



Introduction to perfSONAR

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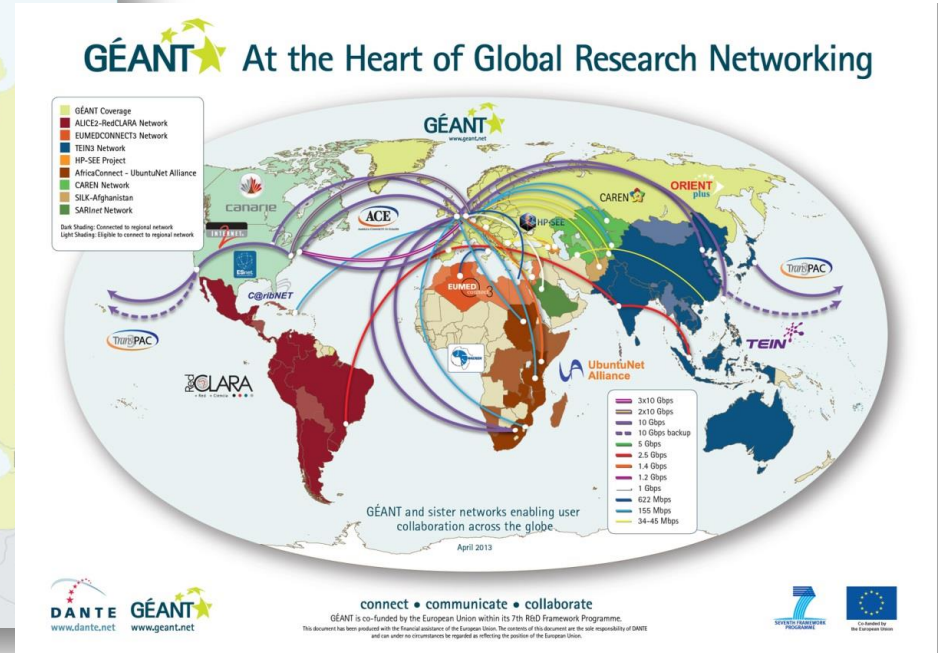
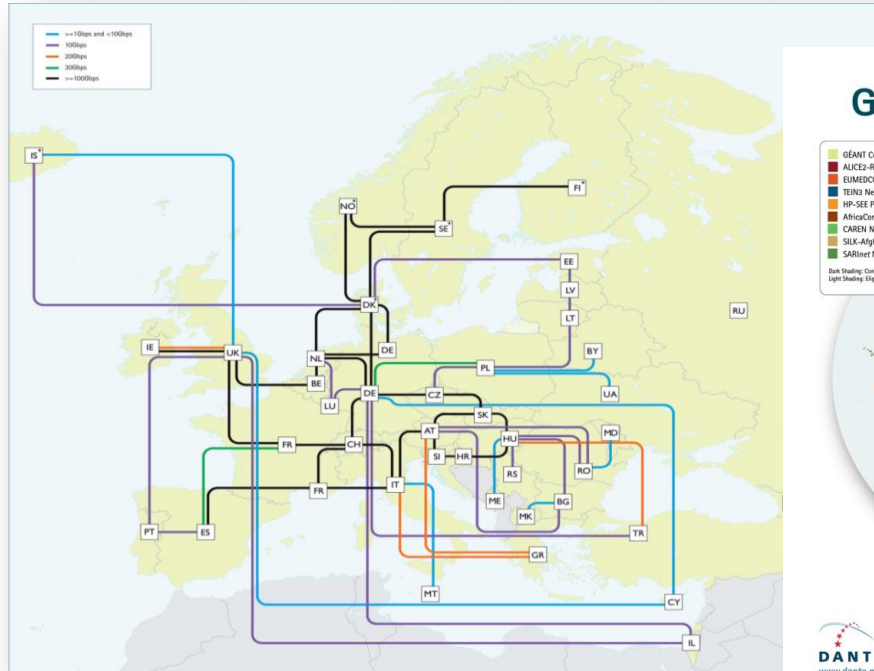
19 – 20 April 2016



Agenda

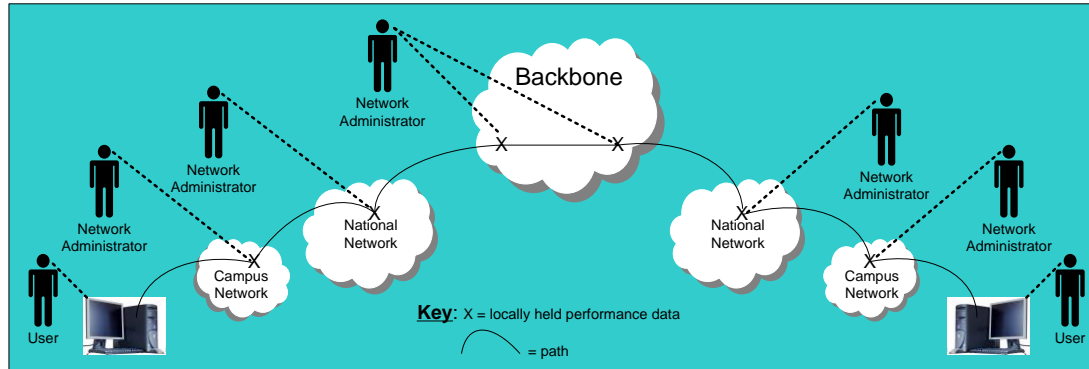
- Network performance problems
- What is perfSONAR
- perfSONAR use cases
- Deployment

Multiple domains



Across network boundaries

- Performance data fragmented and hard to access
- Difficult to find measurement capability
- Multi-domain problem diagnoses difficult and slow
- This complex, heterogeneous set of networks must operate seamlessly from “end to end” to support global science and research collaborations



Problems

- Performance issues are distributed and complicated for users
- When a network is underperforming or errors occur, it is difficult to identify the source, as problems can happen anywhere, in any domain
- Local-area network testing is not sufficient, as errors can occur at interconnection points
- In order to support users we must understand the network usage patterns and data trends
- Users often have limited IT skills
- “Soft failures” are different and often go undetected when basic connectivity (ping, traceroute, web pages, email) works but performance is just poor e.g.
 - Congested or underperforming links
 - Buffers causing dropping packets

perfSONAR Toolkit

Network performance metrics

- Throughput (stream of TCP data to show how much bandwidth one can get from the network)
- Latency (a train of UDP packets is send to show impact)
- Packet loss/duplication/ordering (verify reliable e2e transmission)
- Network utilization (port usage)
- Over time / on-demand



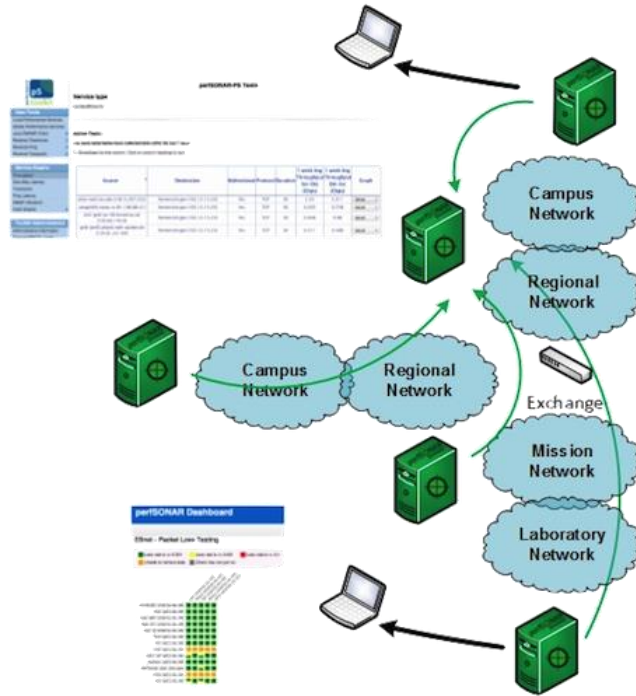
perfSONAR toolkit

- Open source implementation and packaging of the perfSONAR measurement infrastructure and protocols
- All components are available as RPMs, DEBs, and bundled as a CentOS 6-based „netinstall” and „fullinstall”
- Easy to install and configure for quick start
- Additional visualization available

perfSONAR in short

- **P**erformance focused **S**ervice **O**riented **N**etwork monitoring **A**rchitecture
- International collaboration for network monitoring
 - Working to build a strong user community to support the use and development of the software
- A tool to
 - Visualize, publish and archive network metrics data
 - Set network performance expectations
 - Find network problems
- Designed to troubleshoot when multiple networks are involved
- perfSONAR provides a standard way to publish monitoring data

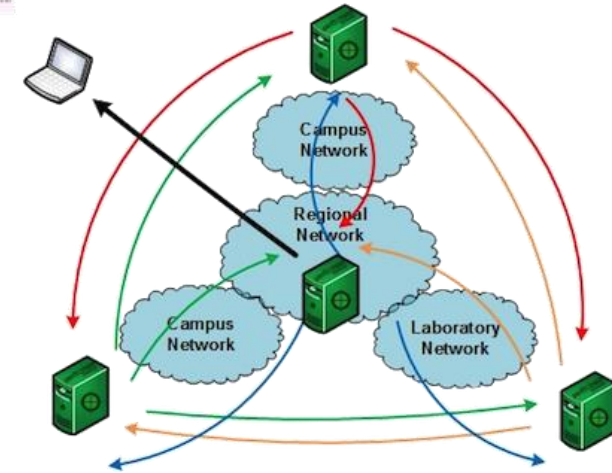
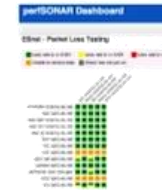
Beacon use case



- As a beacon, perfSONAR provides value to other users around the world
- Typically at the network boundaries to be used by their customers
- Allows to establish some set of tests from other locations
- Requires providing basic configuration to identify the node and allowing others to test to the node
- Minimal requirements for local storage
- End sites can then create dashboard applications, and incorporate the downstream node into their test sets
- Regular testing with selected tools helps to establish patterns – how much bandwidth we would see during the course of the day – or when packet loss appears

Mesh use case

- A full mesh means all hosts involved are running the same test configuration
- Typically used by networking providers to show performance characteristics between points of presence, as well as by virtual organizations to understand performance between participating locations
- Requires coordination of several nodes via a shared configuration file that describes a test
- Each host creates a set of tests to the other members of the mesh based on the configuration
- Data can be stored on each machine, or pushed to a central server running a dashboard application
- This configuration is read by the tools, which then perform the tests and store the results in either a central location, or on each of the members
- Software such as Maddash can be used to visualize the collective results



Benefits

- Helps finding and isolating problems in the network (or hosts)
 - Performance problems are often only visible at the ends
 - In a timely manner. Immediate access to the complete picture
 - No more waiting for others to provide their network monitoring data that affects your users' experience
- Provides network usage base
- Provides a source of network measurements for further diagnostics
 - Tackling potential problems which may adversely impact the researchers' voice, video or data communications
- perfSONAR allows you to maintain high-performing network
- More perfSONAR distributions equal better network visibility
- Active and growing community

Deploying perfSONAR

Node placement

- The server must become a citizen of the network - it has to be treated the same as other servers
- Place nodes where they will be most useful
 - at the demarcation point or borders
 - next to services (e.g. storage)
- In front of firewalls
- Describe and publish the node

Hardware selection

- Dedicated server is a best solution
- Dedicate 2 different interfaces for running latency and throughput on the same server
- Low-cost nodes
- VM not always perform well due to clock sync issues

Search

Filter results by searching for specific terms: 🔍

Search

Show All

Browser

- ▶ BWCTL Server 1606
- ▶ OWAMP Server 1609
- ▶ NDT Server 736
- ▶ NPAD Server 492
- ▶ Ping Responder 1892
- ▶ Traceroute Responder 1866
- ▶ MA 1489
- ▶ BWCTL MP 1399
- ▶ OWAMP MP 1399
- ▶ bwctl10g 5

Showing: 12497 of 12497 services on 1863 hosts.

Communities

Developer

Service Information

Service Name	Addresses	Geographic Location	Communities	Ver
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Host Information

Host Name	Hardware	System Info	Toolkit Version	C
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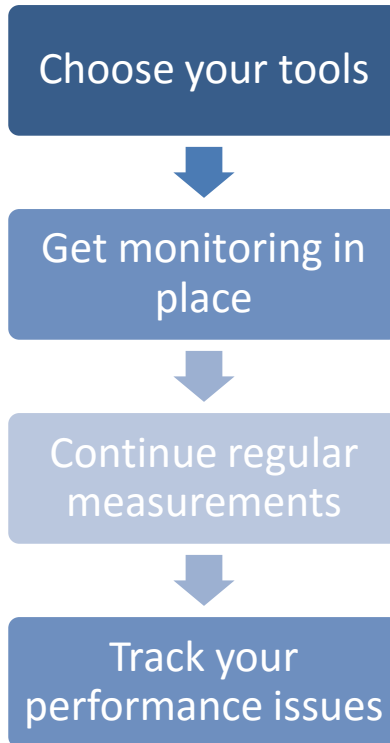
Service Map



Who is running perfSONAR

Worldwide deployment (<http://stats.es.net/ServicesDirectory/>)

Finding your way for perfSONAR



Additional information

www.perfsonar.net

perfSONAR

perfSONAR

[perfSONAR Toolkit 3.5.1 documentation »](#)

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perfSONAR Home

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Using and Interpreting perfSONAR

Navigating the perfSONAR Toolkit interface
Running measurement tools
Interpreting graphs and data

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1 Week REMINDER: perfSONAR 3.4.x End of Life Scheduling Announcement

Posted: March 30, 2016 - [perfnallink](#)

This is the reminder regarding the scheduled End of Life (EOL) for perfSONAR version 3.4.x. This is currently scheduled one week from now, Friday April 8th, 2016. All architectures and products related to perfSONAR Toolkit v3.4.x (386, i86, x64) are impacted, and the software will be removed from the active mirrors on that date.

A frozen version will be migrated to a vault, where v3.4 of this software will remain available indefinitely. You may use the vault in the same way you have used the mirrors in the past, however no update will be released for any of the software in this location moving forward. The vault can be enabled by making the following changes to `/etc/yum.repos.d/`:

```
[Internet2-Vault-p8PT-3.4]
name = Internet2 p8PT 3.4 Vault RPM Repository
mirrorlist = http://software.internet2.edu/mirrors/3.4/rpms/c16/BASEARCH/mirror/
enabled = 0
gpgkey = file:///etc/pki/rpm-gpg/RPM-GPG-KEY-Internet2
gpgcheck = 1
```

As of the end of March, 95% of perfSONAR instances are converted to 3.5.x, the remaining percentage is a mixture of 3.4.x instances and older unsupported products. The perfSONAR project strongly recommends that you migrate any old installations to the latest version before the EOL date to reduce the risk of security vulnerabilities.

CentOS Kernel & Debian Automatic Upgrade

Posted: March 25, 2016 - [perfnallink](#)

March 22nd marked the release of a new Red Hat CVE:

<https://rh.redhat.com/errata/RHSA-2016-0494.html>

New web100 kernel packages are now available for users of the perfSONAR toolkit. You may run `yum update` to grab the new kernel. You should restart your host after the upgrade completes. Note this is just a kernel upgrade and the other perfSONAR packages have NOT been updated.

Additionally, the perfSONAR team noticed that the automatic update routine described on our web site to keep your perfSONAR Debian/Ubuntu hosts up to date needs a manual action. Because of the change in the perfSONAR libraries we have introduced in 3.5.1 the automatic process does not conclude with a complete upgrade. For it to be fulfilled, one must run the following command manually once:

```
sudo apt-get dist-upgrade
```

Symptoms of not running this command may result in some perfSONAR services unable to start/restart or not working correctly.

perfSONAR User Guide

perfSONAR Installation

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Demon

...

perfSONAR User Guide

perfSONAR is a collection of software for performing and sharing end-to-end network measurements. This document guides you through the process of installing, configuring and using the perfSONAR on one or more hosts.

perfSONAR Installation Options

- perfSONAR Installation Options
 - System Requirements
 - CentOS Toolkit ISO Installation
 - CentOS Bundle Installation
 - Debian Bundle Installation

perfSONAR Toolkit

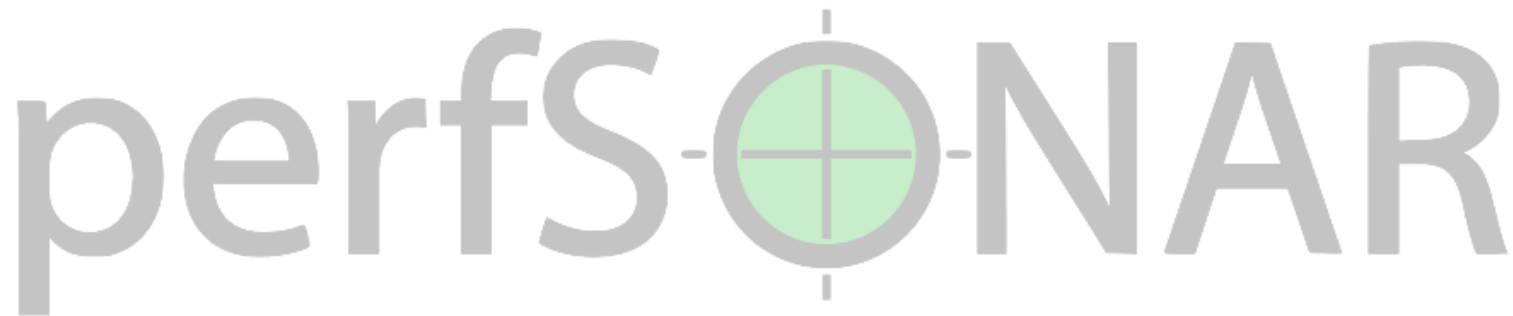
Installation

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- Toolkit Full Install Guide
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- Configuring the Toolkit for the First Time
 - Your First Login
 - Accessing the Web Interface
 - Updating Your Administrative Information
 - Managing Toolkit Security
 - Scheduling Regular Measurements
 - What next?

Managing the perfSONAR Toolkit

- Choosing a Management Method
 - Standalone Node

docs.perfsonar.net



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