



# perfSONAR

## perfSONAR Update: Better monitoring = Better networks


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# perfSONAR

## perfSONAR Toolkit 3.5: What's Coming Next?



# Themes

- Support for central host management and node auto-configuration
- Support for low cost nodes
- Support for Debian, VMs, and other installation options
- Modernize the GUIs

## Timeline:

- rc1 in July:
- final release in September

# Expanded perfSONAR Use Cases

- Current Use Case
  - perfSONAR Toolkit
    - Includes CentOS 6 and all perfSONAR components
- New Use Cases
  - perfSONAR tools only
    - Support for both RHEL-based and Debian-based hosts
  - perfSONAR hosts that are centrally managed
  - perfSONAR hosts that ‘self-configure’
  - NDT only host

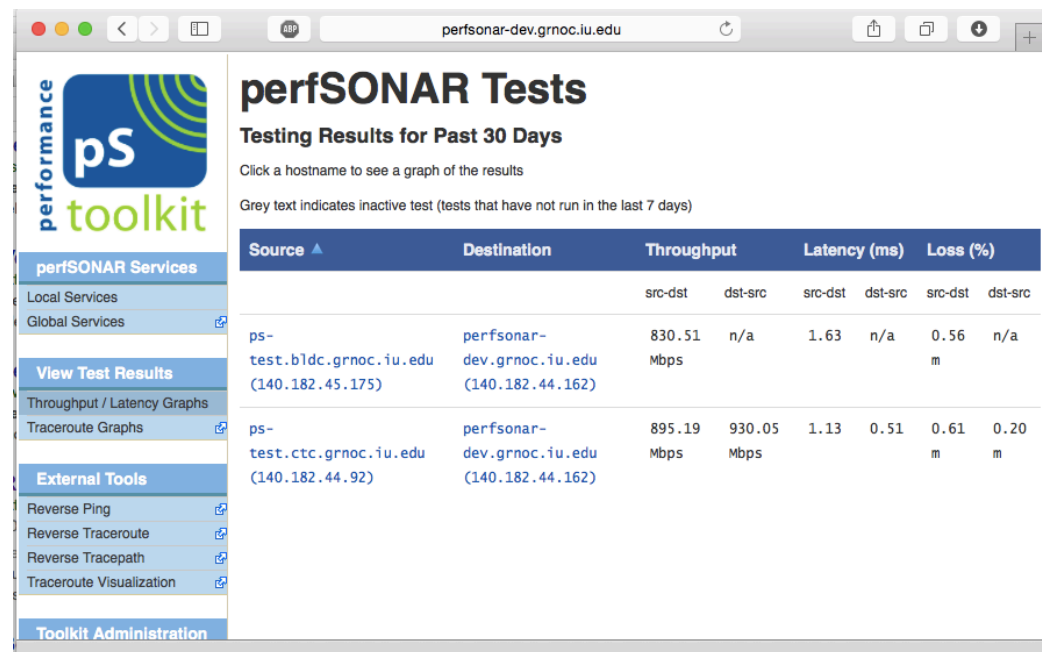
# Current perfSONAR components

- Measurement tools
  - iperf3, bwctl, owamp, traceroute, etc.
- Measurement archive
- Central test mesh management tools
- Host management tools
  - Configure tests, configure NTP, etc.
- Data analysis tools
  - Plot data from the archive
  - Dashboard tools
- Lookup Service

**Note: perfSONAR measurement tools are extremely useful for troubleshooting on their own.**

# User Interface Refresh

- The toolkit provides an easy to use web interface targeted at users at a variety of levels of technical expertise.
- We intend to refresh this UI in the 3.5 release to improve ease of use, visual appeal, and integration of state of the art UI components to extend UI lifespan.



The screenshot shows the perfSONAR Tests web interface. The browser address bar displays 'perfsonar-dev.grnoc.iu.edu'. The page title is 'perfSONAR Tests' and the subtitle is 'Testing Results for Past 30 Days'. Below the title, there is a note: 'Click a hostname to see a graph of the results' and 'Grey text indicates inactive test (tests that have not run in the last 7 days)'. The main content is a table with the following columns: Source, Destination, Throughput, Latency (ms), and Loss (%). The table contains two rows of test results.

| Source  | Destination                                    | Throughput     | Latency (ms)   | Loss (%)                   |
|---|--|----------------|----------------|----------------------------|
| ps-test.bldc.grnoc.iu.edu<br>(140.182.45.175) | perfsonar-dev.grnoc.iu.edu<br>(140.182.44.162) | 830.51<br>Mbps | n/a            | 1.63 n/a<br>0.56 m         |
| ps-test.ctc.grnoc.iu.edu<br>(140.182.44.92)   | perfsonar-dev.grnoc.iu.edu<br>(140.182.44.162) | 895.19<br>Mbps | 930.05<br>Mbps | 1.13 0.51<br>0.61 m 0.20 m |

# New Management Interface perfSONAR

perfSONAR

Configuration




Help

 **perfsonar-dev.grnoc.iu.edu** at 140.188.44.162 [Edit](#)


**Organization:** GlobalNOC

**Address:** Bloomington, IN 47401 (USA) [map](#)

**Administrator:** Michael Johnson [mj82@grnoc.iu.edu](mailto:mj82@grnoc.iu.edu)


 Normal  Virtual Machine (VM)  Small Node



## Services



Enable/disable services 

| SERVICE                 | STATUS      | VERSION  | PORTS      | SERVICE LOGS         |
|-------------------------|-------------|----------|------------|----------------------|
| <a href="#">BWCTL</a> ▾ | Running     | 1.5.2-10 | 4823       | <a href="#">View</a> |
| <a href="#">Esmond</a>  | Running     | 1.0-9    | 80         |                      |
| <a href="#">NDT</a> ▾   | Not running | 3.70-1   | 3001; 7123 | <a href="#">View</a> |
| <a href="#">NPAD</a>    | Running     | 1.5.6-3  | 8000       |                      |

## Test Results (18 Active tests)

Configure tests 

 One test is not running properly ([latency 1](#)) 

 One test is performing below threshold ([throughput 1](#)) 

 Two tests have packet loss ([latency 1](#), [latency 2](#))

| SOURCE   | DESTINATION                          | THROUGHPUT                                   | LATENCY (M)                                      | LOSS (%)   |
|--|--------------------------------------|--|--|--|
| perfsonar-dev-owamp.grnoc.iu.edu<br>(198.124.238.49)<br><a href="#">Details   Traceroute</a> | bnl-owamp.es.net<br>(140.182.44.125) | src-dest: <b>n/a</b><br>dest-src: <b>n/a</b> | src-dest: <b>18.74</b><br>dest-src: <b>17.16</b> | src-dest: <b>0.03m</b><br>dest-src: <b>3.14m</b> |

## Host status

|                 |                  |
|-----------------|------------------|
| CPU Usage       | 20%              |
| Load            | 1.59, 1.65, 1.63 |
| RAM             | <b>3.75/4 GB</b> |
| Root partition  | 24/40 GB         |
| Swap space      | 2/5 GB           |
| NTP             | Synced (5 ms)    |
| eth0            | 9000 MTU         |
| eth1            | 1500 MTU         |
| Auto Updates    | <b>ON</b>        |
| Number of Cores | 4                |
| OS/Kernel       | 1.23             |
| Node type       | NREN             |
| Access          | Public           |

## On-demand testing tools

[Reverse ping](#)

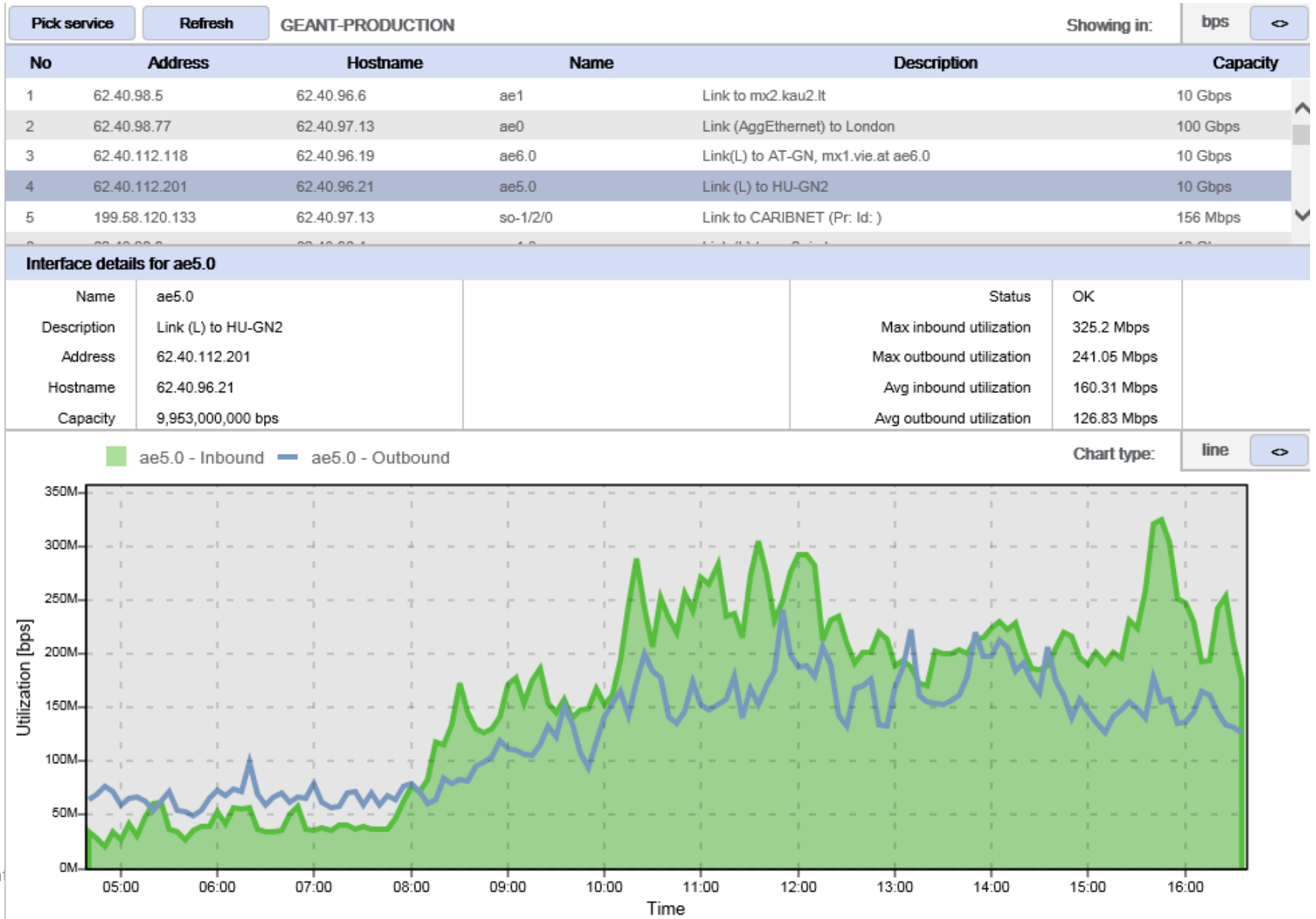
[Reverse traceroute](#)

[Reverse tracepath](#)

[Traceroute Visualization](#) 

## Other services

# Updated psUI from GEANT perfSONAR





# Improving Efficiency and Consistency

- perfSONAR is a very active project, with a continuous development cycle.
- We want to spend less time building and testing and more time developing cool new features while maintaining/enhancing quality of each release!
- Enable this by focusing on:
  - Automated build and release management systems
  - Continuous integration of code, including automated unit and system testing.

# Improved Support for Central Management

- Goals:
  - Make it easy to incorporate perfSONAR hosts into existing host management systems (puppet, chef, SaltStack, cfengine, etc.)
  - Make it easy to manage many perfSONAR hosts at a single institution
  - New rpm bundles to support this

# Test Node Auto-Configuration

- Goal: Support a perfSONAR node that will require zero configuration
- Site will register in the lookup service:
  - What hosts to run tests to
  - Where to send the test results
- Assumes DHCP to get node address
- Primary use case is for sites with several nodes

# BWCTL 2.0

- Goals
  - Easy to write new clients
  - Easy to add new tools
  - Support new features
    - Ability to “Pause” tests
    - Ability to set test priority (move my test to the head of the queue)
    - Work without NTP sync
    - Restrict testing by time interval
      - E.g.: only between 11pm and 6am
    - More fine-grained test limits
      - Per-user testing rate, per subnet test rate, etc.
  - Decrease the number of ports that need opened
  - Easier to read/modify codebase
  - Backward compatible with bwctl 1.x

# perfSONAR for Network Researchers

- Vast amount of active measurement of interest to network researchers
  - perfSONAR Toolkit automatically collects traceroute data along with bwctl/owamp results
- New tool makes it easy to download data from perfSONAR measurement archives for analysis
  - esmond-ps-get-bulk
    - Output CSV or JSON
    - See: [https://testpypi.python.org/pypi/esmond\\_client](https://testpypi.python.org/pypi/esmond_client)

# Low Cost Nodes

- Lots of effort in the community to operate perfSONAR services on low cost (\$100-\$200) hardware
- High level of interest in community for low-cost deployment options (wiring closets, network engineer's backpacks, "give-away" nodes, etc.)
- Want to provide a well supported and tested option for these users as part of pS-Toolkit
- More details in next talk.

## Also...

- Modernize NDT, including new UI
- Improve integration with NOC alarming systems
- Formal security review for all components

# Useful URLs

- <http://docs.perfsonar.net/>
- <https://www.perfsonar.net/>
- <http://fasterdata.es.net/>
  - <http://fasterdata.es.net/performance-testing/>  
[network-troubleshooting-tools/](http://fasterdata.es.net/network-troubleshooting-tools/)
- <https://github.com/perfsonar>
  - <https://github.com/perfsonar/project/wiki>