



E2EPI Network Performance Workshop

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Agenda

- Welcome and Thanks
 - <http://e2epi.internet2.edu/network-perf-wk/gatech/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 can the user self-diagnose 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

Metcalfe'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 Metcalfe'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

■ 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.”