GridMon – Grid Network Performance Monitoring for UK e-Science

AllHands 2003 – Thursday 4th September 2003
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Review – Brief

“…design and deploy an infrastructure for network performance monitoring within the UK e-Science community.”

Became…

• Kit of monitoring tools to be deployed at each e-Science centre, focusing on:
  – Publication to Grid middleware
  – Visualisation for humans
  – End-to-end performance (what users see)
Progress:

• Building on EDG work, initial presence of toolkit established at 12 original e-Science Centres
• As always, some problems – being debugged
• SLAC tools to be trialled between RAL-DL: have needed to allay people’s fear over b/w intrusion
Review - Conclusion

- Well received
- Interest growing (e.g. UK HEP groups)
- Experience feeding into other projects
- Beginning to feed back into EDG

Good foundations laid
New Work I: web service

- Essentially, an online application accessed using XML...
- ...which makes it easier for other apps to use yours...
- ...which allows the Grid middleware to access our data
New Work I: web service

• How it works….

1. WSP registers service with registry
2. Client locates suitable service using registry
3. Client requests WSDL doc
4. WSDL tells client how to interact
5. Service and client interact using XML messages, sent via SOAP
New Work I: web service

For those interested in implementation:

- **index.jsp**
- **results.jsp**
- **Java Bean**
- **SOAP**
  - metric value/msg
  - secs since epoch
  - site (hostname)

**LIVEish demo**
New Work I: web service

Interesting points:

• Retiring flat files and adopting RDBMS storage (e.g. R-GMA) would allow complex searches.
• WSDL should be extensible to more fully describe capabilities of web service: allowable options etc.
• Proof that it’s not as easy as some people suggest
• Schemas (e.g. GGF-NMWG) will hopefully clarify some things: standardisation
• In conclusion, good starting point, which can be extended wrt views of NMWG & other net mon projects: schemas, Grid service etc. etc.

Mark Leese
Daresbury Laboratory
New Work II: TCP Tuning

- TCP doesn’t scale up to LFNs
- Long = high RTT       Fat = high b/w
- Inefficient and wasteful…trust me
- Given problems, any help appreciated, so…
- Demo TCP best practice to users – “this is what you can achieve, if you ‘tune’ your machine like this…”
- No new fangled gizmos
- User tunable
- Already have installed base
- Work has begun: example…
New Work II: TCP Tuning

RAL → DL: Intel to 3Com (Broadcom 5700)

- DL enables window scaling
- Enable SACK
- Increase txqueuelen
- Increase tcp_mem

- ‘Standard’ values set & options disabled
- RAL: enable window scaling, increase Tx window size & assoc. buffer
- DL: increase Rx window size & assoc. buffer

Mark Leese
Daresbury Laboratory
New Work II: TCP Tuning

Enable jumbo frames at RAL

Iperf Bandwidth Measurements (1048576 byte socket buffer)
Measured from rt1in1.dl.ac.uk

Bandwidth (Mbits/sec)

0 50 100 150 200 250 300 350 400 450

16/8 17/8 18/8 19/8 20/8 21/8 22/8 23/8 24/8 25/8 26/8 27/8 28/8 29/8

time intervals in days from Sat Aug 16 0:28:10 2003

Mark Leese
Daresbury Laboratory
(Some of the) Future Work

• Web and Grid service:
  – GGF-NMWG & schemas
  – R-GMA
  – add OGSA-DAI support

• Collaborations
  (more info in paper):

Multi-domain network monitoring

US
Internet2
piPEs

UK
UCL&DL
P’n’P

€
Dante
inter-
domain

Mark Leese
Daresbury Laboratory
Conclusion

• Gone well so far
  – Starting to show worth
  – Growing in popularity
  – Experience feeding into other projects
  – Slowly evolving into “best of breed” solution

• New work has real benefits

• Paul: collaborations have great potential

Much is possible given time
Questions

m.j.leese@dl.ac.uk
http://gridmon.dl.ac.uk/

Mark Leese
Daresbury Laboratory