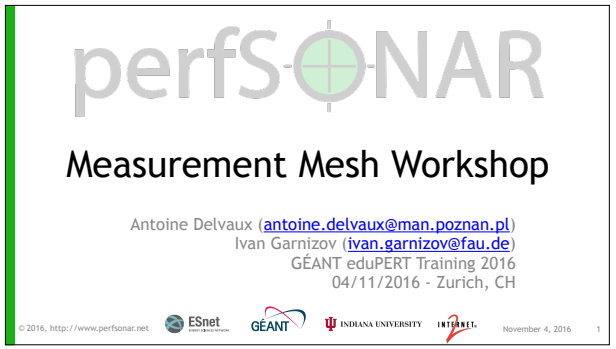

Measurement Mesh Workshop

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Why Performance Measurements?

- Consistent behaviour in performance requires correctness
- Correctness requires the ability to find and fix problems
  - You can't fix what you can't find
  - You can't find what you can't see
- **perfSONAR lets you see the performance of your network**
- Fix problems in your infrastructure
- Prove to other that your infrastructure is behaving well
  - Many players in an end to end path
  - Ability to show correct behaviour aids in problem localisation

2

What is perfSONAR?

- perfSONAR is a tool to:
  - set network performance expectations
  - find network problems (*soft failures*)
  - help fix these problems
  - all in a multi-domain environment
- Standard way to publish network monitoring and performance data:
  - Your node can be public, like many (~2000) around the world
  - You can make measurements towards any public node
  - Service Directory: http://stats.es.net/ServicesDirectory/

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perfSONAR 4

perfSONAR components

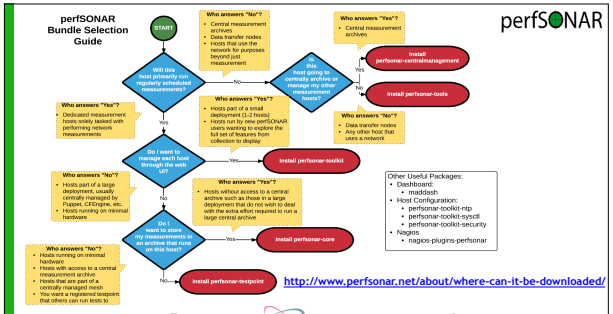
- Measurement tools, providing the data
- Archives, receiving and storing the data
- Middleware and scheduler: orchestrating and passing the data around
- Presentation and visualisation tools
- Administration tools

perfSONAR 5

perfSONAR bundles

- Different ways to install perfSONAR
- Full toolkit install:
  - standalone and versatile
  - need a dedicated and powerful enough machine
- Bundles of components (more flexibility)
  - testpoint: make measurements
  - central server: organise, store and present measurements
  - toolkit: the toolkit, managed your way

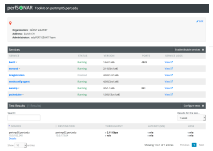
perfSONAR 6

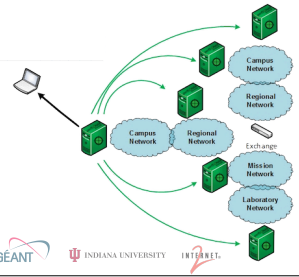


http://www.perfsonar.net/about/where-can-it-be-downloaded/

perfSONAR 7

Performance Island





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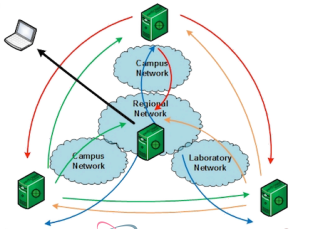
perfSONAR 8

Performance Coordination



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perfSONAR 9

Importance of Regular Testing

- We can't wait for user to report problem, soft failures can go unseen for years!
- Things just break sometimes:
  - failing optics
  - broken fibers
  - hardware goes bad
- Problems that get fixed have a way of coming back
  - system defaults, restoring of old configurations
  - new people don't know history of problems and corrections
- Important to continually collect, archive and alert on measurements. See trends

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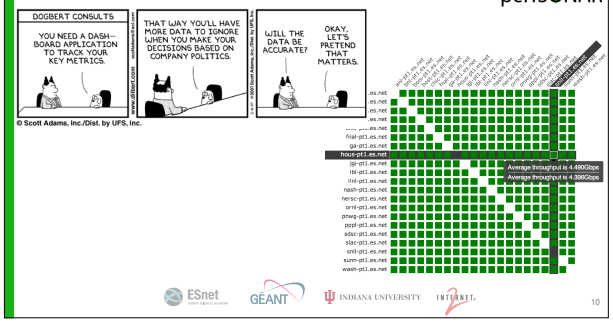

Workshop Objectives

- Being able to deploy a central perfSONAR server (Archive and Dashboard) for a set of preconfigured perfSONAR clients.
- Doing a deployment similar to what we've done in the ***perfSONAR on Small Devices in GÉANT*** project.

Workshop context and … warning

- We will be working with perfSONAR 4.0-RC
- Release Candidate, still some rough edges
  - Final release expected early December … or January
- Deployed in a lab environment, which is not what perfSONAR is at ease with
- The most important are the concepts
- Better that then a workshop on an outdated version of perfSONAR

perfSONAR 13

Workshop Lab Setup

- Private network (OpenStack based, private address space)
- 4 *Global/Common* Measurement Points (MP)
- Group of 2:
  - 1 Measurement Point (toolkit bundle install)
  - 1 Central Server (centralmanagement bundle)
- Building a mesh of 5 MP

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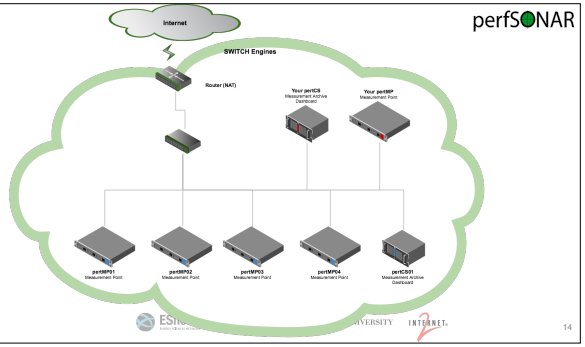

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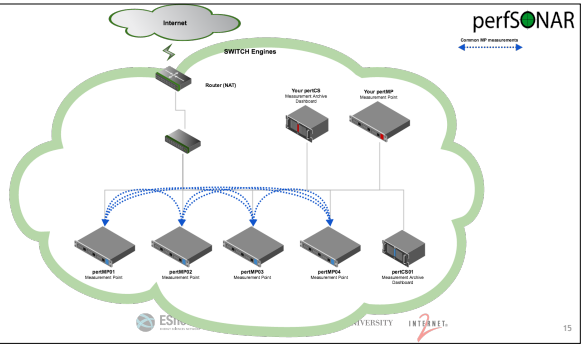
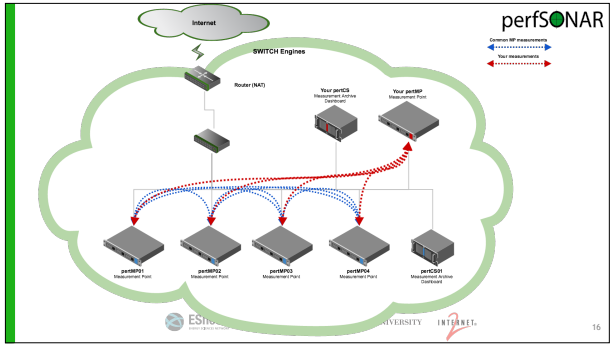
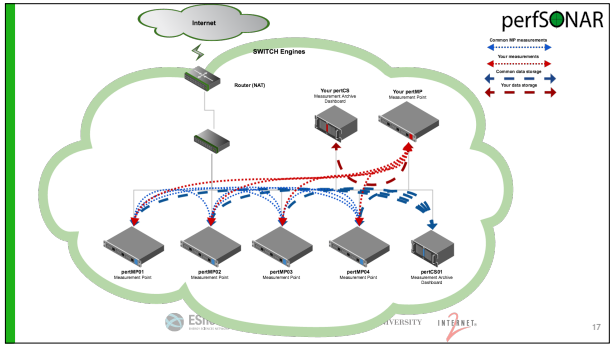




16



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perfSONAR

Hands-On: Central MA

- Central Measurement Archive (MA)
  - esmond
  - part of the perfsonar-centralmanagement bundle
- What we'll do:
  - Configure repository
  - Install software bundle
  - Configure esmond
  - Look at log files
- Wiki for commands: https://wiki.geant.org/display/gn42na1/During+the+training#Duringthetraining-CentralMeasurementArchive

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perfSONAR 19

Central MA: Commands

```
rpm -hUv http://software.internet2.edu/rpms/el6/x86_64/main/RPMS/Internet2-repo-0.6-1.noarch.rpm
rpm -hUv https://dl.fedoraproject.org/pub/epel/6/x86_64/epel-release-6-8.noarch.rpm
yum install perfsonar-centralmanagement
# Log files
tail /var/log/httpd/error_log
less /var/log/esmond/esmond.log
ps aux | grep httpd
ps aux | grep cassandra
netstat -tunlep
```


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Hands-On: Sending data to MA

- Toolkit install
  - storage on local MA
  - authentication through API key (part of regular installation)
- Central Server
  - authentication through API key, must distribute key
  - authentication based on IP, must know the MP IP
- Workshop
  - IP based authentication setup
  - Wiki for commands: https://wiki.geant.org/display/gn42na1/During+the+training#Duringthetraining-IPAuthentication

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MA Config: Commands

```
cd /usr/lib/esmond
source /opt/rh/python27/enable
/opt/rh/python27/root/usr/bin/virtualenv --prompt="(esmond)" .
. bin/activate
python esmond/manage.py add_user_ip_address example_user 10.0.172.1
python esmond/manage.py add_user_ip_address another_example_user 10.0.182.1/24
```

Hands-On: MaDDash

- Already installed (part of perfsonar-centralmanagement bundle)
- Configuring web interface (YAML format)
  - default dashboard, multiple dashboards
  - external menu, grid colours and sizes
  - welcome/redirect page
- Look at MaDDash report (on your mesh) and log files
- See wiki: https://wiki.geant.org/display/gn42na1/During+the+training#Duringthetraining-Dashboardsetup
- Example: https://pertcs01.switch.ch/maddash-webui/

MaDDash Config: Commands

```
cd /etc/maddash/maddash-webui
# Compare config.json and config.example.json
vi config.json
# Reload http://pertcsXY.switch.ch/maddash-webui/etc/config.json
# Add a redirect in /var/www/html/index.html
# Running processes
ps aux | grep maddash
ps aux | grep httpd
# Log files
tail /var/log/httpd/access_log
/etc/init.d/maddash-server start|stop|restart
```