June 14th, LHCOPN/LHCONE Meeting
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LHCONE Monitoring Thoughts

LHCONE Monitoring

- LHCONE Monitoring = Hard Problem(?)

- Current Use Case: USATLAS

- Possible Solutions

INTERNET2

Hard Problem To Solve?

- Participants
  - Multiple Domains (e.g. Building, Campus, Regional, Backbone, Exchange Point)
  - Multiple Parties (e.g. VO management, Local/Regional/National IT staff)
- Technologies
  - Monitoring at all layers of the OSI stack (e.g. light levels all the way up to application performance)
- Governance
  - Conversations about this over last 2 days – who runs LHCONE? Can someone enforce monitoring rules?
  - Value add: installation of monitoring tools and someone to ensure they work
  - Some central facility to manage the tickets/process?

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# LHCONE Monitoring

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USATLAS

- Hardware/Software
  - perfSONAR-PS Performance Toolkit (http://psps.perfsonar.net/toolkit)
  - 2 Dedicated Machines per T1 and T2 (Bandwidth and Latency Monitoring)
- Use Case
  - Regular full mesh testing (OWAMP/BWCTL/PingER)
  - Diagnostic tools on demand (NDT/NPAD)
  - Alarms built using NAGIOS
    - Throughput drops below threshold
    - Loss/Latency increase beyond threshold
    - Monitoring hosts/services become unreachable

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USATLAS – Setting Up Tests
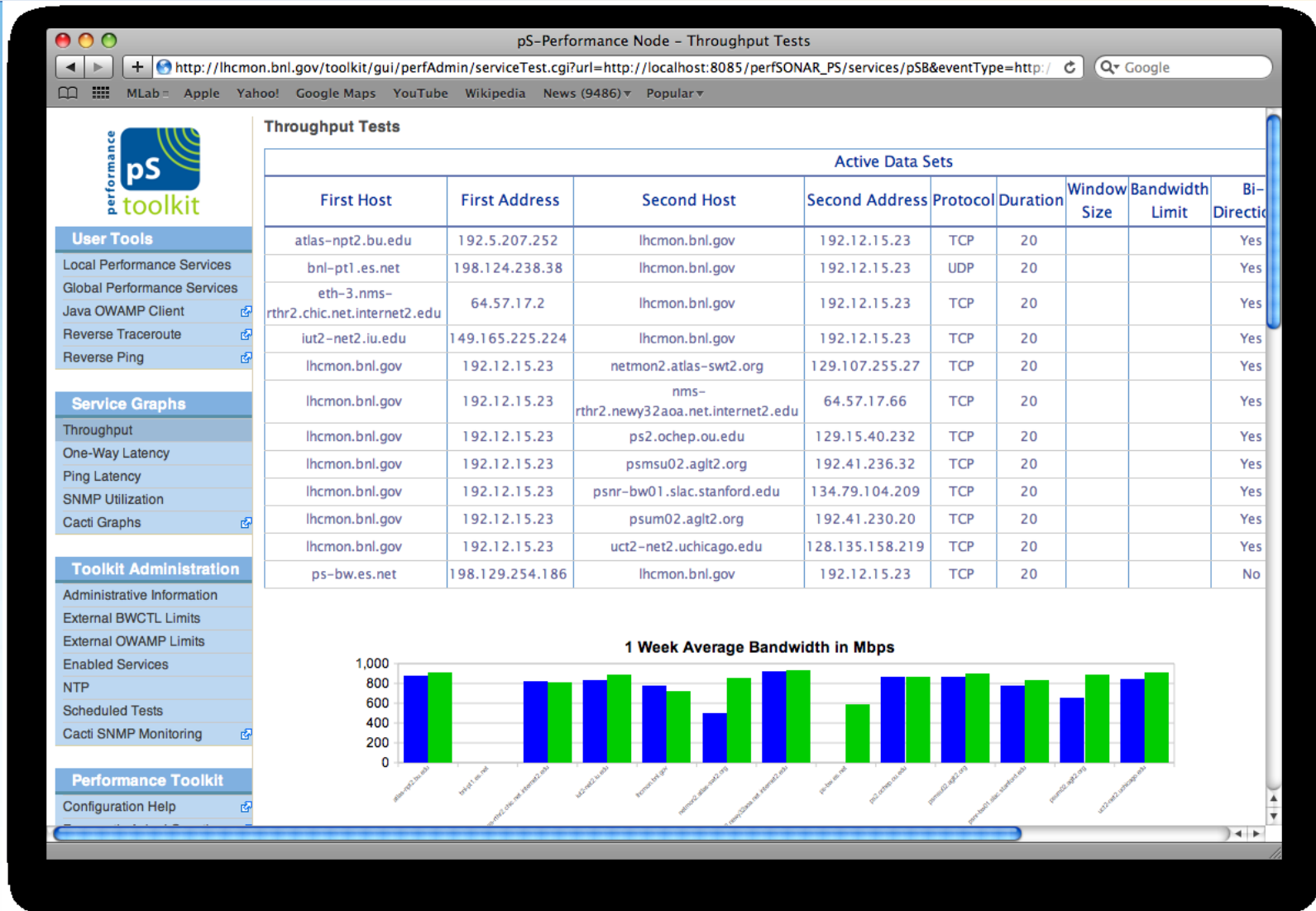
USATLAS – Simple Graph
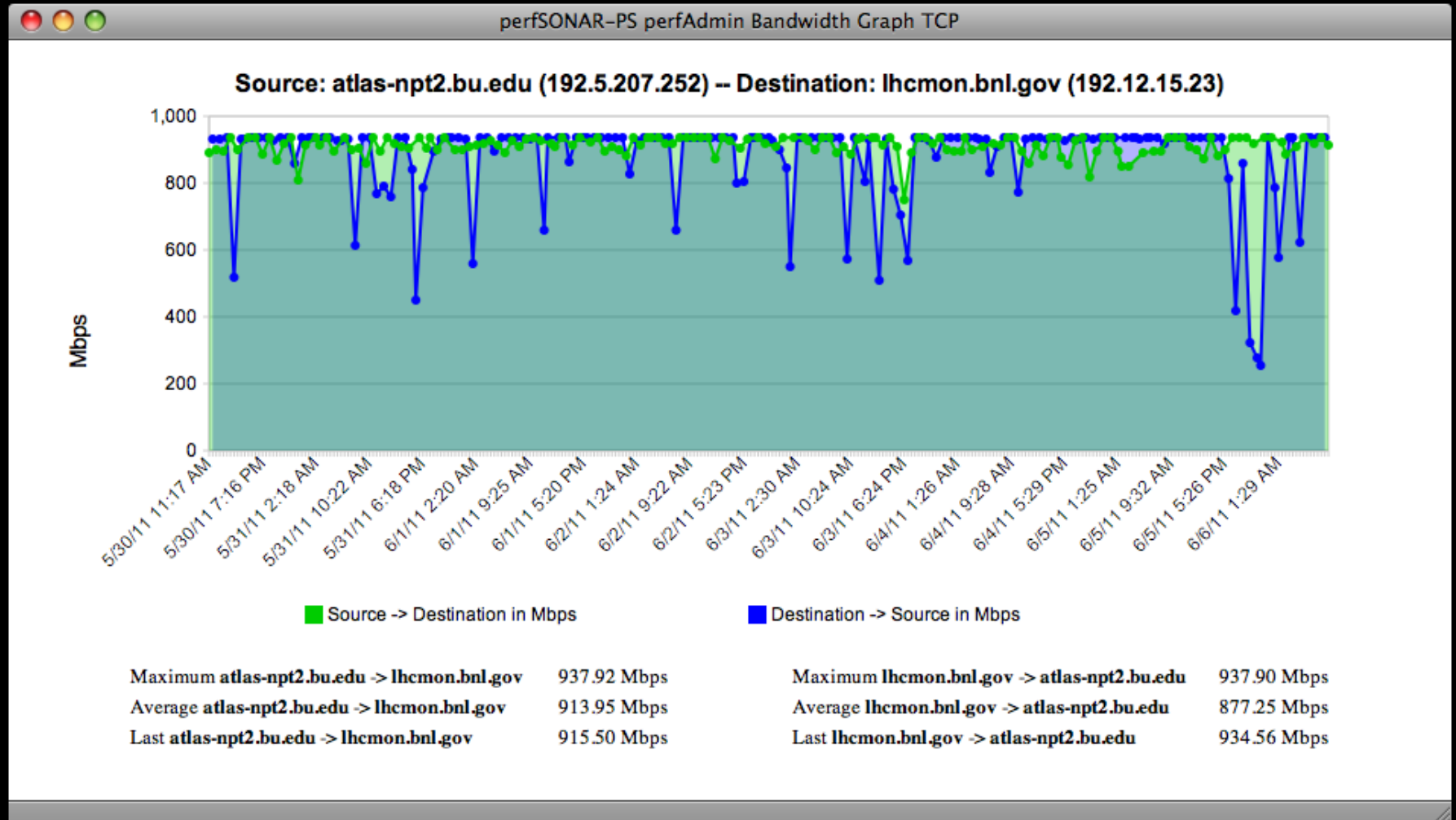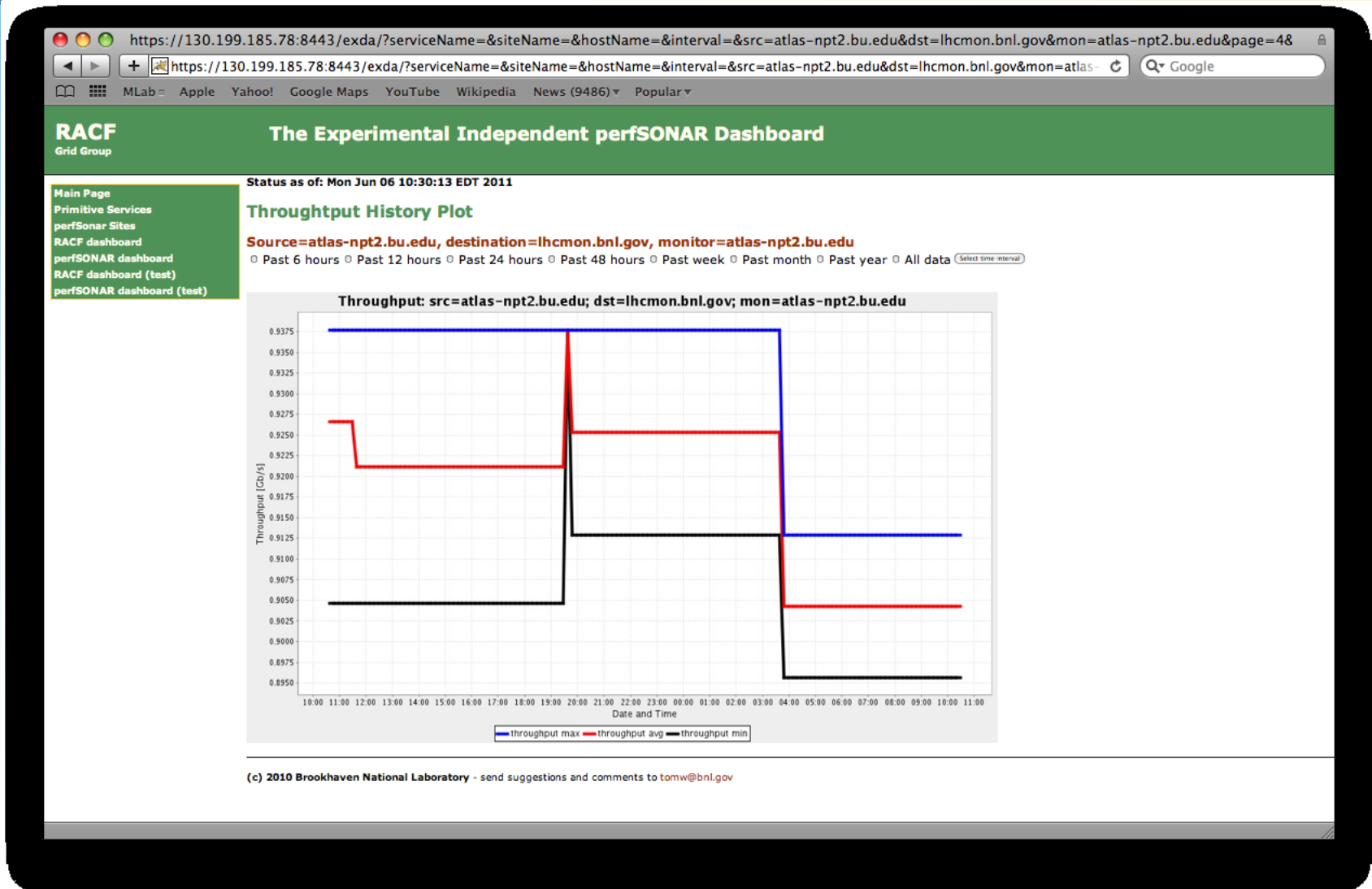
USATLAS

- Implementing other Components
  - Dashboard
    - Python based, integrated with perfSONAR-PS NAGIOS probes.
    - Web Service calls to remote instances to gain status info
    - Developed by BNL for USATLAS
  - Integration into data movement software
    - Still in pipe-dream phase – use perfSONAR-PS APIs to get data from monitoring hosts
    - Intelligent decisions about data movement (e.g. who to download from ala bit-torrent, or when to start a dynamic circuit vs use IP)

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USATLAS – "Complete" View
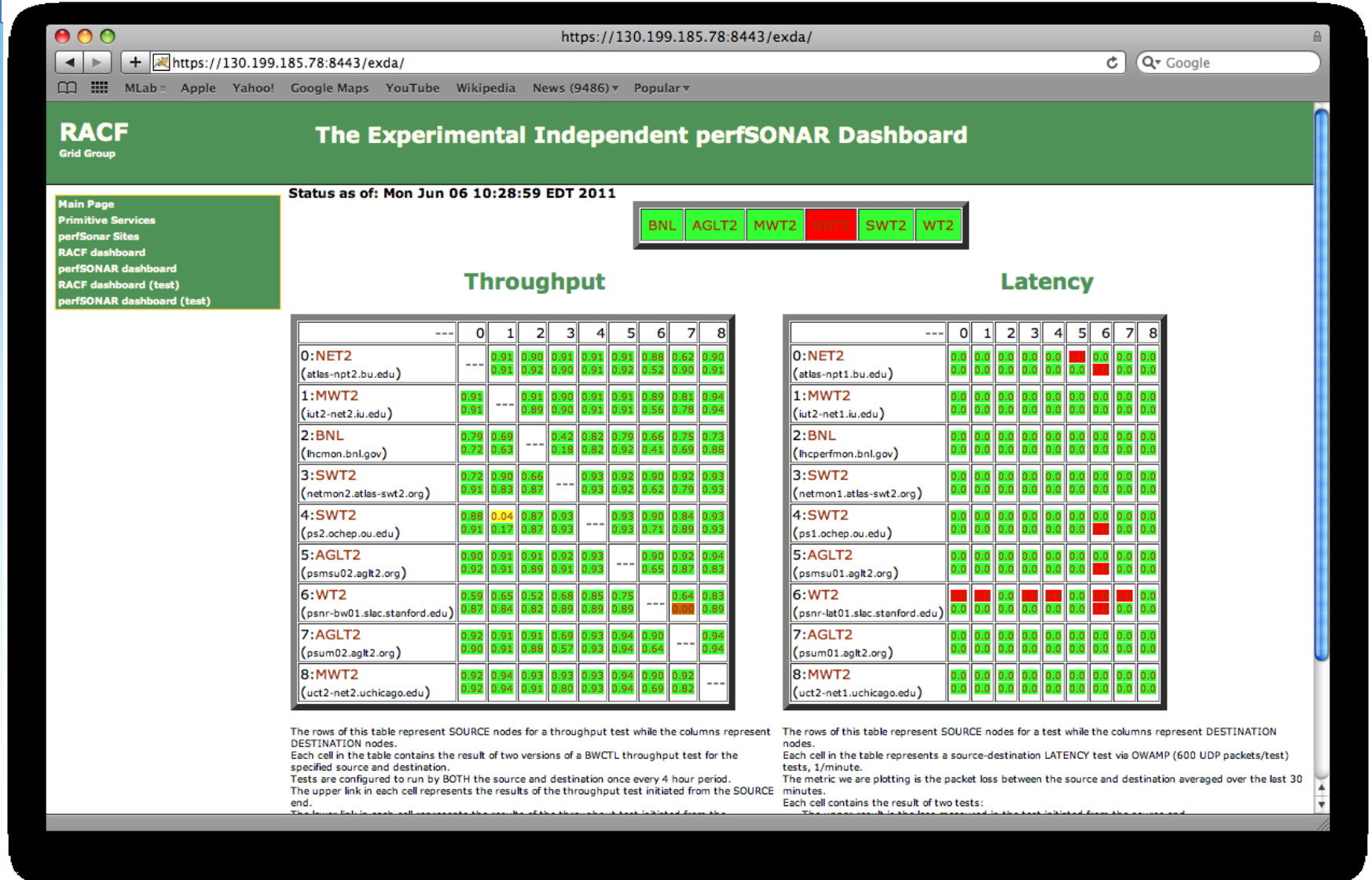
USATLAS – Per-Pair Performance

USATLAS

- Support Structure
  - "Open Source" Software = "Open Source" support.
  - Community mailing lists, meetings with pS PS engineers for debugging/feature requests
  - Support on installation/upgrading (2 or so times a year) as required
  - No PERT – performance problems are handled by USATLAS with the help of Internet2/ESnet typically organizing testing and resource coordination with peer networks
- Difference vs MDM
  - No Help Desk
  - Machines are under local control only (we don't maintain persistent login access)
  - Testing is up to the VO, we can help get things started.

INTERNET 2

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Potential Solutions

- Similar to USATLAS Approach
  - Mandate direct participants purchase at least 1 (preferable 2) machines for monitoring purposes.
    - Stationed at the network core (near the storage/processing equipment)
    - Bonus deployment at the edge
  - Encourage Backbone/Regional/XP operators to do the same. Harder to enforce outside of the VO…
  - Compile list of desirable functionality (e.g. regular testing, on demand testing, complete OS vs packages, etc.).
    - Market based study of what is available vs what could be developed.
  - Form (or use this) WG to serve as community support
    - Installation
    - Configuration
    - Trouble shooting

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Potential Solutions

- **Possible Enhancements**
  - New Software Development
    - LHC Community is not afraid to innovate – do the current solutions in the monitoring space scale? Is anything new needed? Anything need to be changed?
  - PERT/Help Desk
    - Home for the homeless w/ regards to trouble tickets.
    - Work with the networking partners to track progress
    - Handle issues with installation/configuration in the event that the open source model is not sufficient
  - Non-Local Control of monitoring
    - Central authority to own/maintain the infrastructure instead of allowing domains to manage this role

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Discussion