

HINTS

- ***Context, purpose***
- ***Behind the scene***
- ***In action***
- ***Status, future***



HINTS

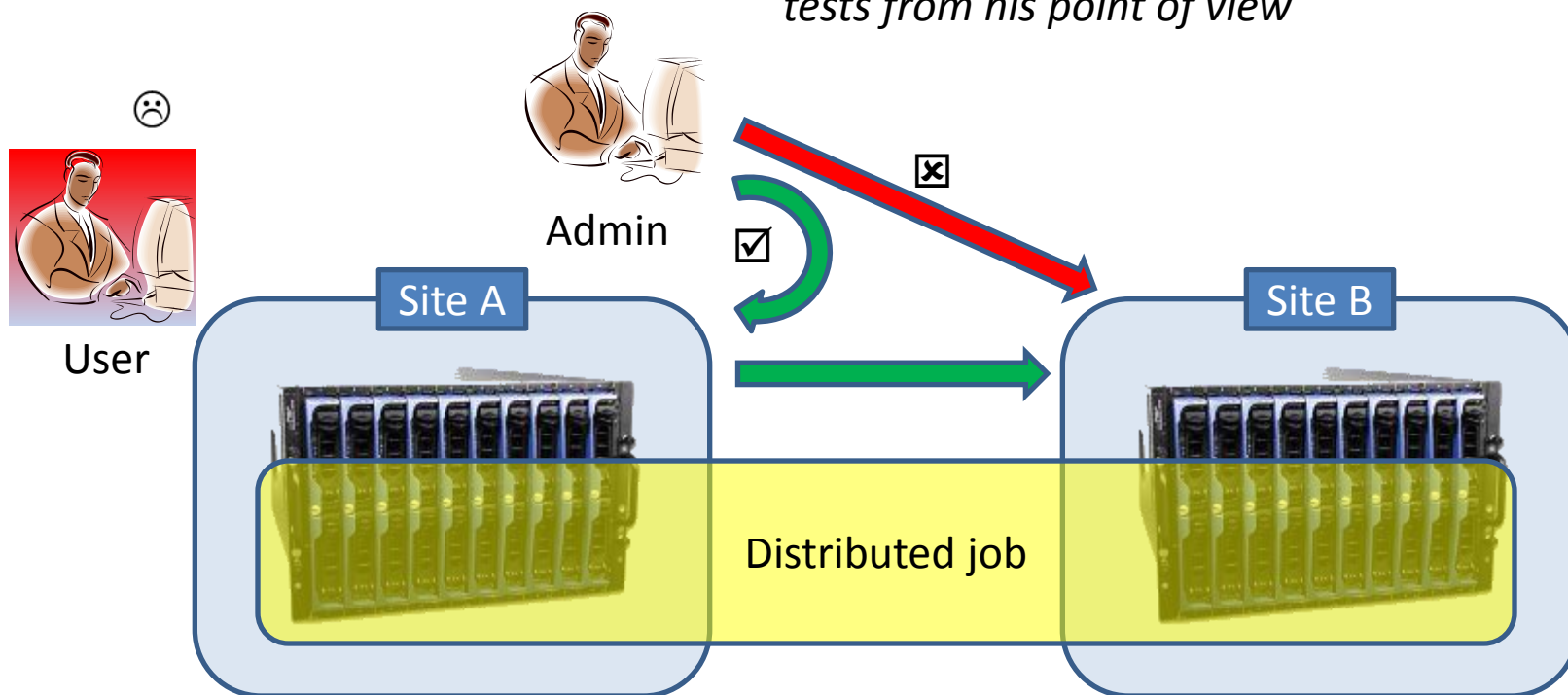
Network troubleshooting for data-grids



Context, purpose

HINTS?

- User of site A: *My job has a performance problem! I'm sure it's a network issue!*
- Admin of site A, inquiring for *network status A ↔ B*:
 - *I can run tests from the site A point of view*
 - *But I need to call site B admin for him to run similar tests from his point of view*



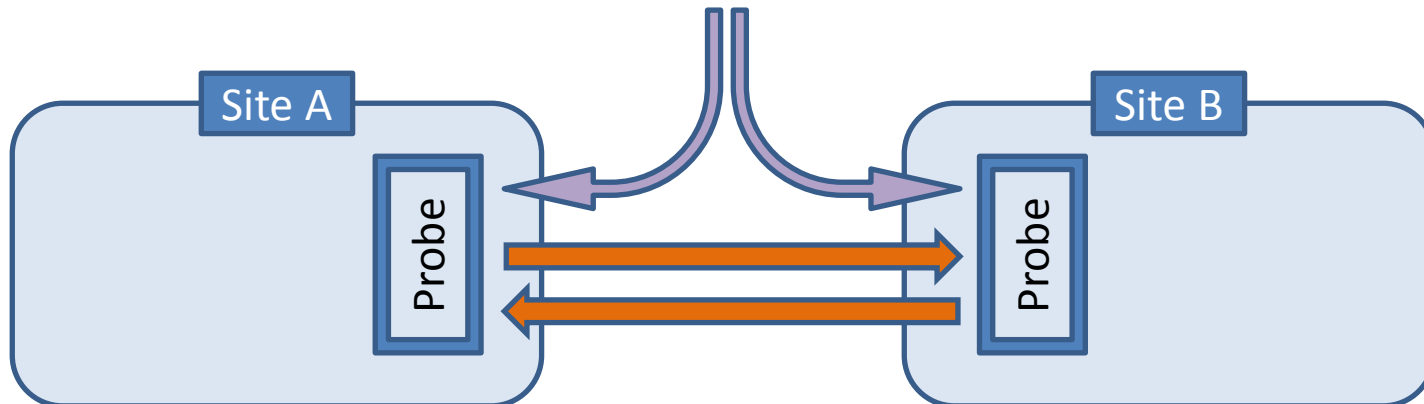
Today HINTS is:

- Inspired by *perfSONAR Lite TSS* (EGEE era),
- Continuation of *E. Dublé's* work (2010/2011),
- Today maintained by ~5 people (part-time / CNRS-FR),
- Under *Mario Reale* (GARR-IT) management.



HINTS' goal is to provide:

- A central access point
- To distributed secure probes
- For quick&easy network analysis.



HINTS stands for “**H**ints for **I**ntermediate **N**etwork **T**rouble**S**hooting”

Features :

- Site A admin can run network tests from Site B side → *If trusted by B admin, A admin can diagnose A ↔ B network from both sides.*
- Primary network analysis tools are provided in a web interface → *Diagnostic is quick to obtain and just a click away.*
- The same entry point provides access to many sites → *You can record as many sites as desired, each one having any number of probes.*
- Once logged, one can only perform allowed actions → *Security is an important aspect in HINTS, before its features.*
- Authorization task is not the admin job → *User can delegate his rights to another user he trusts*
- Busy administrator? → *All network tests can be run by granted users!*



HINTS

Network troubleshooting for data-grids



Behind the scene

The probes ...

can ...

- ping
- traceroute
- nmap (port scan)
- dig (DNS resolution)
- iperf (bandwidth)

each other.

are based on

perfSONAR

The server ...

provides a web based interface

Both ...

run on



Scientific Linux

are easy to install



need a valid server certificate



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Network troubleshooting for data-grids



In action

HINTS homepage



Please enter your credentials:

login name	<input type="text"/>
password	<input type="password"/>

Connection

Or, if you are a new user:

New user registration 1/2

When a new user has filled a registration request, he gets a confirmation mail:

Hello albert!

In order to validate your registration to the HINTS system,
please click on the following link:

<https://<your HINTS URL>/request/confirmation?id=7&hash=xxxx>

Thank you! The HINTS team.

New user registration 2/2



Please enter your credentials:

login name	<input type="text" value="aeinstein"/>
password	<input type="password" value="•••••"/>

Connection

Or, if you are a new user: [Register](#)



Logged in as:
albert einstein

log
out

Troubleshooting

Settings ▼


My Profile

Contact admins

No probes are currently accessible to you. In order to be able to use the system, you must be allowed to access at least one probe. This may occur if you install a probe at your site and register it (using the menu 'Register a new probe'), or if you request more access rights (using the menu 'Request additional access rights').

User access request 1/3

Please grant me access to a site probe(s):



HINTS

Hints for Instantaneous Network TroubleShooting

Logged in as: albert einstein

log out

[Troubleshooting](#)
[Settings ▼](#)
[My Profile](#)
[Contact admins](#)

Please select what kind of access rights you need:

- ☒ Access to a site (be able to troubleshoot by using its probes)
- ☐ Admin access to a site (be able to remove its probes)
- ☐ Access to an Operation Center (be able to troubleshoot by using the probes at any of the related sites)

Country where this site is located:
France ▼

Name of the site:
CNRS-DSI-Toulouse ▼

Validate

User access request 2/3

All administrators gets a request mail:

Hello Olivier.

An HINTS user requested something which needs to be confirmed by an admin.


You are an admin and this is why you are receiving this email.

Please go to <https://<your HINTS URL>> in order to validate or deny this request. (If another admin answers the request sooner than you, the screen may be blank finally).

Thank you! The HINTS system.

User access request 3/3

Admin granting screen:



Logged in as: Olivier Lenormand [log out](#)
(Administrator)

Troubleshooting Admin settings ▼ My Profile

Some users with no super-admin rights have made the following requests, which need to be validated or denied by an admin like you.

Description	Actions
albert einstein wants to be able to access site 'CNRS-DSI-Toulouse' (i.e. be able to troubleshoot by using any of its probes).	<input type="button" value="Accept"/> <input type="button" value="Deny"/>

User confirmation mail:

We are happy to inform you that your request to be able to access site 'CNRS-DSI-Toulouse' (i.e. be able to troubleshoot by using any of its probes) was just validated.

Some tests!

First, let's choose which test we want to run:

Please select one of these types of measurement:

- ☐ Ping
- ☐ Traceroute
- ☒ Port Scan
- ☐ DNS query
- ☐ Bandwidth test

And between which set of {country/site/probe}.

Port Scan

 from source probe

lgpsonde.dsi.cnrs.fr

 to remote probe

fts1.dir.garr.it

settings:

Scan from port 22 to port 25

Some tests may accept additional parameters

Some tests! - ping 1/2

Troubleshooting
Admin settings ▼
My Profile

Measurement to be done:

Ping
from source probe
lgdsonde.dsi.cnrs.fr
to remote probe
fts1.dir.garr.it

1
Run this test!
Reset values

Please select the **remote** probe of this measurement:

Select the country where this probe is located: Italy ▼

Select the site where this probe is located: Roma ▼

Select the probe: 193.206.106.32 fts1.dir. ▼

Remote probe: fts1.dir.garr.it

Let's ping(1) Mario's probe
from France...
Sounds good! (2)

Result:

PING 193.206.106.32 (193.206.106.32) 56(84) bytes of data.

64 bytes from 193.206.106.32: icmp_seq=1 ttl=49 time=44.3 ms

64 bytes from 193.206.106.32: icmp_seq=2 ttl=49 time=44.4 ms

64 bytes from 193.206.106.32: icmp_seq=3 ttl=49 time=44.4 ms

64 bytes from 193.206.106.32: icmp_seq=4 ttl=49 time=44.1 ms

64 bytes from 193.206.106.32: icmp_seq=5 ttl=49 time=44.5 ms

--- 193.206.106.32 ping statistics ---

5 packets transmitted, 5 received, 0% packet loss, time 4050ms

rtt min/avg/max/mdev = 44.158/44.394/44.558/0.188 ms

2

Some tests! - ping 2/2

Let's try the other way: ping France from Italy

from source probe to remote probe

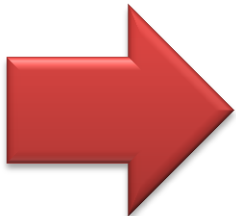
Result:

PING 193.55.90.91 (193.55.90.91) 56(84) bytes of data.

— 193.55.90.91 ping statistics —

5 packets transmitted, 0 received, 100% packet loss, time 14000ms

Hmm, it seems we bumped into an unfriendly firewall...



HINTS allowed a user located in France to detect a network problem which can usually only be seen from outside : ping goes outward but is firewalled inward.

Some tests! - traceroute

from source probe
 to remote probe

Result:

traceroute to 193.206.106.32 (193.206.106.32), 30 hops max, 60 byte packets

```

1 193.55.90.18 (193.55.90.18) 3.306 ms 3.642 ms 4.299 ms
2 193.55.105.82 (193.55.105.82) 5.682 ms 6.449 ms 7.109 ms
3 * * *
4 te1-3-montpellier-rtr-021.noc.renater.fr (193.51.189.33) 25.499 ms 25.671 ms 26.227 ms
5 te1-2-marseille1-rtr-021.noc.renater.fr (193.51.189.21) 27.188 ms 27.906 ms 28.683 ms
6 te0-0-0-lyon1-rtr-001.noc.renater.fr (193.51.189.17) 31.994 ms 21.836 ms 23.577 ms
7 te0-3-1-0-paris1-rtr-001.noc.renater.fr (193.51.189.125) 150.574 ms 150.561 ms 150.551 ms
8 renater.rt1.par.fr.geant2.net (62.40.124.69) 23.108 ms 23.340 ms 24.121 ms
9 as1.rt1.gen.ch.geant2.net (62.40.112.29) 34.146 ms 34.563 ms 35.314 ms
10 as0.rt1.mil.it.geant2.net (62.40.112.34) 42.481 ms 42.838 ms 43.571 ms
11 garr-gw.rt1.mil.it.geant2.net (62.40.124.130) 34.827 ms 35.494 ms 35.566 ms
12 rt1-mi1-rt-mi2.mi2.garr.net (193.206.134.190) 35.542 ms 35.196 ms 35.152 ms
13 rt-mi2-rt-rm2.rm2.garr.net (193.206.134.230) 44.333 ms 43.721 ms 43.752 ms
14 rt-rm2-rt-rm1-l1.rm1.garr.net (193.206.134.117) 44.186 ms 44.984 ms 44.896 ms
15 rt-rm1-ru-dir-l2.rm1.garr.net (193.206.131.130) 46.352 ms 46.274 ms 45.053 ms
16 natpt.dir.garr.it (193.206.159.242) 44.754 ms 44.975 ms 44.946 ms
17 fts1.dir.garr.it (193.206.106.32) 44.910 ms 43.735 ms 52.507 ms
    
```

Some tests! – port scan

Port Scan

 from source probe

lgpsonde.dsi.cnrs.fr

 to remote probe

fts1.dir.garr.it

Run this test!

Reset values

settings:

Scan from port 22 to port 25

Result:

Starting Nmap 5.21 (<http://nmap.org>) at 2011-09-16 11:36 CEST
Nmap scan report for fts1.dir.garr.it (193.206.106.32)
Host is up (0.057s latency).
PORT STATE SERVICE
22/tcp open ssh
23/tcp closed telnet
24/tcp closed priv-mail
25/tcp filtered smtp

Nmap done: 1 IP address (1 host up) scanned in 0.27 seconds

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Some tests! – DNS query

DNS query

 of host

www.google.com

 performed at probe

fts1.dir.garr.it

Run this test!

Reset values

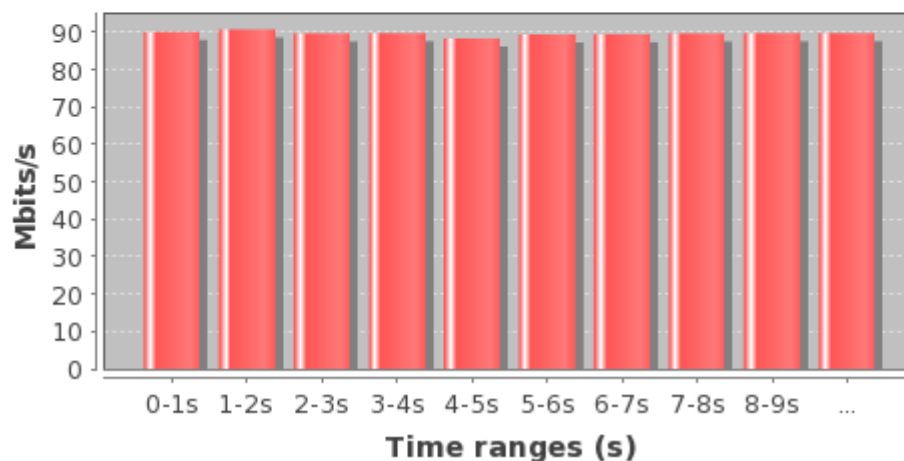
Result:
www.l.google.com.
74.125.39.104
74.125.39.105
74.125.39.106
74.125.39.147
74.125.39.99
74.125.39.103

Some tests! – Bandwidth

from source probe
 to remote probe

settings:

- Average bandwidth achieved: **89,70 Mbits/s**
- Per-second variation plot (zoom level):





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Status, future

Status – September 2011 1/2

- HINTS is a young product, but so far it's already usable!
- HINTS is not used yet in real life, but we are looking for volunteers. Anyone? Any input could lead to improvements.

HINTS suffers from some already identified limitations.

We plan to fix them, in the following order:

1. Both the server and the probe can't run on a 64bit OS
2. Both the server and the probe are not IPv6 friendly
3. Both the server and the probe rpm are non removable

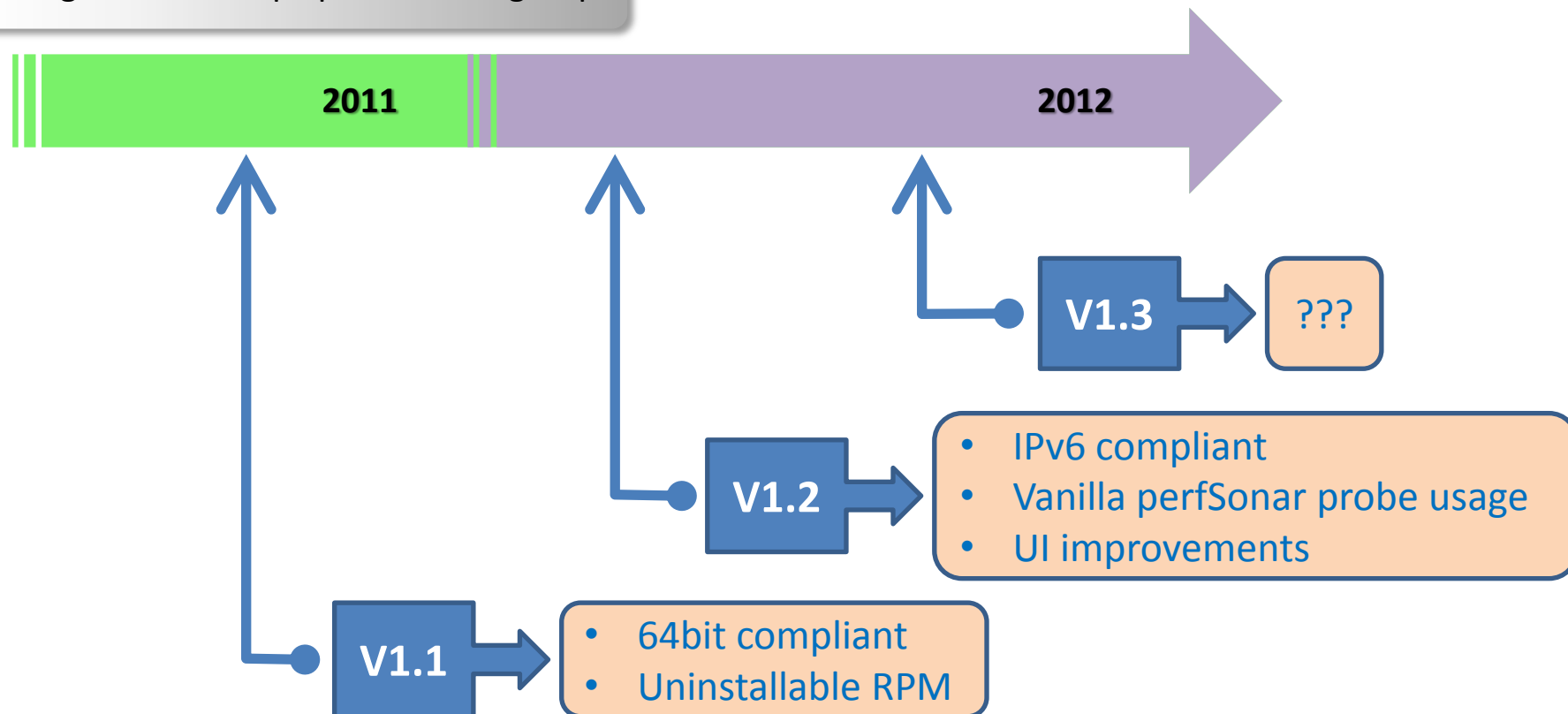
Status – September 2011 2/2

Besides, we are already working on two points:

- HINTS's probe is a modified version of a non up to date perfSonar probe.
We are building up a group with *Domenico (DANTE)* to find out how HINTS could use the vanilla probe without losing functionalities and security.
- We are adapting HINTS java server code in order to:
 - Make the code match our coding and architecture rules,
 - Be able to efficiently fix a bug or improve a user function.

Future?

Merge HINTS and pS probes workgroup





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Thanks for your attention.
Any questions?

HINTS home: <https://aresu.dsi.cnrs.fr/spip.php?article92>