October 11th 2011, USATLAS Facilities Meeting

Jason Zurawski, Internet2 Research Liaison

perfSONAR-PS Update

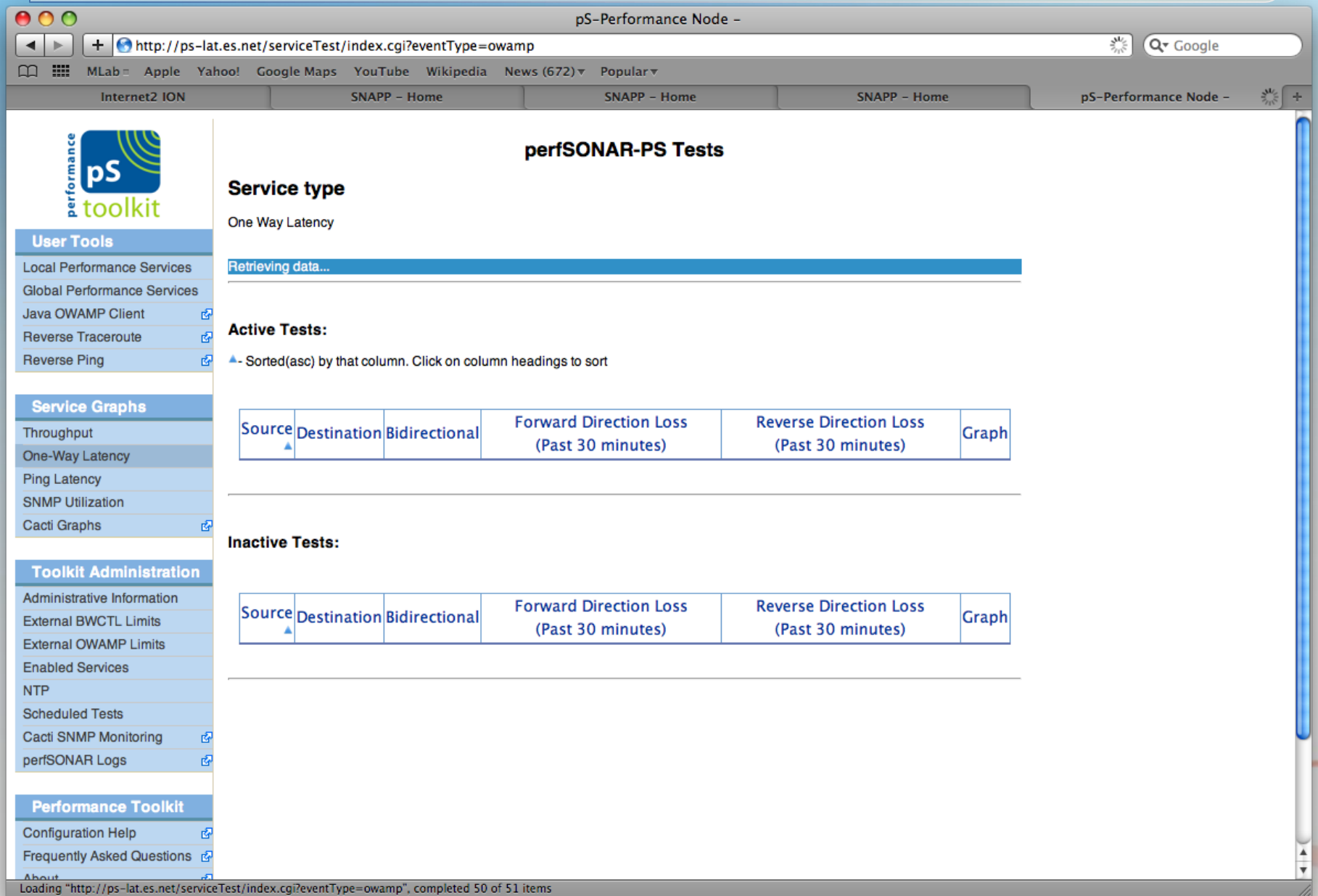
Agenda

- State of the Deployment
  - USATLAS
  - LHCOPN
  - Other Clouds (IT/CA/JP)
  - Non-Physics
- Some Performance Debugging
- 3.2.1 Release Status
- Discussion

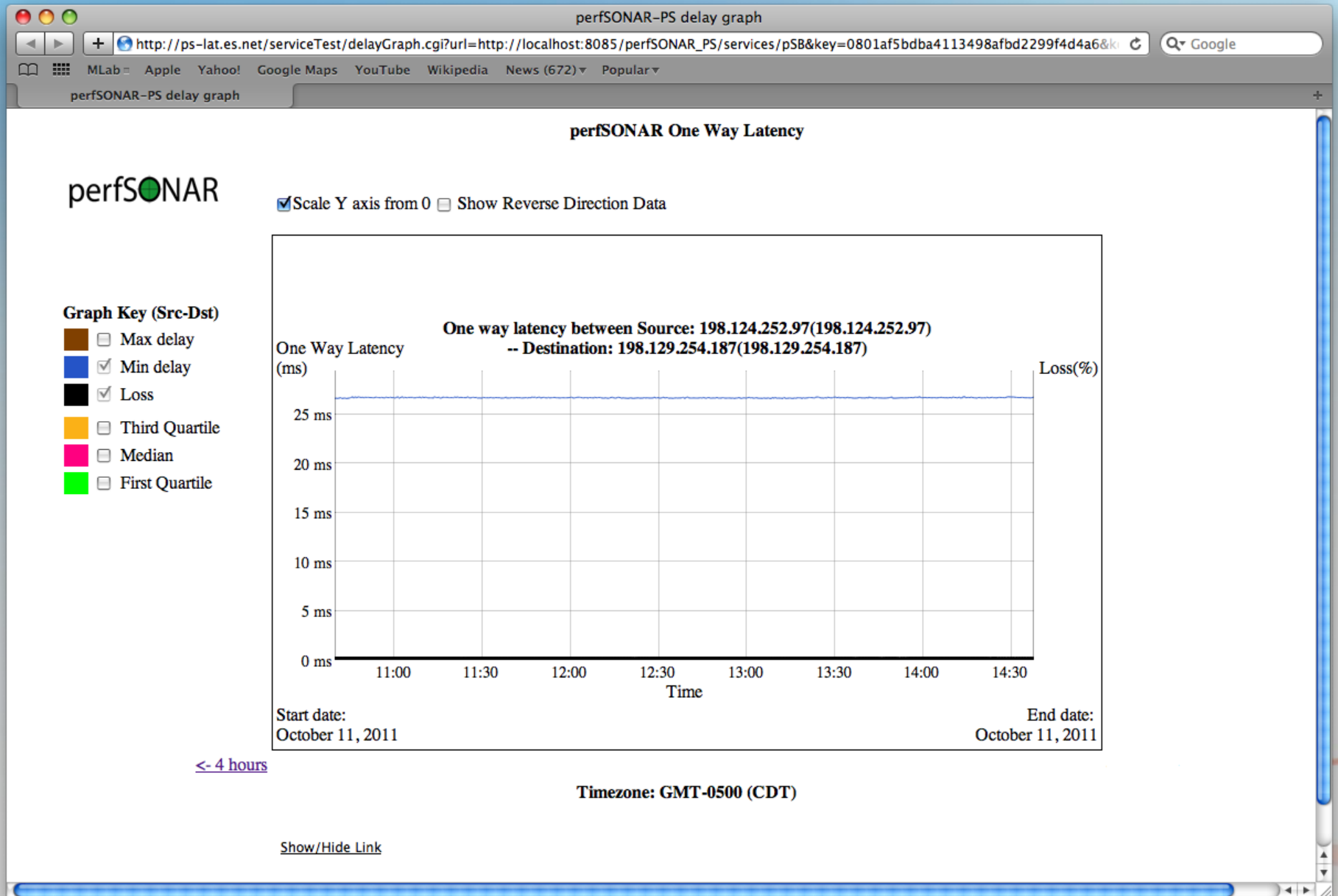
State of the Deployment

- Big Year for Deployments
  - LHC Community really ramping up use
    - Several ATLAS clouds
    - LHCOPN
    - CMS 'strongly considering' it ☺
  - Regional Networks in the US
  - Campuses
  - "Interoperability" with the MDM product
- Stability
  - Was not a great year for this, lots of bugs that sat around for a while
  - Developer time was very sparse, period between releases too long
- Extensions On The Way
  - Traceroutes
  - New GUIs (!)
  - Early support for 64 Bit
  - Circuit Monitoring (DYNES tie in)
- Wishlist(?)

New GUIs


pS-Performance Node –
http://ps-lat.es.net/serviceTest/index.cgi?eventType=owamp
Google
MLab
Apple
Yahoo!
Google Maps
YouTube
Wikipedia
News (672)
Popular
Internet2 ION
SNAPP – Home
SNAPP – Home
SNAPP – Home
pS-Performance Node –
performance pS toolkit
User Tools
Local Performance Services
Global Performance Services
Java OWAMP Client
Reverse Traceroute
Reverse Ping
Service Graphs
Throughput
One-Way Latency
Ping Latency
SNMP Utilization
Cacti Graphs
Toolkit Administration
Administrative Information
External BWCTL Limits
External OWAMP Limits
Enabled Services
NTP
Scheduled Tests
Cacti SNMP Monitoring
perfSONAR Logs
Performance Toolkit
Configuration Help
Frequently Asked Questions
perfSONAR-PS Tests
Service type
One Way Latency
Retrieving data...
Active Tests:
- Sorted(asc) by that column. Click on column headings to sort
Source
Destination
Bidirectional
Forward Direction Loss (Past 30 minutes)
Reverse Direction Loss (Past 30 minutes)
Graph
Inactive Tests:
Source
Destination
Bidirectional
Forward Direction Loss (Past 30 minutes)
Reverse Direction Loss (Past 30 minutes)
Graph
Loading "http://ps-lat.es.net/serviceTest/index.cgi?eventType=owamp", completed 50 of 51 items

New GUIs


perfSONAR-PS delay graph
http://ps-lat.es.net/serviceTest/delayGraph.cgi?url=http://localhost:8085/perfSONAR_PS/services/pSB&key=0801af5bdba4113498afbd2299f4d4a6&
Google
MLab
Apple
Yahoo!
Google Maps
YouTube
Wikipedia
News (672)
Popular
perfSONAR-PS delay graph
perfSONAR One Way Latency
perfSONAR
Scale Y axis from 0
Show Reverse Direction Data
Graph Key (Src-Dst)
Max delay
Min delay
Loss
Third Quartile
Median
First Quartile
One way latency between Source: 198.124.252.97(198.124.252.97)
-- Destination: 198.129.254.187(198.129.254.187)
One Way Latency
(ms)
Loss(%)
25 ms
20 ms
15 ms
10 ms
5 ms
0 ms
11:00
11:30
12:00
12:30
13:00
13:30
14:00
14:30
Time
Start date:
October 11, 2011
End date:
October 11, 2011
<- 4 hours
Timezone: GMT-0500 (CDT)
Show/Hide Link

State of the Deployment - USATLAS

- All sites still up
  - See Dashboard for more information:
- Known Issues
  - Mostly known bugs
  - Some problems at SLAC from time to time (not a 'true' pSPT)
  - BNL is dealing with some overuse (e.g. through the LHCOPN). Working ways to stabilize the host
- Hardware Refresh?
  - KOIs are now 4 years old
  - Shawn experimenting with R310s, and a 10G card

State of the Deployment - USATLAS

BNL | AGLT2 | MWT2 | NET2 | SWT2 | WT2

US cloud throughput measurement

---	0	1	2	3	4	5	6	7	8
0:BNL (lhcmon.bnl.gov)	--- ---	0.91 0.92	0.86 0.92	0.90 0.90	0.91 0.86	0.85 0.87	0.89 0.89	0.51 0.51	0.86 0.00
1:AGLT2 (psmsu02.aglt2.org)	0.92 0.88	--- ---	0.94 0.94	0.91 0.91	0.94 0.94	0.89 0.00	0.93 0.93	0.92 0.90	0.90 0.00
2:AGLT2 (psum02.aglt2.org)	0.92 0.91	0.63 0.94	--- ---	0.00 0.91	0.94 0.94	0.00 0.80	0.00 0.92	0.00 0.92	0.00 0.00
3:MWT2 (iut2-net2.iu.edu)	0.92 0.89	0.91 0.91	0.86 0.00	--- ---	0.94 0.94	0.69 0.62	0.90 0.90	0.90 0.89	0.89 0.00
4:MWT2 (uct2-net2.uchicago.edu)	0.93 0.92	0.93 0.94	0.93 0.93	0.94 0.94	--- ---	0.85 0.68	0.93 0.93	0.85 0.86	0.90 0.00
5:NET2 (atlas-npt2.bu.edu)	0.68 0.63	0.52 0.43	0.64 0.78	0.91 0.91	0.93 0.85	--- ---	0.91 0.74	0.68 0.50	0.64 0.00
6:SWT2 (ps2.ochep.ou.edu)	0.91 0.90	0.93 0.93	0.82 0.92	0.91 0.91	0.93 0.93	0.88 0.40	--- ---	0.93 0.93	0.90 0.00
7:SWT2 (netmon2.atlas-swt2.org)	0.90 0.90	0.92 0.92	0.92 0.92	0.90 0.90	0.68 0.93	0.80 0.45	0.93 0.85	--- ---	0.89 0.00
8:WT2 (psnr-bw01.slac.stanford.edu)	0.00 0.86	0.00 0.88	0.00 0.86	0.00 0.88	0.00 0.89	0.00 0.82	0.00 0.90	0.00 0.89	--- ---

US cloud latency measurement

---	0	1	2	3	4	5	6	7	8
0:BNL (lhcperfmon.bnl.gov)	0.0 0.0	0.0 1.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1:AGLT2 (psmsu01.aglt2.org)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
2:AGLT2 (psum01.aglt2.org)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
3:MWT2 (iut2-net1.iu.edu)	1.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
4:MWT2 (uct2-net1.uchicago.edu)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
5:NET2 (atlas-npt1.bu.edu)	0.0 2.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
6:SWT2 (ps1.ochep.ou.edu)	1.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
7:SWT2 (netmon1.atlas-swt2.org)	1.0 1.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
8:WT2 (psnr-lat01.slac.stanford.edu)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	1.0 0.0	0.0 0.0	0.0 0.0

State of the Deployment - LHCOPN

- All sites ‘up’, but working through several problems
  - See Dashboard for more information:
- Known Issues
  - RAL using VMs
  - Triumph/PIC/IN2P3 using a single host
  - BW Tests not Configured “long” Enough
  - Routing still a bit of an issue
    - Only reachable via the OPN
    - Ensuring that we are testing the ‘proper’ links
  - How to allow “cloud” members in the region to test?
- Hardware Choice?
  - Using demo stuff, may use the UMich recommendations when they are complete

State of the Deployment - LHCOPN

Sites of LHCOPN cloud

BNL	CNAF	CC-IN2P3	CERN	SARA	ASGC
NDGF	PIC	KIT	TRIUMF	RAL	FNAL

LHCOPN Cloud Throughput Matrix

---	0	1	2	3	4	5	6	7	8	9	10	11
0:BNL (lhcmon.bnl.gov)	--- ---	0.53 0.64	0.84 0.85	0.79 0.73	0.06 0.15	0.81 0.83	0.76 0.78	0.79 0.82	0.66 0.58	0.02 0.00	0.76 0.75	0.64 0.66
1:ASGC (perfsonar-ps.twgrid.org)	0.64 0.54	--- ---	0.44 0.49	0.52 0.52	0.37 0.20	0.71 0.71	0.50 0.50	0.49 0.49	0.42 0.44	0.01 0.02	0.53 0.53	0.03 0.03
2:CC-IN2P3 (ccperfsonar-lhcopn.in2p3.fr)	0.26 0.50	0.03 0.03	--- ---	0.93 0.94	0.03 0.03	0.08 0.05	0.87 0.77	0.73 0.70	0.52 0.48	0.07 0.00	0.82 0.78	0.98 0.47
3:CERN (perfsonar-ps.cern.ch)	0.74 0.78	0.50 0.50	0.94 0.82	--- ---	0.52 0.73	0.82 0.79	0.89 0.93	0.93 0.93	0.91 0.90	0.19 0.00	0.93 0.93	0.36 0.35
4:CNAF (perfsonar-ps.cnaf.infn.it)	0.46 0.15	0.21 0.31	0.27 0.22	0.43 0.43	--- ---	0.30 0.25	0.44 0.56	0.61 0.60	0.26 0.33	0.23 0.00	0.25 0.51	0.06 0.15
5:FNAL (psonar1.fnal.gov)	0.92 0.86	0.70 0.70	0.00 0.00	0.66 0.83	0.29 0.22	--- ---	0.33 0.80	0.77 0.00	0.72 0.62	0.01 0.00	0.00 0.00	0.02 0.01
6:KIT (perfsonar-de-kit.gridka.de)	0.77 0.75	0.48 0.48	0.94 0.94	0.93 0.94	0.06 0.06	0.58 0.62	--- ---	0.92 0.92	0.74 0.91	0.11 0.00	0.93 0.93	0.29 0.58
7:NDGF (perfsonar-ps2.ndgf.org)	0.61 0.64	0.38 0.48	0.60 0.78	0.81 0.84	0.37 0.41	0.00 0.78	0.52 0.57	--- ---	0.75 0.68	0.10 0.00	0.72 0.85	0.29 0.29
8:PIC (perfsonar-ps.pic.es)	0.24 0.25	0.11 0.13	0.72 0.59	0.82 0.89	0.50 0.18	0.25 0.23	0.78 0.81	0.71 0.71	--- ---	0.18 0.00	0.76 0.79	0.17 0.23
9:RAL (perfsonar-ps01.gridpp.rl.ac.uk)	0.00 0.22	0.00 0.00	0.00 0.34	0.00 0.25	0.00 0.24	0.00 0.19	0.00 0.37	0.00 0.24	0.00 0.09	--- ---	0.00 0.37	0.00 0.04
10:SARA (ps.lhcopn-ps.sara.nl)	0.74 0.72	0.53 0.53	0.47 0.48	0.70 0.71	0.02 0.03	0.00 0.00	0.81 0.82	0.85 0.85	0.30 0.29	0.05 0.00	--- ---	0.53 0.60
11:TRIUMF (perfsonar-ps.lhcopn-mon.triumf.ca)	0.24 0.49	0.02 0.01	0.05 0.03	0.04 0.04	0.03 0.03	0.29 0.33	0.08 0.00	0.00 0.00	0.04 0.00	0.01 0.00	0.16 0.00	--- ---

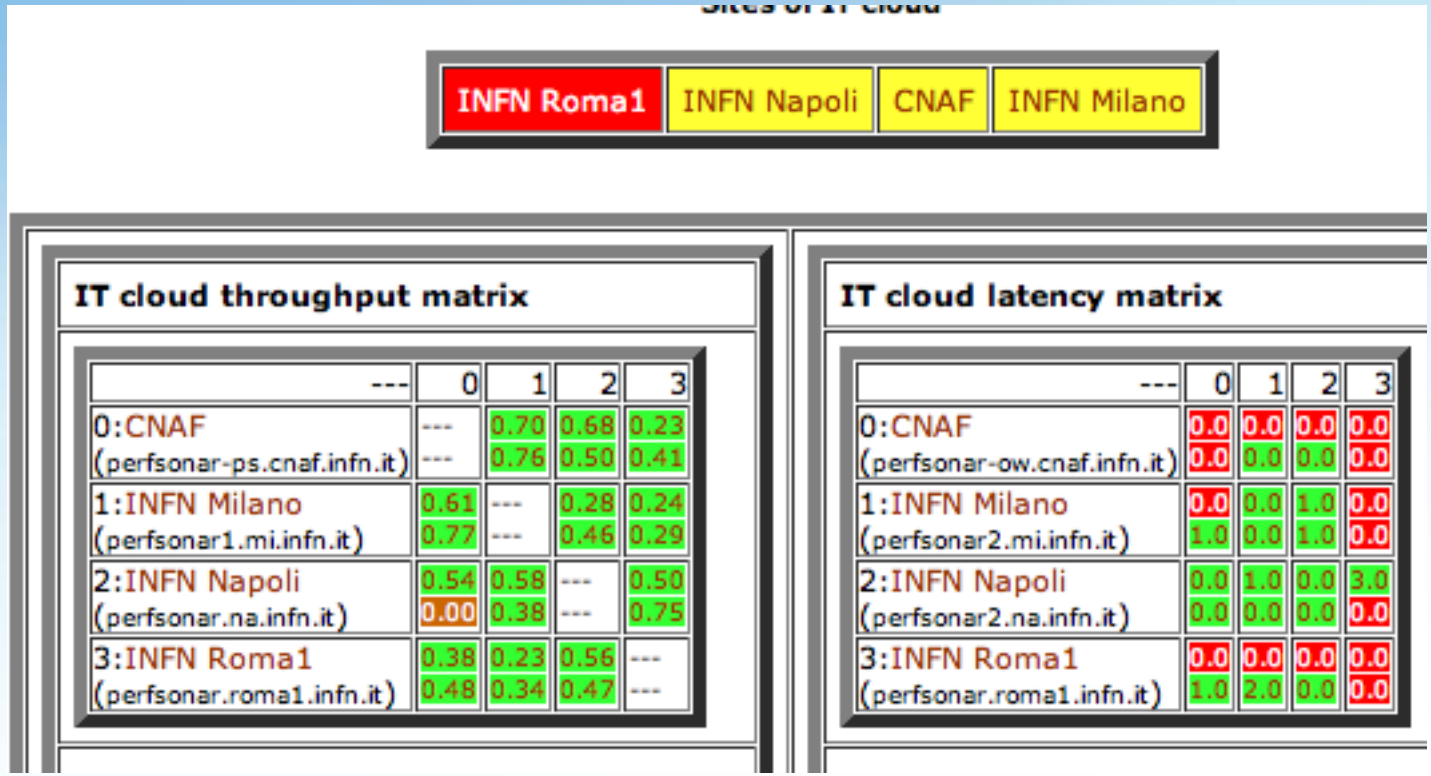
LHCOPN Cloud Latency Matrix

---	0	1	2	3	4	5	6	7	8	9	10	11
0:BNL (lhcperfmon.bnl.gov)	0.0 0.0	0.0 0.0	0.0 4.0	0.0 0.0	0.0 1.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	93.0 92.0	0.0 0.0	0.0 2.0
1:ASGC (perfsonar-ps.twgrid.org)	2.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	3.0 0.0	0.0 0.0	0.0 0.0	50.0 103.0	0.0 0.0	0.0 0.0
2:CC-IN2P3 (ccperfsonar-lhcopn.in2p3.fr)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	102.0 122.0	0.0 0.0	1.0 0.0
3:CERN (perfsonar-ps2.cern.ch)	0.0 0.0	0.0 0.0	6.0 3.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	112.0 127.0	1.0 1.0	1.0 1.0
4:CNAF (perfsonar-ow.cnaf.infn.it)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	90.0 36.0	1.0 0.0	0.0 0.0
5:FNAL (psonar2.fnal.gov)	1.0 1.0	0.0 0.0	3.0 600.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	104.0 106.0	0.0 0.0	7.0 9.0
6:KIT (perfsonar2-de-kit.gridka.de)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	107.0 121.0	0.0 0.0	1.0 1.0
7:NDGF (perfsonar-ps.ndgf.org)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	87.0 113.0	0.0 0.0	0.0 0.0
8:PIC (perfsonar-ps.pic.es)	0.0 0.0	0.0 0.0	3.0 4.0	0.0 0.0	0.0 1.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	150.0 101.0	0.0 0.0	0.0 1.0
9:RAL (perfsonar-ps02.gridpp.rl.ac.uk)	89.0 129.0	124.0 121.0	88.0 100.0	93.0 106.0	0.0 96.0	115.0 113.0	108.0 122.0	97.0 112.0	105.0 112.0	0.0 0.0	0.0 0.0	110.0 0.0
10:SARA (ps.lhcopn-ps.sara.nl)	0.0 0.0	3.0 4.0	1.0 2.0	1.0 3.0	0.0 1.0	0.0 0.0	2.0 2.0	0.0 0.0	3.0 1.0	0.0 0.0	0.0 0.0	1.0 2.0
11:TRIUMF (perfsonar-ps.lhcopn-mon.triumf.ca)	0.0 0.0	0.0 0.0	3.0 6.0	0.0 0.0	0.0 2.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0	0.0 112.0	0.0 0.0	0.0 0.0

State of the Deployment – Other Clouds

- Italian Cloud
  - Test deployment of some T1s and T2s
  - Good success so far, Tom W integrated them into the dashboard
  - Will be using 'real' hardware
- Canadian Cloud
  - Ian Gable purchased machines for each site in Canada.
  - Will integrate into Dashboard, deployment expected by the end of the year
- Japanese Cloud
  - Deploying in similar ways to the others. Still early in the process
- Others?
  - Others are welcome … but …
  - How do we scale the dashboard?
  - How does the support scale (e.g. pSPS Project can answer some questions, but with this many ATLAS specific sites it may make sense to form an ATLAS support group)

State of the Deployment – Other Clouds



INFN Roma1 | INFN Napoli | CNAF | INFN Milano

IT cloud throughput matrix

---	0	1	2	3
0:CNAF (perfsonar-ps.cnaf.infn.it)	--- ---	0.70 0.76	0.68 0.50	0.23 0.41
1:INFN Milano (perfsonar1.mi.infn.it)	0.61 0.77	--- ---	0.28 0.46	0.24 0.29
2:INFN Napoli (perfsonar.na.infn.it)	0.54 0.00	0.58 0.38	--- ---	0.50 0.75
3:INFN Roma1 (perfsonar.roma1.infn.it)	0.38 0.48	0.23 0.34	0.56 0.47	--- ---

IT cloud latency matrix

---	0	1	2	3
0:CNAF (perfsonar-ow.cnaf.infn.it)	0.0 0.0	0.0 0.0	0.0 0.0	0.0 0.0
1:INFN Milano (perfsonar2.mi.infn.it)	0.0 1.0	0.0 0.0	1.0 1.0	0.0 0.0
2:INFN Napoli (perfsonar2.na.infn.it)	0.0 0.0	1.0 0.0	0.0 0.0	3.0 0.0
3:INFN Roma1 (perfsonar.roma1.infn.it)	0.0 1.0	0.0 2.0	0.0 0.0	0.0 0.0

State of the Deployment – Non-Physics

- Projects
  - GENI
  - XSEDE
- Regional Networks
  - KANren performed a full deployment
  - GNP/MOREnet (and lots of others) have instances available
- International Links
  - IRNC project mandates OSCARS/perfSONAR on all links
  - TransPAC3, ACE, AMLIGHT, GLORIAD, PACWAVE to name a few
- International Networks
  - RNP (Brazil) has been a long time supporter, as has GEANT.
  - Some work to 'unify' the deployments, and do interoperability testing.
  - Want to see a wider deployment "where the science is being done", e.g. if you are involved in LHC, your campus/regional/backbone need to be supporting pS/OSCARS

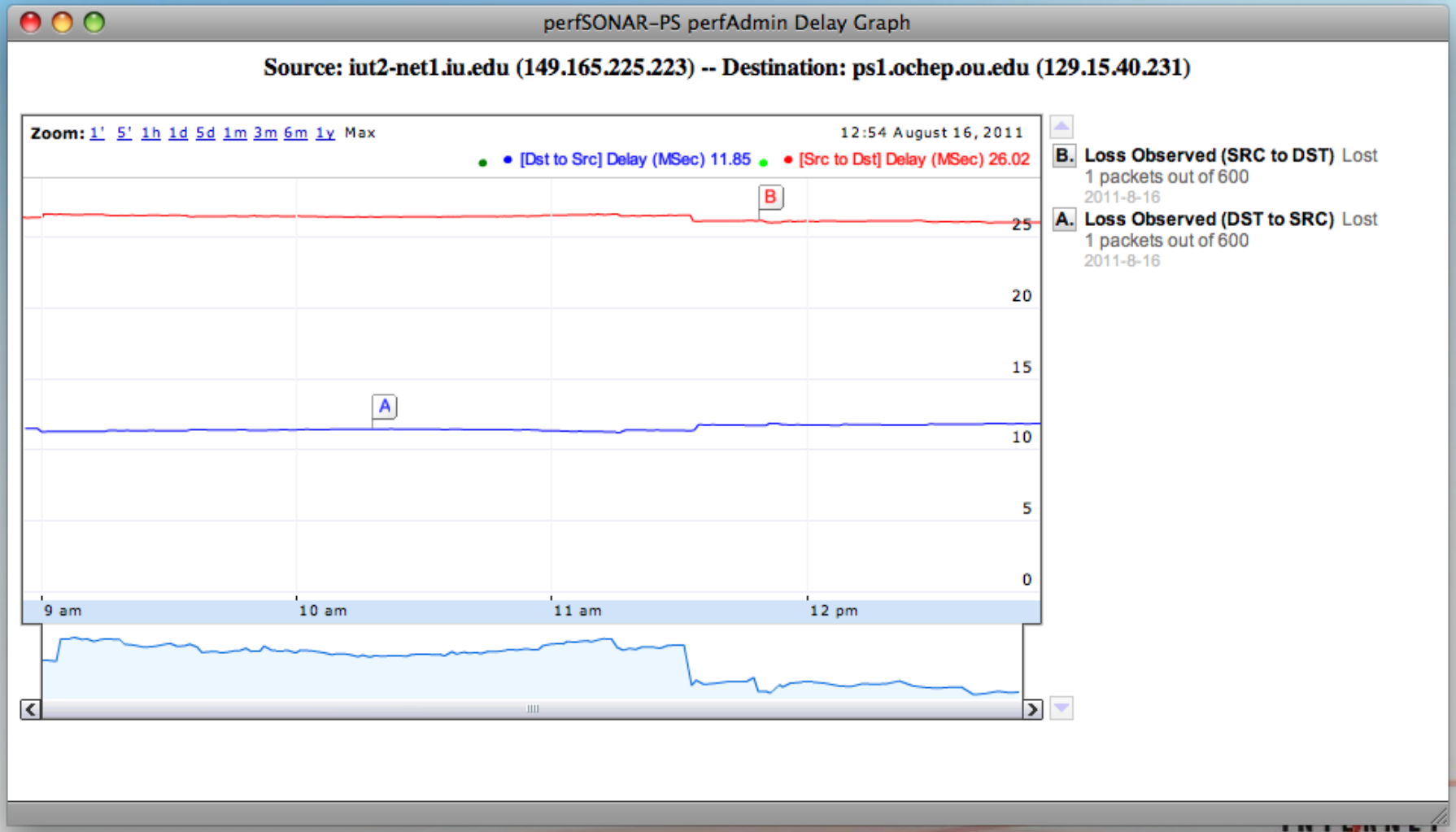
Agenda

- State of the Deployment
  - USATLAS
  - LHCOPN
  - Other Clouds (IT/CA/JP)
  - Non-Physics
- Some Performance Debugging
- 3.2.1 Release Status
- Discussion

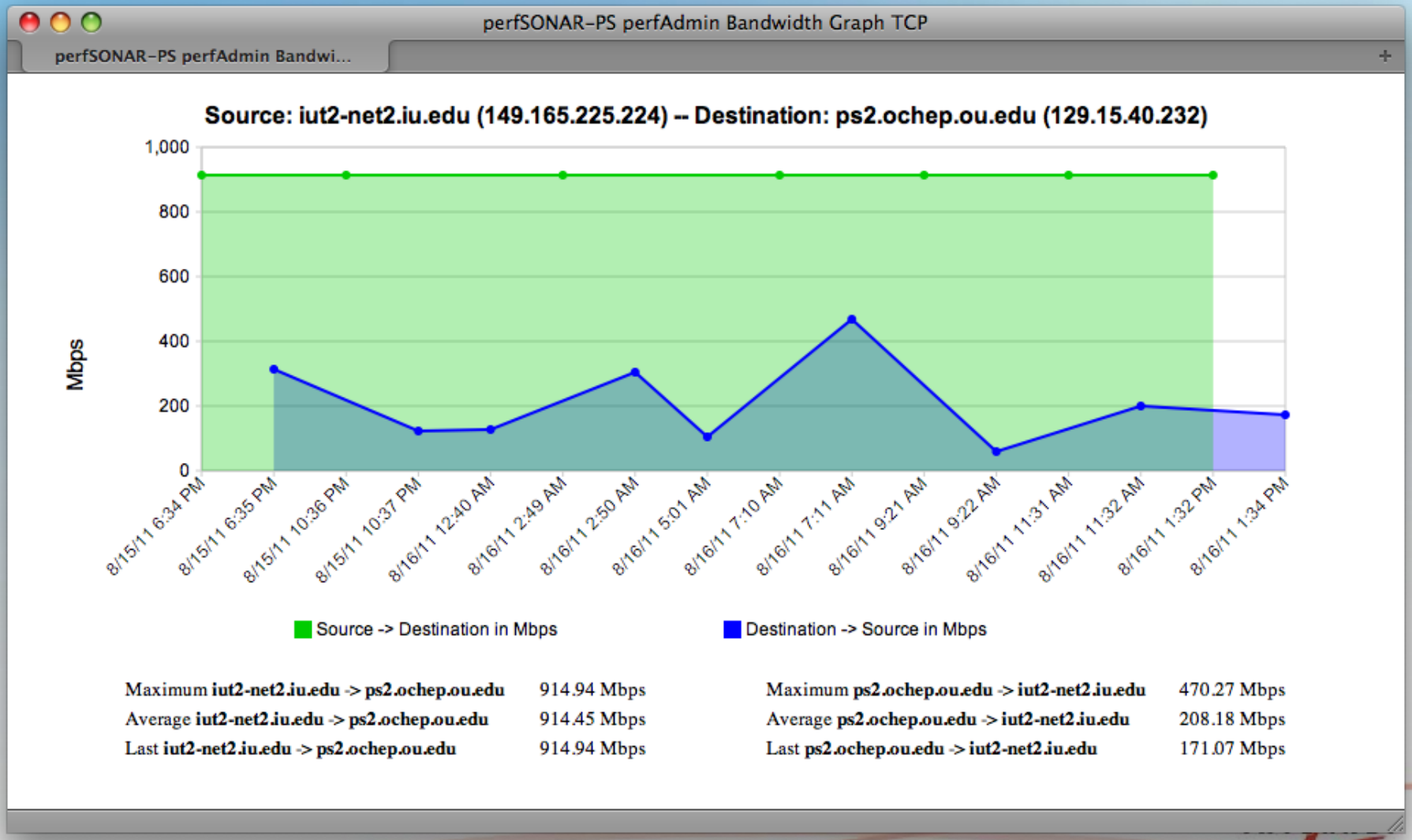
Performance Debugging

- 2 Recent ones:
  - UMich to CERN
  - OU/IU
- Both solved:
  - UMich to CERN was related to WAN Link configuration on USLHCnet. Isolated via pS instances at CERN, UMich, and places in the middle (e.g. BNL, USLHCnet testers)
  - OU/IU was in place for a long time. Asymmetric route where one side was worse than the other.
    - Some slides on this one…

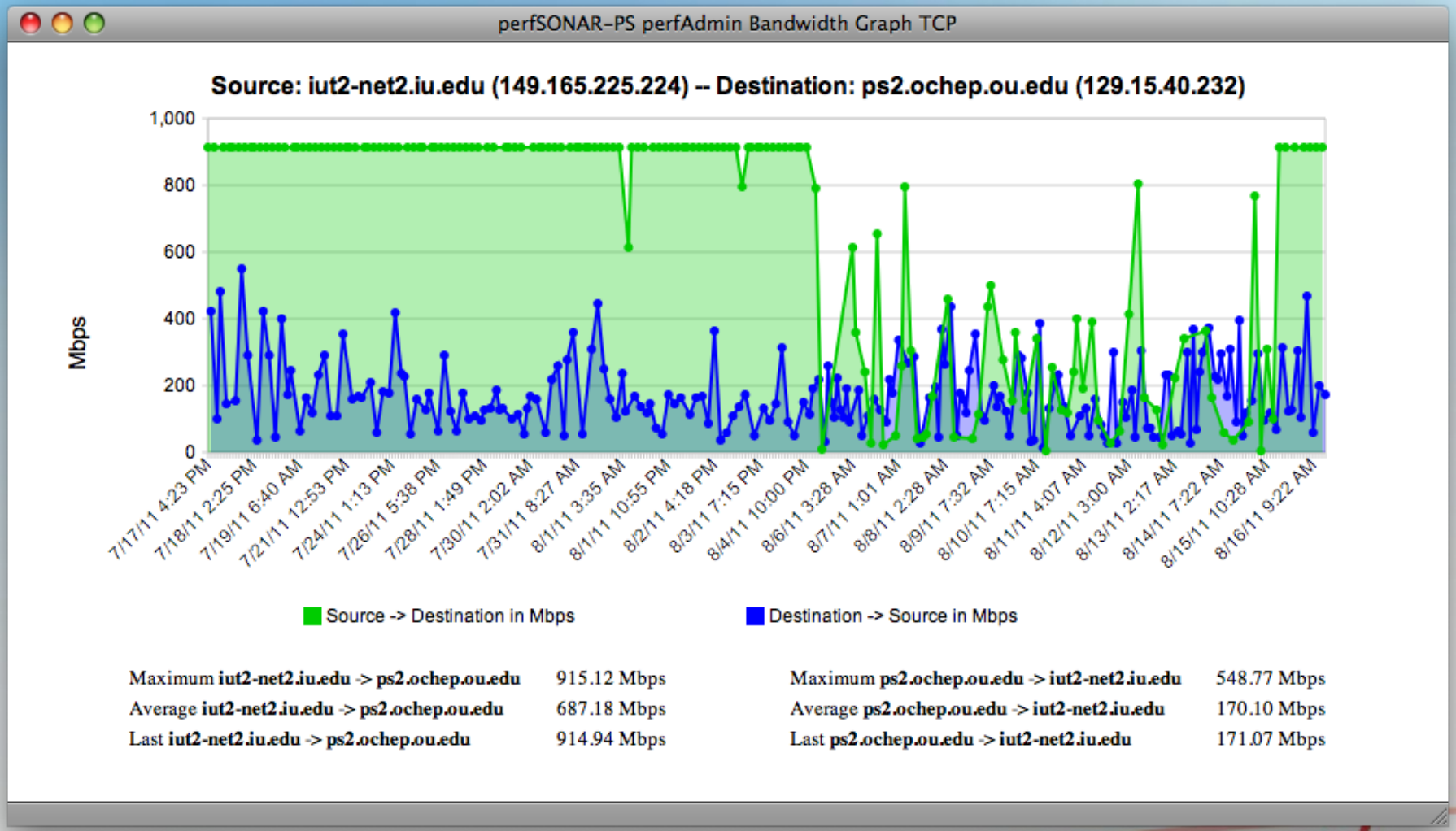
OU/IU – Latency Before



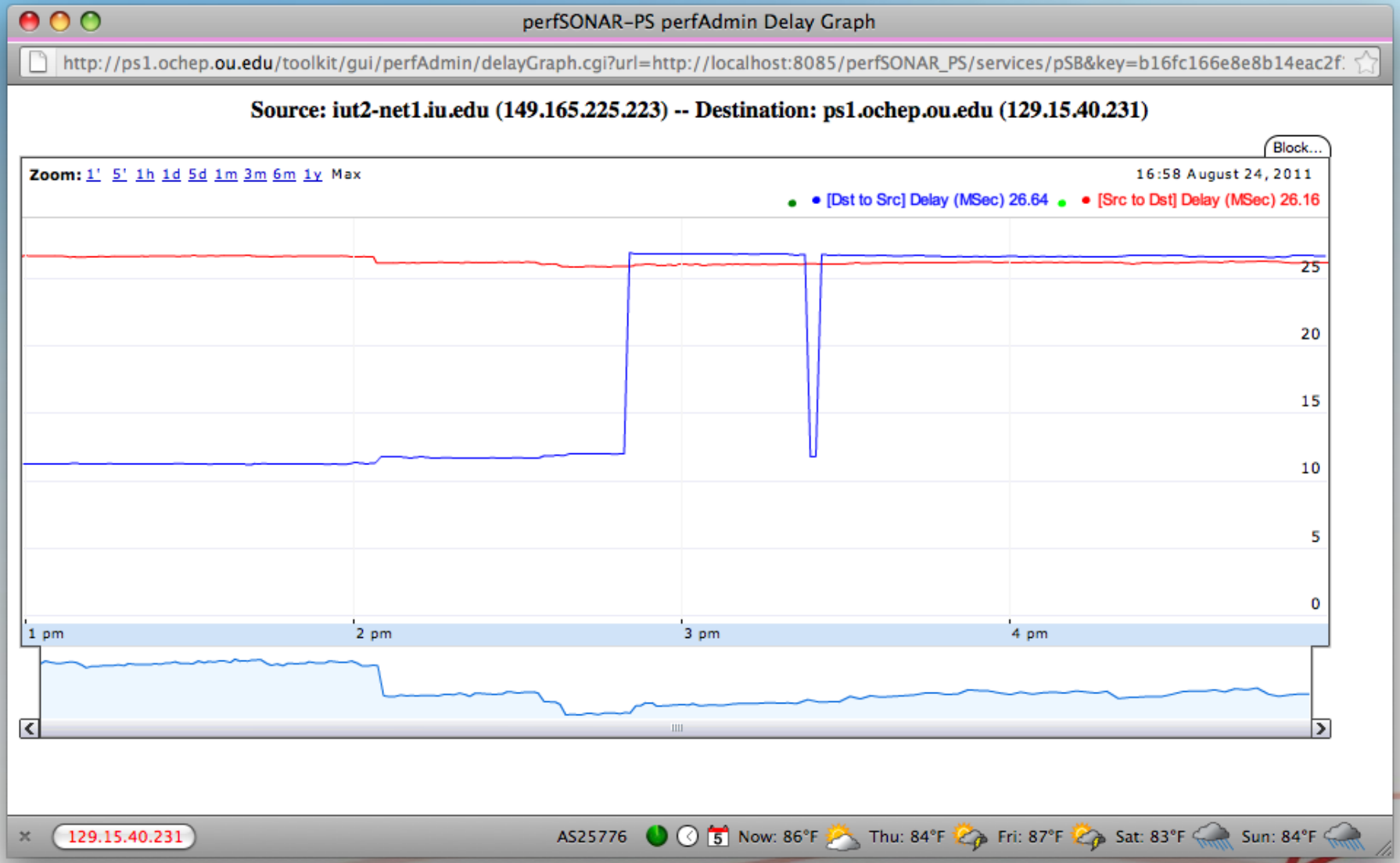
OU/IU – BW Before



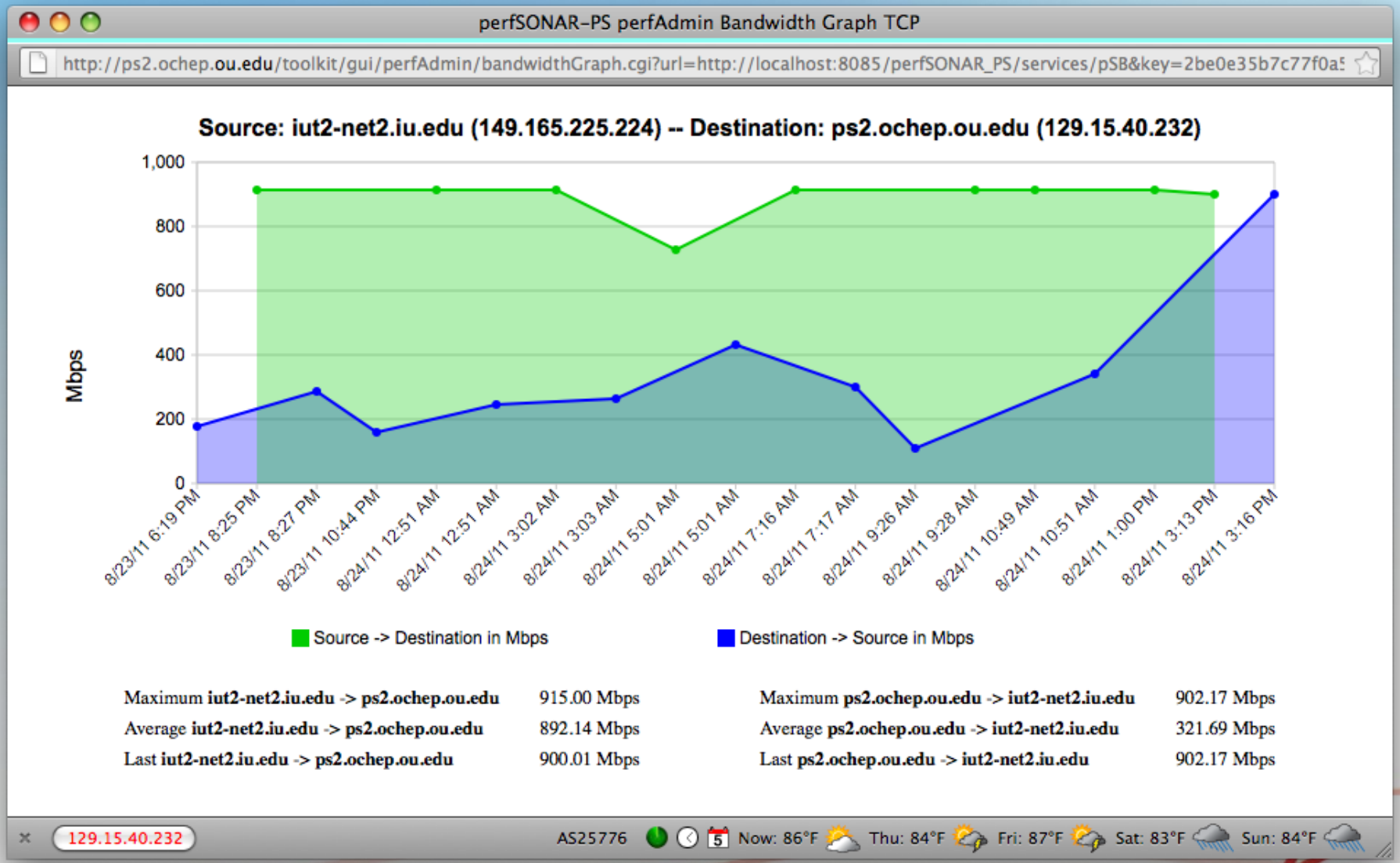
OU/IU – BW Before (Longer View)



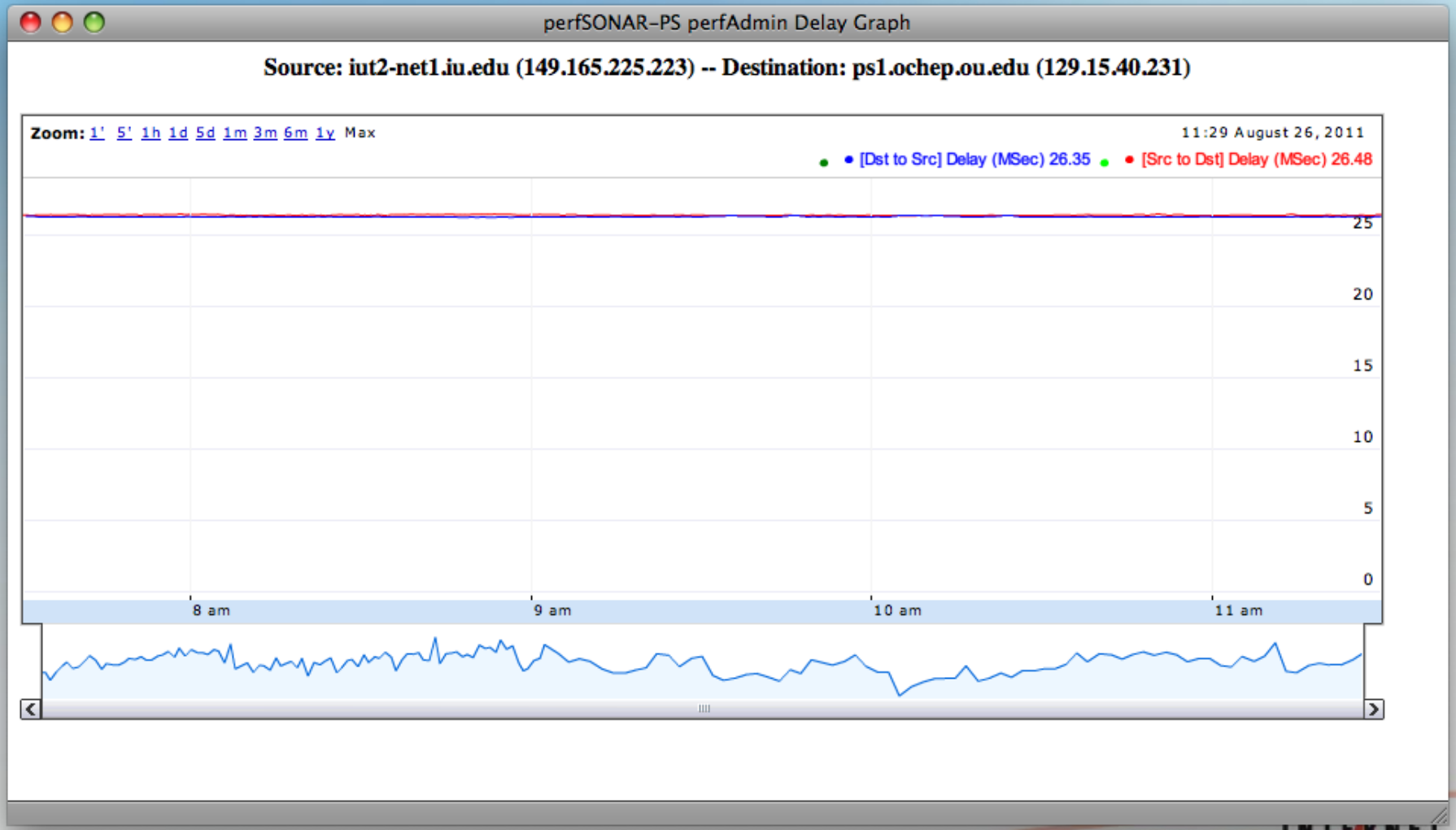
OU/IU – Latency After Routing Change



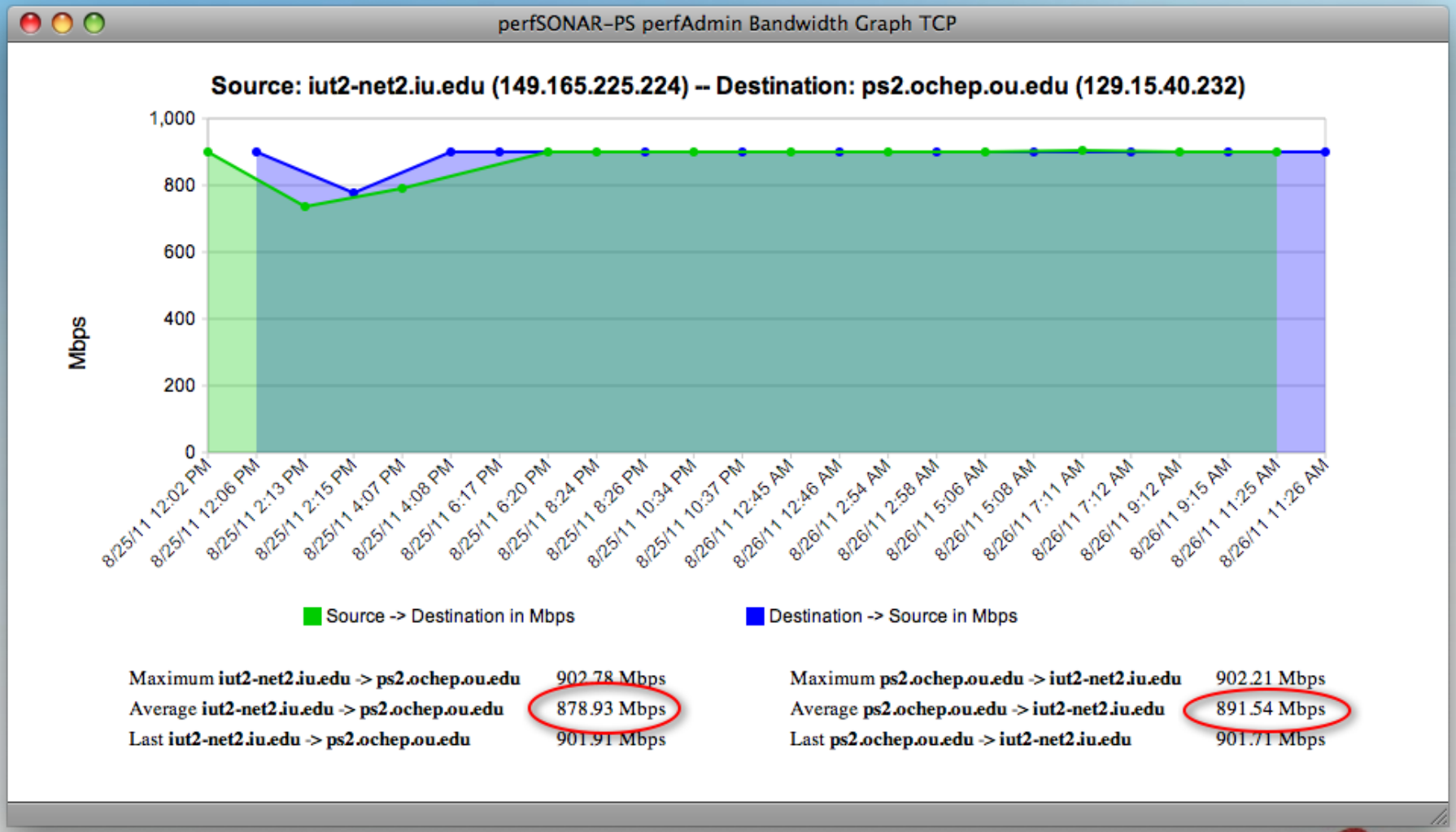
OU/IU – BW After Routing Change



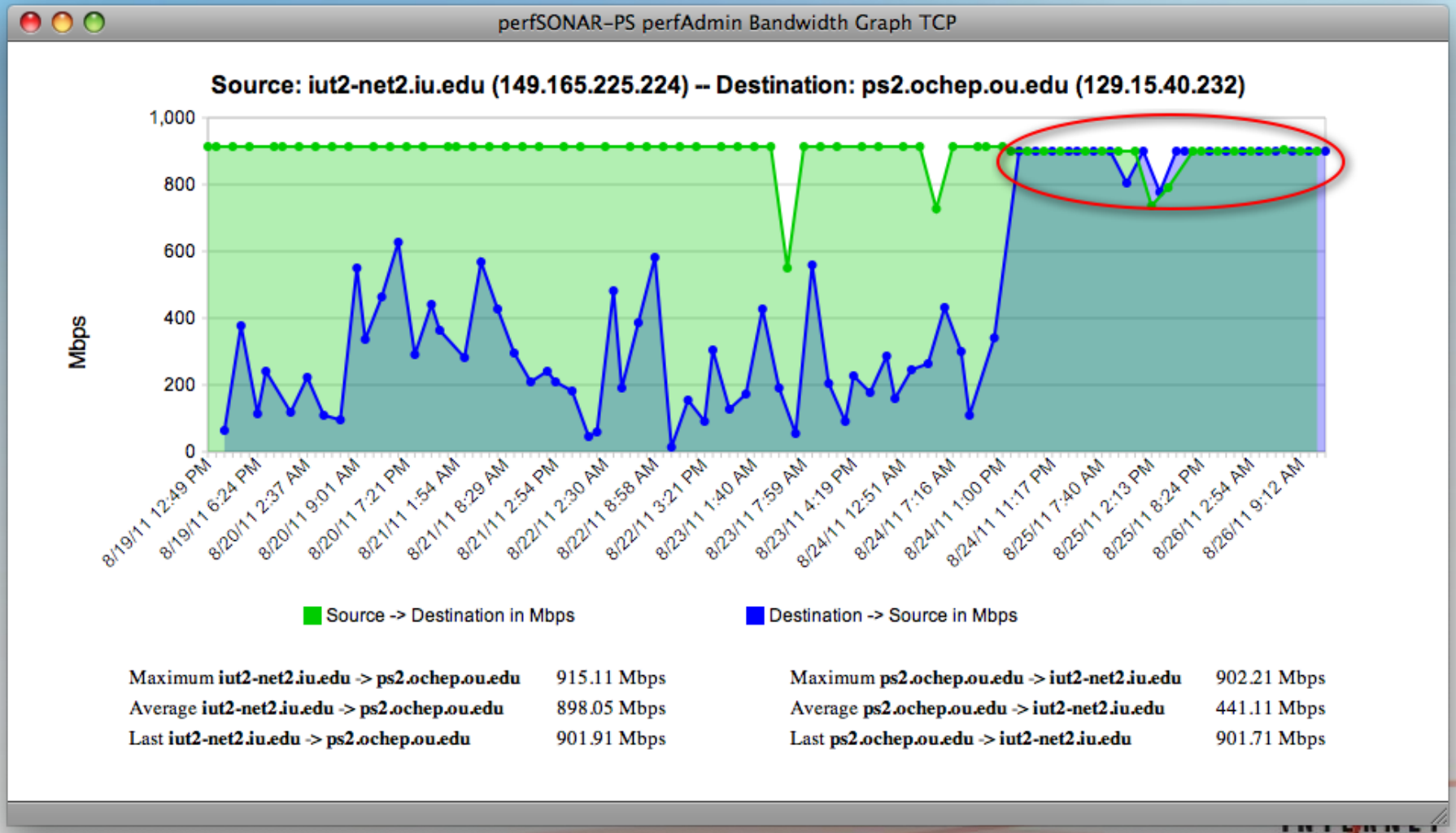
OU/IU – Latency One Week Later



OU/IU – BW One Week Later



OU/IU – BW One Week Later (Longer)



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  - USATLAS
  - LHCOPN
  - Other Clouds (IT/CA/JP)
  - Non-Physics
- Some Performance Debugging
- 3.2.1 Release Status
- Discussion

3.2.1 Release Status

- First Some News:
  - Aaron Brown (Internet2) and Andy Lake (ESnet) are leading the Release/Testing process for the 3.2.1 Release of the pSPT
  - Jason will be working with the Internet2 CTO (Steve Wolff) to better support Scientists and Researchers (e.g. all of you)
- Status:
  - RC3 Was out 2 weeks ago
    - Minor bugs/annoyances noted, nothing 'new' to report
    - Testers from ATLAS, and the US R&E Networking community
  - RC4 may be skipped in favor of release
- Bug List/New Features
  - http://psps.perfsonar.net/toolkit/releasenotes/pspt-3_2_1.html
  - Too many to enumerate on slides …

Agenda

- State of the Deployment
  - USATLAS
  - LHCOPN
  - Other Clouds (IT/CA/JP)
  - Non-Physics
- Some Performance Debugging
- 3.2.1 Release Status
- Discussion

Discussion

- What are we still missing in terms of software to support ATLAS (LHC)?
  - Analysis GUIs may be one area, although note we are migrating to some better software here
  - Emerging traceroute capabilities
  - NAGIOS Integration
  - What other metrics matter?
- Have we done any misteps in the past year that need to be corrected?
  - Release frequency was poor … unfortunately this may not get any better
  - Support for sites/bug fixes – did we get them all as timely as possible?
- What is the future?
  - More Clouds?
  - Support from pSPS? Support from ATLAS/LHC?

perfSONAR-PS Update

October 11th 2011, USATLAS Facilities Meeting

Jason Zurawski, Internet2 Research Liaison

For more information, visit http://psps.perfsonar.net/toolkit

