E2EPI Network Performance Workshop

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Agenda

- Welcome and Thanks
  - http://e2epi.internet2.edu/net-perf-wkshp/jt06/agenda.html
- Your Goals
- Problem Statement
- A Call to Collaborative Action
- Performance Measurement
- Our Goals

Your Goals

- What are your goals for this workshop?
  - Help me get a handle on performance problems in my network?
  - Reduce the cost of addressing a complaint about performance?
  - Other?
- We do not have a magic bullet.
- We hope that some of the tools we have will assist you in your goals.
- This workshop is as much a learning experience for us as it is for you.

Problem Statement: "The Network is Broken"

- How the can user self-diagnosis first mile problems without being a network expert?
- How can the user do partial path decomposition across multiple administrative domains?

Self-Diagnosis

- Find a measurement server “near me”.
- Detect common tests in first mile.
- Don’t need to be a network engineer.
- Instead of:
  - “The network is broken.”
- Hoped for result:
  - “I don’t know what I’m talking about, but I think I have a duplex mismatch problem.”

Partial Path Decomposition (1)

- Identify end-to-end path.
- Discover measurement nodes “near to” and “representative of” hops along the route.
- Authenticate to multiple measurement domains (locally-defined policies).
- Initiate tests between remote hosts.
- See test data for already run tests. (Future)

Partial Path Decomposition (2)

- Instead of:
  - “Can you give me an account on your machine?”
  - “Can you set up and leave up and Iperf server?”
  - “Can you get up at 2 AM to start up Iperf?”
  - “Can you make up a policy on the fly for just me?”
- Hoped for result:
  - Regular means of authentication
  - Measurement peering agreements
  - No chance of polluted test results
  - Regular and consistent policy for access and limits

The Importance of Measurement

- Bandwidth alone does not resolve all performance problems but technical tools and best practices for high performance are recognized and proven
- Through (regular) performance monitoring problems can be quickly identified and located thus facilitating resolution.
- Testing and measuring performance increases value of network to all participants.

E2E piPEs Goals

Recognizing these needs E2E piPEs strives to:

- Enable end-users & network operators to:
  - determine E2E performance capabilities
  - locate E2E problems
  - contact the right person to get an E2E problem resolved.
- Enable remote initiation of partial path performance tests
- Make partial path performance data publicly available (Abilene today, other networks in the future)
- Be interoperable with other performance measurement frameworks

Metcalf's Law

- But to do all that, there have to be deployed measurement nodes "out there"
  - http://e2epi.internet2.edu/pipes/pmp/pmp-dir.html
- Robert Metcalf's law states that the "value" or "power" of a network increases in proportion to the square of the number of nodes on the network.
- Our version: The value of a performance measurement framework scales with the square of the deployment footprint

Performance Measurement: Project Phases

- Phase 1: Tool Beacons (Today)
  - BWCTL (Complete), http://e2epi.internet2.edu/bwctl
  - OWAMP (Complete), http://e2epi.internet2.edu/owamp
  - NDT (Complete), http://e2epi.internet2.edu/ndt
- Phase 2: Measurement Domain Support
  - General Measurement Infrastructure (Prototype in Progress)
  - Abilene Measurement Infrastructure Deployment (Complete), http://abilene.internet2.edu/observatory
- Phase 3: Federation Support (Future)
  - AA (Prototype – optional AES key, policy file, limits file)
  - Discovery (Measurement Nodes, Databases) (Prototype – nearest NDT server, web page)
  - Test Request/Response Schema Support (Prototype – GGF NMWG Schema)

Our Goals

- Provide value to the Internet2 membership
- Increase the footprint of deployment
- Iteratively rewrite this workshop:
  - “How to Deploy Performance Tools”
  - “How to Integrate Performance Tools into the IT Process”
  - “Expected Return on Investment”
- We need your help and the help of future participants to do bullet #2 and #3 “right.”