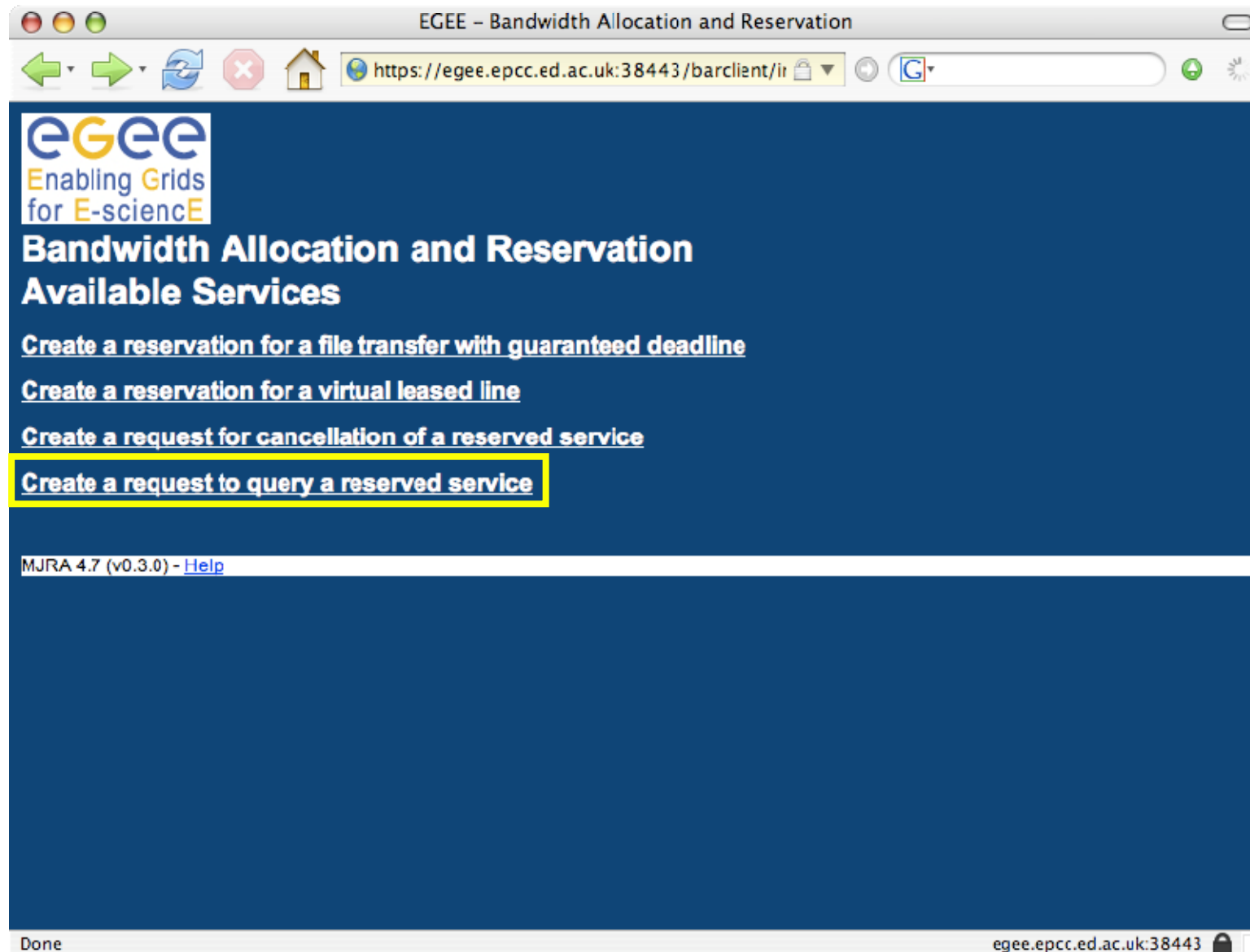
javascript:show\_calendar('frmReservationCreate StartDate'); egee.epcc.ed.ac.uk:38443

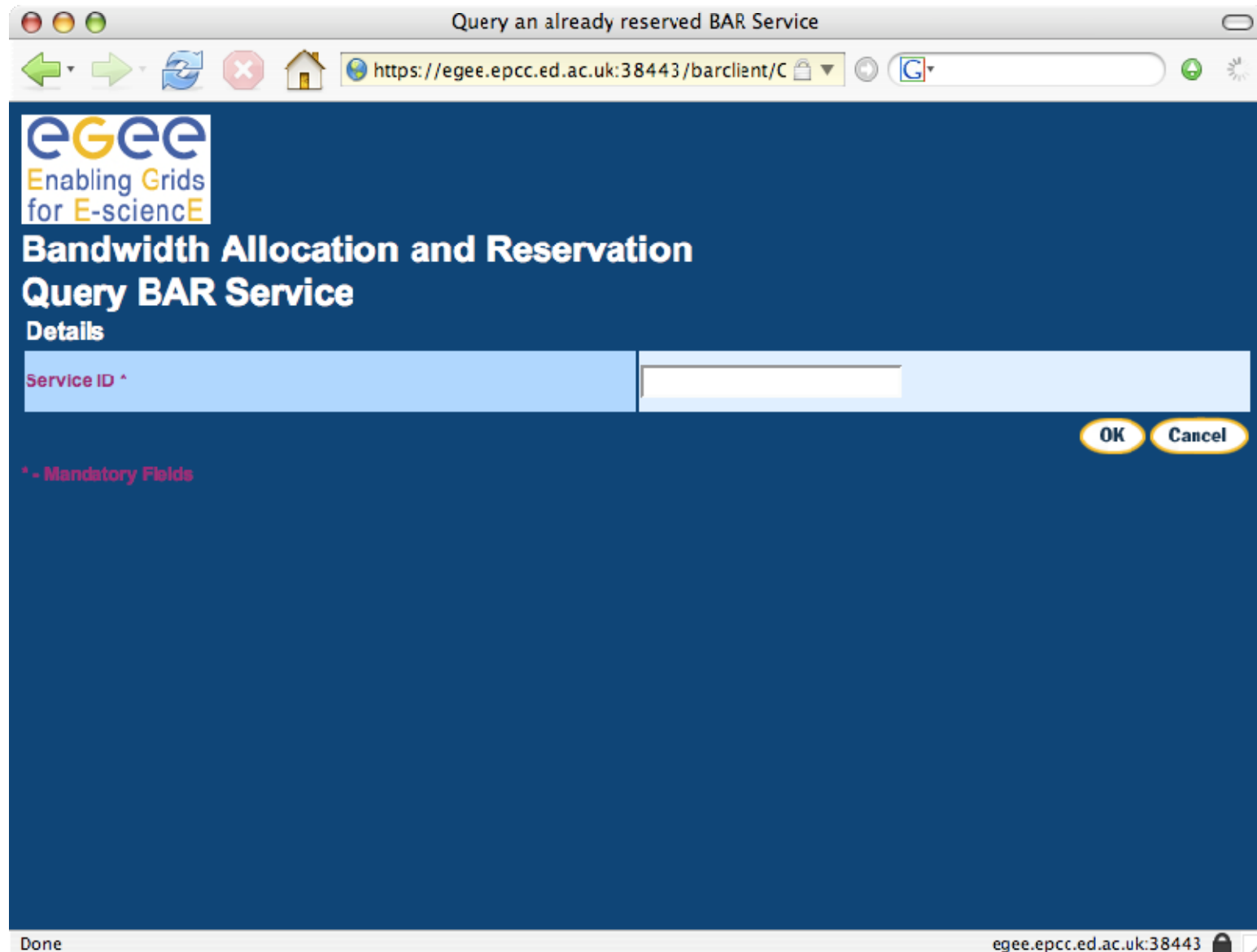
A screenshot of a web browser window titled 'BAR Service - Reservation'. The address bar shows the URL 'https://egee.epcc.ed.ac.uk:38443/barclient/R'. The page content includes the eGEE logo and the text 'BAR Guaranteed Deadline File Transfer Service'. A message states 'GDFT Reservation successful, your Service ID is 20'. Below this, a table displays the reservation details:

Service ID	20
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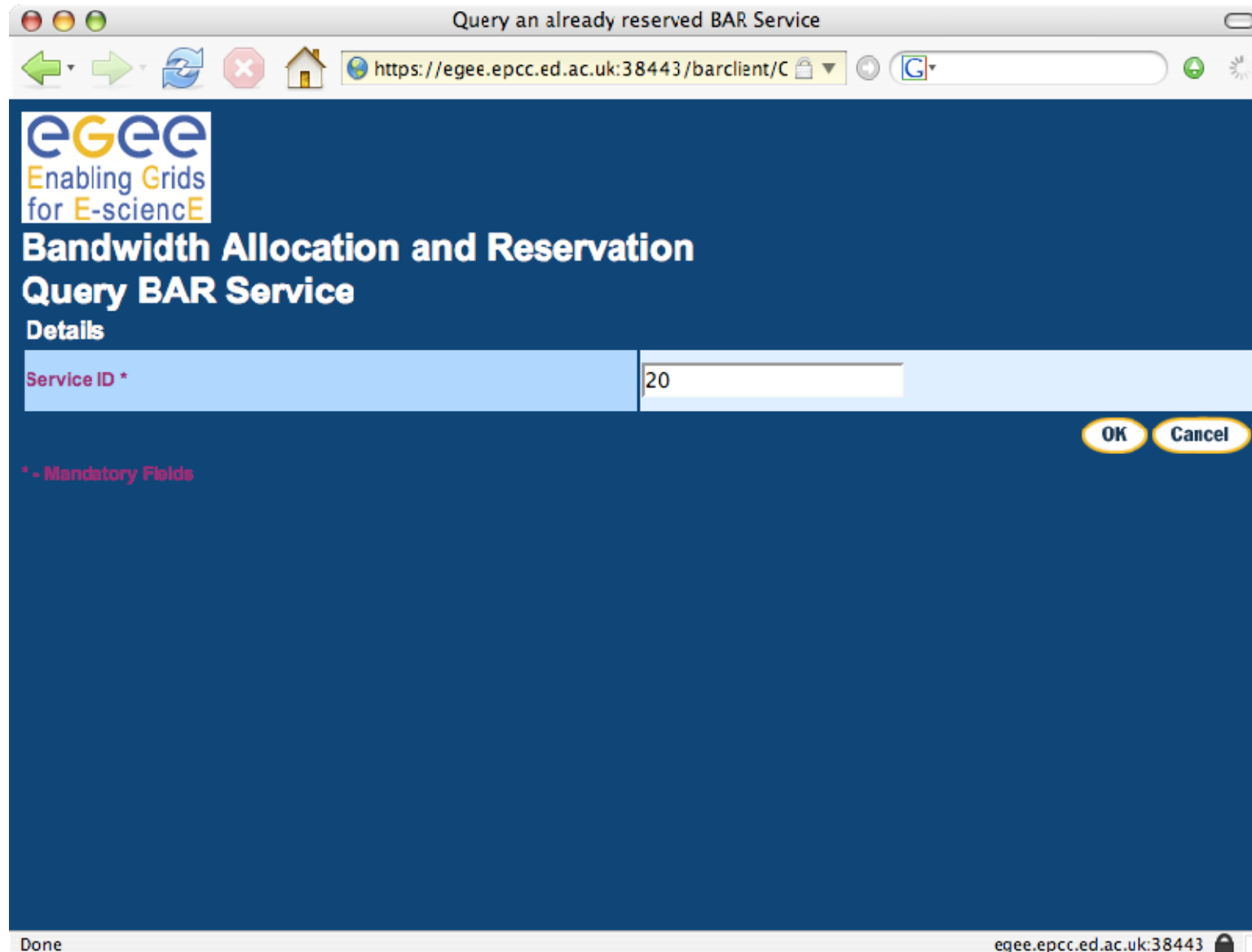
A yellow box highlights the 'Service ID' and '20' in the table. Below the table is a 'Home' button. The browser status bar at the bottom shows 'Done' and the URL 'egee.epcc.ed.ac.uk:38443'.



A screenshot of a web browser window. The title bar reads 'EGEE - Bandwidth Allocation and Reservation'. The address bar shows the URL 'https://egee.epcc.ed.ac.uk:38443/barclient/ir'. The main content area has a dark blue background with the eGEE logo and the text 'Enabling Grids for E-science'. Below this, the heading 'Bandwidth Allocation and Reservation Available Services' is displayed. A list of services is shown, with the first three items underlined: 'Create a reservation for a file transfer with guaranteed deadline', 'Create a reservation for a virtual leased line', and 'Create a request for cancellation of a reserved service'. The fourth item, 'Create a request to query a reserved service', is highlighted with a yellow border. At the bottom of the content area, there is a link for 'MJRA 4.7 (v0.3.0) - Help'. The browser's status bar at the bottom shows 'Done' on the left and 'egee.epcc.ed.ac.uk:38443' on the right.


A screenshot of a web browser window titled "Query an already reserved BAR Service". The browser's address bar shows the URL "https://egee.epcc.ed.ac.uk:38443/barclient/C". The page content includes the eGEE logo and the text "Enabling Grids for E-science". Below this, the main heading is "Bandwidth Allocation and Reservation Query BAR Service". Underneath, there is a section labeled "Details" containing a form with a single input field labeled "Service ID \*". To the right of the input field are two buttons: "OK" and "Cancel". A red asterisk and the text "\* - Mandatory Fields" are located below the input field. The browser's status bar at the bottom shows "Done" on the left and "egee.epcc.ed.ac.uk:38443" on the right.

# Fill in Service ID Number 20

A screenshot of a web browser window. The title bar reads "Query an already reserved BAR Service". The address bar shows the URL "https://egee.epcc.ed.ac.uk:38443/barclient/C". The page content includes the eGEE logo and the text "Enabling Grids for E-science". Below this is the heading "Bandwidth Allocation and Reservation Query BAR Service" and a sub-heading "Details". A form field labeled "Service ID \*" contains the number "20". To the right of the form are "OK" and "Cancel" buttons. A red asterisk with the text "\* - Mandatory Fields" is located below the form. The browser's status bar at the bottom shows "Done" on the left and "egee.epcc.ed.ac.uk:38443" on the right.

BAR Service - Reservation

https://egee.epcc.ed.ac.uk:38443/barclient/R



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## BAR Query Service

Query of service with ID 20 was successful

<b>Service ID</b>	20
<b>Status</b>	active
<b>Source / Type</b>	egee.epcc.ed.ac.uk / IPv4
<b>Destination / Type</b>	mmedia.admin.gnet.gr / IPv4
<b>Start Date and Time</b>	27 Oct 2006 09:00:00
<b>End Date and Time</b>	27 Oct 2006 10:30:00
<b>Bandwidth Forward</b>	45511.0 kbps
<b>Bandwidth Reverse</b>	4551.0 kbps

Home

Done egee.epcc.ed.ac.uk:38443

- **Work on the interfaces for Service Activation**
- **Update the NSAP interfaces to reflect GEANT2 changes**
- **Integrate with GEANT2 NSAP!**

- **JRA4 absorbed in SA1**
- **NPM continues**
  - This conference established the potential of the NPM work for Operations and fixed our position within SA1
  - EGEE-II work will include the hardening of e2emonit and the coordination of its deployment
  - Collaboration with middleware will also continue to provide network performance information to the WMS
- **BAR parks**