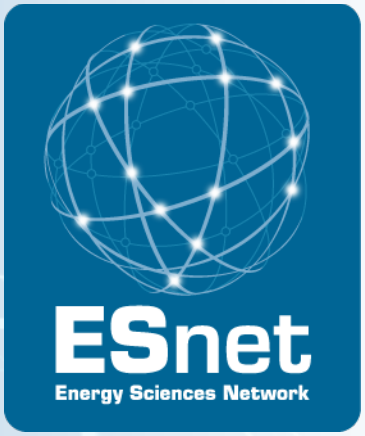

DICE Diagnostic Service

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Background

Each of the DICE collaborators are defining and delivering services to their users. A subset of these services will be a lot more useful for everyone if all of the DICE participants deploy them in an interoperable fashion.

A decision was made last winter to add more rigor or structure to our collaborative efforts and focus on a small set of services.

- Network Diagnostic Service
- Dynamic Circuit Provisioning Service
- End user performance portal service

DICE Network Diagnostic Service

The DICE Network Diagnostic service is an *agreement* between Internet2, ESnet, GEANT, Canarie & USLHCnet to deploy, support and use a interoperable subset of perfSONAR network measurement tools across our backbones to simplify diagnosing inter-domain network performance problems.

The target user community for these services is the network engineers in our respective NOCs, and the engineers at around a dozen other transit networks selected from European NRENs (coordinated by GEANT) and Gigapops or Regionals (coordinated by Internet2)

The measurement services included in the DICE service are intended to be the minimal useful interoperable subset of the measurement services that each domain is offering to their community.

The Diagnostic Service Includes

Definitions of the Service

- Active latency & bandwidth measurement points
- Historical latency and bandwidth measurement archives
- Recommended measurement schedules, parameters & limits

Service Level Specifications

- Incident, problem, change management
- Reporting details

Operational Level Agreements

- Dealing with target availability goals, outage notification, etc
- AA (very lightweight.)

Agreements about Jointly Operated Service Elements

What are we actually ‘deploying’?

Bandwidth measurement services

- 10G* capable measurement points near network borders
- Regularly scheduled TCP tests between domains
  - 4 tests per day
  - TCP
  - Using Cubic, BIC or another aggressive TCP stack
  - Long enough to get out of slow start (20-30 seconds)
  - Large TCP windows
  - Best effort QOS tags
- Results will be archived & published via perfSONAR

What are we actually ‘deploying’?

Latency measurement services

- Measurement points near domain borders
- Active one-way tests between domains at 10 pps
- Archives of historical results
- Target accuracy of clocks for 1-way tests is better than 1ms.

Lookup Service

- Provides a mechanism to find services

Looking Glass Service

- Standard looking glass to look at current info from routers

And, all business processes to support the services…

Provide user interfaces and training to our NOC engineers so they can effectively use these services for diagnosing performance problems

Monitoring the services, coordinating outages, responding to failures, supporting users, and all of the other things involved with running a production service.

Primary changes of the deployed ESnet measurement infrastructure to support the DICE Diagnostic Service

- Change TCP stack used for scheduled bandwidth tests from Reno to a more aggressive stack like BIC or Cubic
- Configure inter-domain bandwidth tests to use best effort instead of scavenger DSCP
- Expand the metadata bandwidth measurement points register with the lookup service to include info like TCP stack, interface speed, version numbers, etc.
- Support invoking bandwidth & latency tests via the XML perfSONAR protocol in addition to the bwctl & owamp protocols used today
- Deploy a router looking glass

Additional Slides about the DICE Services for ESCC talk.

DICE Dynamic Circuit Service

The goal of the dynamic circuit service is to support automatic provisioning of dynamic circuits across multiple domains

- Primary participants are ESnet, Internet2, GEANT & USLHCnet
  - 5-6 European NRENs participation will be coordinated by GEANT
  - 4-6 Regionals or Gigapops participation will be coordinated by Internet2
- Initially using OSCARS & AutoBahn & version 1.1 of the IDC protocol
- Dynamic circuits will transport VLAN tagged frames
- Will support monitoring of dynamic circuits
- The target users of the pilot service will be the NOC engineers in the participating domains.

DICE End User Performance Portal

The goals of the performance portal are to educate end users by:

- Explaining basic concepts about network performance
- Help them determine if what they want to do is feasible
- Demonstrating what the network is capable of doing
- Help them distinguish between good and bad network performance
- Provide guidance on where to go for help

- The target community is the **non-technical** end users. (ie humanities professors, not high energy physicists!)