QMUL's TNE activities in China

Joint Programmes activities between London with Beijing and Nanchang

DR Yasir Alfadhl *Beng(Hons.) PhD(Lond.) MIET MIEEE*

School of Electronic Engineering & Computer Science, Queen Mary, University of London

Email: yasir.alfadhl@qmul.ac.uk

Queen Mary
University of London

Outline

- The JP model
- Network Issues/Challenges
- Past experiences
- Solutions
- Conclusions

What is the Joint Programme (JP)?

- JP - *Jointly* designed by the two universities to meet the requirements from both sides.

- QMUL+BUPT = QMBUPT JP (Dual award)
  - Telecommunications Engineering with Management
  - E-Commerce Engineering with Law
  - Internet of Things Engineering

- QMUL+Nanchang
  - Biomedical Sciences BSc from the University of London
  - Degree in Clinical Biomedicine from Nanchang University

‘Flying Faculty’ mode

- Over 500 annual student admissions;
- QM lecturers fly to Beijing to deliver the topic over 4 x 1-week blocks (~11 contact hours).
- Interactive online tutorials + meetings.

Scale of the JP (Beijing)

Comparison between QM and JP	JP	QM in London
Number of modules	25 (and project longer)	24
Lecture hours per module	44	33
Failures condoned	Nil	6
Short summer semester modules	3	-
Chinese compulsory modules	Must be passed	-
Personal development programme	Must be passed	-

Student access - same as students in London

- mySIS – record system (SITS)
  - Check personal details – registration
  - Print QM transcripts
- QMPlus
  - Virtual Learning Environment (VLE) – [Moodle].
  - JP started using it first.
  - Some issues
- Library – e-books, e-journals, etc

Network requirements

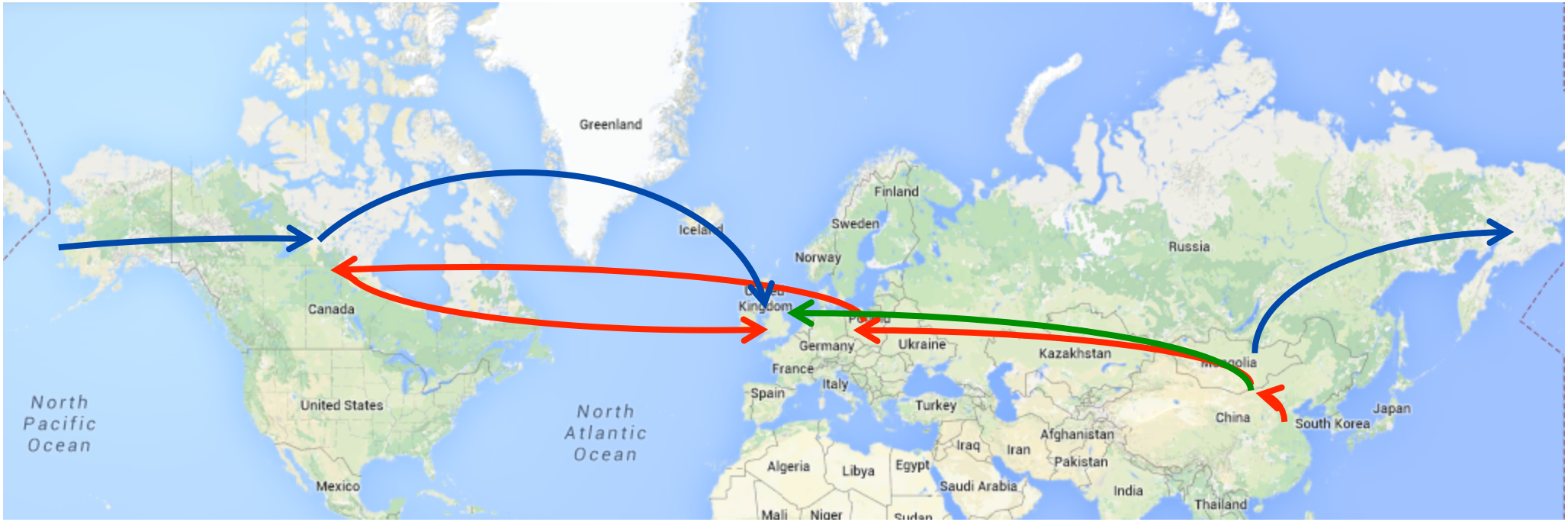
- E-mail systems

- Online meetings and tutorials
  - Lecturer's at QM can be contacted by IM, or video conferencing (Skype, Ominjoin, Lync, etc).

Network requirements/challenges

- Particular demand due to the 'flying professor' model.
  - Lectures, meetings, tutorials and general commms.
  - Distributed staffing
- Public networks route via the US to Europe
  - Delays and packet loss
  - Worst at peak demand (load)
- Different networks for students when off-campus.

Possible paths from public networks



Issues…

We need to establish what we will consider a "fix" for these problems. Much of the reporting around performance was based on reports of "slowness" with few quantitative measurements. Similarly we are aware that there were problems with login failures due to technology problems but we are also aware of user/password mismatches and issues around registration in QMplus and SITS.

Subject: [jp-qm-staff] [jp-qm-teaching] JP student mailbox issues

Dear All
Some students have been trying to send me work using the bupt mailbox e.g. jpxxxxxx@bupt.edu.cn – most emails haven't arrived (and the students haven't had any notification of non-delivery), although one has after a delay. Apparently the queen mary mailbox works fine, e.g. jpxxxxxx@qmul.ac.uk, as do other accounts.

The tunnel between QM and BUPT has been unreliable over the last few days with the problem being at the QM end.
[redacted] in IT Services has been working very hard to put in a replacement router and this is in place now and should be working.

Reminder that the JP exam board is tomorrow morning – 8.30 am UK time in 203 for those joining internally.

For remote access we will use Skype – add "[redacted]" to your skype contacts and wait for the request to join. As there is work on improving the IPv6 connection between JANET and the London MAN that morning it is unlikely we will use video as BUPT might be working on a 3G connection.

Trace example

- From HongFu – round the world path:
  - Possible route: China Unicom → China Mobile → Germany → US → London.

```
Tracing route to idp.shibboleth.qmul.ac.uk [138.37.7.91]
over a maximum of 30 hops:

  1     4 ms     2 ms     2 ms  yasir-x230 [192.168.171.1
  2     4 ms     4 ms     2 ms  yasir-x230 [172.16.1.1]
  3     5 ms     1 ms     1 ms  192.168.80.2
  4     *        *        *     Request timed out.
  5     8 ms     4 ms     5 ms  218.205.186.217
  6    41 ms     6 ms     4 ms  61.148.148.101
  7    11 ms     6 ms     6 ms  61.148.152.145
  8     9 ms     5 ms     5 ms  211.136.94.17
  9     *        *        9 ms  221.179.171.145
 10    27 ms    27 ms    25 ms  219.158.97.202
 11    34 ms    27 ms    26 ms  219.158.97.174
 12   134 ms    42 ms    37 ms  221.176.18.114
 13    38 ms    39 ms    37 ms  221.176.24.154
 14    43 ms    41 ms    40 ms  211.136.1.109
 15    44 ms   230 ms   305 ms  223.118.2.74
 16   432 ms   200 ms   306 ms  xe-8-1-0.edge5.LosAngeles
.85]
 17   349 ms   372 ms   407 ms  vlan60.csw1.LosAngeles1.L

 18   412 ms   407 ms   409 ms  ae-62-62.ebr2.LosAngeles1
7]
 19   422 ms   407 ms   407 ms  ae-62-62.ebr2.LosAngeles1
7]
 20   508 ms   509 ms   509 ms  huckleberry-ebr3.core-net
08]
 21   433 ms   405 ms   408 ms  ae-7-7.ebr3.Atlanta2.Leve
 22   409 ms   407 ms   407 ms  idp.shibboleth.qmul.ac.uk

Trace complete.
```

```
Tracing route to w01.qmulmoodle.wf.ulcc.ac.uk [128.86.133.105]
over a maximum of 30 hops:

  1     4 ms     2 ms     2 ms  yasir-x230 [192.168.171.1]
  2    92 ms     3 ms     2 ms  yasir-x230 [172.16.1.1]
  3     3 ms     1 ms     1 ms  192.168.80.2
  4     *        *        *     Request timed out.
  5     5 ms     3 ms     2 ms  123.124.18.17
  6     7 ms     5 ms     5 ms  221.179.171.17
  7    11 ms     6 ms     5 ms  123.126.6.157
  8     9 ms     5 ms     6 ms  211.136.94.17
  9     6 ms     5 ms     5 ms  221.179.171.145
 10     9 ms     9 ms    11 ms  219.158.101.50
 11    35 ms    36 ms    35 ms  221.176.15.6
 12   405 ms   407 ms   357 ms  219.158.102.146
 13    44 ms    38 ms    39 ms  221.176.24.230
 14   361 ms   375 ms   404 ms  xe-0-0-1.lon10.ip4.tinet.net [89.149.186.210]
 15    42 ms    41 ms    41 ms  tenge2-1.br01.hkg15.pccwbtn.net [63.218.211.37]

 16   348 ms     *        *     ae29.londtw-sbr1.ja.net [146.97.33.9]
 17   402 ms   407 ms   407 ms  london.londtw-sbr1.ja.net [146.97.37.210]
 18   408 ms   419 ms   407 ms  ulcc-1.ja.net [146.97.137.54]
 19   427 ms   404 ms   408 ms  fw.ulcc.net [128.86.200.178]
 20   316 ms     *      321 ms  ae29.londpg-sbr1.ja.net [146.97.33.2]
 21     *        *        *     Request timed out.
 22     *        *        *     Request timed out.
 23   403 ms   407 ms   407 ms  ulcc-1.ja.net [146.97.137.54]
 24     *        *        *     Request timed out.
 25     *        *        *     Request timed out.
 26     *        *        *     Request timed out.
 27     *        *        *     Request timed out.
 28     *        *        *     Request timed out.
 29     *        *        *     Request timed out.
 30     *        *        *     Request timed out.

Trace complete.
```

CERNET westwards to JANET

- Traffic to QM and to QMPlus (which is at ULCC) is routed directly over CERNET giving reasonable latency (180ms against the 350ms we had before).

```
C:\Windows\system32>tracert qmplus.qmul.ac.uk

Tracing route to w01.qmulmoodle.wf.ulcc.ac.uk [128.86.133.105]
over a maximum of 30 hops:

  1     2 ms     2 ms     2 ms  10.125.106.1
  2     7 ms     5 ms     3 ms  10.1.1.1
  3     3 ms     7 ms     2 ms  10.0.11.1
  4     8 ms     2 ms     2 ms  10.0.1.1
  5     5 ms     2 ms     2 ms  172.16.4.5
  6     *        4 ms     6 ms  172.16.3.1
  7     *        3 ms     *     202.112.42.1
  8     3 ms     3 ms     4 ms  101.4.116.81
  9     3 ms     3 ms     4 ms  101.4.112.97
 10    16 ms     6 ms     7 ms  101.4.116.134
 11     4 ms     3 ms     3 ms  101.4.115.225
 12     4 ms     3 ms     3 ms  202.112.53.18
 13     6 ms     8 ms    10 ms  210.25.189.65
 14     3 ms     4 ms     3 ms  210.25.189.18
 15   176 ms   176 ms   225 ms  orientplus-gw.mx1.lon.uk.geant.net [62.40.125.10
1]
 16   181 ms   193 ms   182 ms  janet-gw.mx1.lon.uk.geant.net [62.40.124.198]
 17   180 ms   178 ms   178 ms  ae29.londpg-sbr1.ja.net [146.97.33.2]
 18   182 ms   180 ms   184 ms  146.97.37.198
 19   178 ms   179 ms   178 ms  be2.londsh-rbr1.ja.net [146.97.66.33]
 20   181 ms   181 ms   185 ms  146.97.137.54
 21   178 ms   179 ms   178 ms  128.86.200.178
 22     *        *        *     Request timed out.
 23     *        *        *     Request timed out.
 24     *        *        *     Request timed out.
 25     *        *        *     Request timed out.
 26     *        *        *     Request timed out.
 27     *        *        *     Request timed out.
 28     *        *        *     Request timed out.
 29     *        *        *     Request timed out.
 30     *        *        *     Request timed out.

Trace complete.
```

Improved traffic

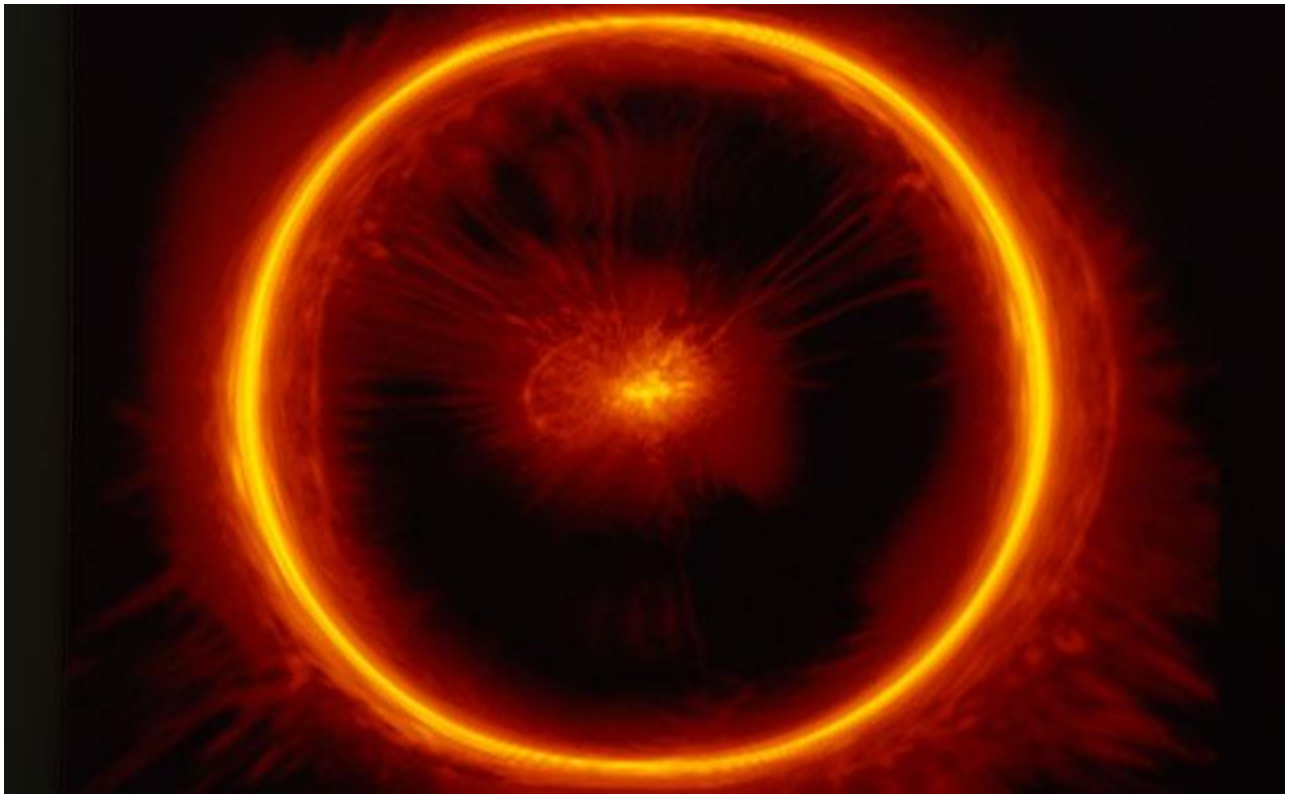
- Ideally, all traffic with improved Latency and BW.

http://www.orientplus.eu/

Conclusions

- "Uncontrolled" network path between the China/UK sites.
- Network demand to meet the characteristics and requirements of the JP model.
- Several solutions were tested.
- Collaborative work between JANET and CERNET can resolve the network issues with Beijing → Better TNE experience!

Thanks for your attention!



* Source: bbc.co.uk