EduPERT—Helping European Researchers Bridge the Wizard Gap

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Why is e2e performance hard?

- Multiple layers of systems with complex interactions
  - Applications, OS, disks/memory/network adapters, networks including middleboxes such as firewalls/rate shapers etc.
- Multiple network domains
  - Campus LAN, regional/national/international backbones
- Defensive support organisations
  - “finger-pointing loops”
  - (my part of the network works fine, so it must be X!)
What is a PERT?

- PERT = “Performance Enhancement/Response Team”
- “like a CERT, but for performance problems”
- Assists users of research networks with performance issues by
  - Understanding users' goals/requirements
  - Taking responsibility for performance issues (“ownership”)
  - Applying holistic (cross-layer) thinking
  - Suggesting or performing diagnostics
  - Coordinating with NOCs/PERTs/... in different domains
  - Identifying bottlenecks and suggesting improvements
Brief history of the (edu)PERT

2001: PERT idea first brainstormed.

2002: pilot GÉANT PERT - DANTE & a few NRENs

2004 - 2008: GÉANT2 PERT (rotating duty)

Since September 2008: eduPERT (federated PERT)
What is eduPERT?

• The new *federated* model for PERT work in the GÉANT community:
• Distributed (NREN/campus/large project) PERTs—close to users
• Supported by central services/elements:
  – Common policy (GN2 DS3.12.4)
  – Registry and accreditation ([edupert.geant.net](http://edupert.geant.net))
  – ~Yearly PERT Training workshops
  – Meetings for information exchange
  – PERT Knowledge Base—[kb.pert.geant.net](http://kb.pert.geant.net)
  – Central reporting through GÉANT Monthly Service Reports
GN2 PERT experience feedback

- Contacted in advance, PERT can sanity-check user's performance expectations and give them general hints as to what traps to avoid.
- In complex failure scenarios, PERT can coordinate measurements across multiple domains, and sometimes uncover hidden network problems that concern many other users (FNAL-DESY).
Challenges for eduPERT

• Keep up momentum without a strong core
  – The GN2 “centralised PERT” with rotating duty and a common PTS (PERT Ticket System) was a strong catalyst for cooperation and information exchange

Ideas for addressing this:
  – Continue successful training events
  – Have open eduPERT meetings for inter-PERT networking
    • But where?
  – Improve information flow through better reporting
  – Preserve collective wisdom through PERT KB development

• Continue expanding the scope
  – Convince European NRENs that running a PERT is worthwhile
  – Other regions, large projects, campus networks...
Upcoming Challenges for PERTs

- Moving to a parallel (multicore/manycore/cluster) world
- High-performance applications moving to clouds (e.g. Amazon S3/EC2)
- Virtualisation
- VPNs
- Wireless/mobile applications
- Sensors in remote places (seismometers, weather stations etc.)
Why you should have a PERT (version for managers)

- Potential to create positive “Moments of Truth” for your constituency
- Differentiates your service from commodity offerings
- Interesting work helps retain senior network engineers
- Synergies across your organisation (network/systems/applications)
Why you should have a PERT (version for engineers)

- You'll help your network's users do exciting things
- You'll learn new skills that are widely applicable
- It's rewarding if you don't mind occasional direct contact with users
- It's technically challenging and generally fun!
How to cooperate

- Learn from each other, exchange experiences and do joined workshops
- Subscribe to: pert-discuss@geant.net
  Archive (userid/password needed): http://mail.geant.net/mailman/private/pert-discuss/
- If considering running a PERT, register yourself so that it appears on the PERT list: http://edupert.geant.net/
  Send e-mail to Simon Leinen: simon.leinen@switch.ch
- Check out the PERT Knowledge Base: http://kb.pert.geant.net/