

HINTS-PerfSONAR MDM - VCONF – June 6, 2012 – 11:00 AM CEST

Participants (9):

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Olivier: purpose of this meeting is **to understand whether we can converge to a unique PerfSONAR development trend involving also HINTS**, and, more specifically, if we can come to a common understanding of a possible unified deployment scenario for HINTS probes and the pS deployment of Measurement Points.

I'd like to provide you with a few-words introduction on HINTS and its basic underlying concepts:

HINTS is a network diagnostic tool, deployed through a central server and various probes. Provides on-demand measurement related to the following metrics: Ping (RTT), Traceroute, IPERF, reverse DNS check, NMAP (portscan). The server contacts the probes, and then by means of them performs the measurements. Overall, therefore, HINTS it's a tool for on-demand network troubleshooting

HINTS can make quick diagnostics – One of the nice features of the system is that the user does not need administrative rights to run the tests, and can run the tests in 2 directions, from site A to B and vice versa, without having administrative rights, no need for them. The user is quite autonomous in the usage of the system. This is what HINTS does.

A few words on how we manage users: once a new user registers to the system, initially he has no rights. To get the rights, either the HINTS server administrator has to allow him to work with a subset or all the probes the server has available or an existing HINTS users can allow someone he knows to have a part or all of his/her rights: delegation is possible therefore. It's therefore available a model for trust delegation between users.

The idea today is mainly what we can do on the probes. I know you do not call them "probes" in the pS environment. **Roland:** On pS-side they are called **Measurement Points** (pS-MP).

Olivier: At the beginning of the development, HINTS took the pS side binaries. We started from there to build a probe.

Probes have evolved since then. We are not using the very last version of your perfSONAR product therefore.

Essentially, we have changed the original pS model in 2 ways:

- 1) In perfSONAR, the OPPD module from scratch was able to handle SSL Authentication, but by default this is set to off. OPPD does not normally use SSL AuthN method, however it is able to. So, we did set this option ON in HINTS. On the probe side of HINTS – when we deliver BWCTLS binaries and OPPM, we also bring some EUGridPMA certificates, so that probes are X.509 authN by OpenSSL. This is a first major difference with standard perfSONAR. The modification in this case is very small: we just turned on this option. We told OPPD where to get the certificate from. I do not think this is a major change; I do not why in pS today you do not use it.
- 2) The bigger change is that when requesting an IPERF test, the IPERF binary is driven by the BWCTLD module. In pS-MDM BWCTLD is a unique daemon, always running, waiting for connections. In HINTS we thought that this was a potential risk, a security weakness, since anyone could try to invoke a test without being allowed to. To make this scenario impossible, we changed the way BWCTLD is running: it's no longer a daemon, it's a binary, and another Daemon starts BWCTLD on demand. When the test is finished, the BWCTLD is stopped. This was done therefore for security reasons. Our daemon is only listening on the local host: none from outside the server could connect.

Roland: As far as I know, BWCTL would be possibly connecting/ binding to a specific interface, so you can configure it, together with listen port. You could configure Listen port to listen only to local interface. That would be then exclusive. This would be a reasonable workaround for this.

Olivier: I want to be clear: please accept my sketchy summary on the listing of differences, and try to move on with this. We have taken some parts of your system, made some changes, and now the two development streams are forked, this is not desirable and easily sustainable. We would like to be up to date with the latest perfSONAR base. This is the first thing. We clearly would like to reach users, and this is probably an opportunity to gather our efforts.

If our server could use the perfSONAR Measurement Points, that would be very desirable for us. We could benefit also from pS installations. That would be easier; people who are already installing pS would not need to additionally install the HINTS probes. Deployment would be nicer and simpler in this respect. pS-MDM has many sites installing it: would be possible for us to have the opportunity to use the pS-MDM MPs ?

Mario: HINTS derives historically from PerfSONAR-Lite-TSS: there was, at least at that time – room for the need of the provided metrics/functionality from HINTS. I would like to ask Roland whether HINTS would bring added value, in his opinion, to the set of current provided perfSONAR-MDM services:

Roland: HINTS would be a user interface, similar to webCNM and Web pS UI. Roughly at the same level of HINTS server: they are similar in this sense. They allow users performing tests. They would be similar. pS-UIs and HINTS would be nice then to extend the set of covered metrics. Part of the cooperation therefore could be within our Visualization Team and HINTS.

Mario: And more specifically in terms of deployment modules and for the probes? Would they be compatible? Do you think we could be trying to build an integrated module: to be able to offer to people the same deployment module, same machine. Is this feasible?

Roland: it would depend on the required exact changes on OPPD : if it's only the OPPD that needs to be activated, that would not be a major problem or change. If you want to belong to HINTS – activate SSL ...that would be OK. If you say that if you want to be part of HINTS/pS activate or switch off SSL, that might be OK.

Apart from that, it would depend on the BWCTL exact differences. Also if Queries are interchangeable or not... I think we need to further assess this into more technical details.

Mario: Susanne, do you think that – coming from the pS-Lite TSS experience, how close you felt that pS-Lite could have been integrated into standard pS?

Susanne: It was different. We did use the working perfSONAR, but PerfSONAR-Lite-TSS was not using the standard pS-Measurement Points. We only had probes running within the EGEE grid environment. We did not use the standard MPs.

Mario: But the low level, web services protocols were the same ?

Susanne: yes. It was however a different User Interface, and not part of pS-UI...

Mario: I am trying to understand whether we agree, we have a common understanding of what we could be doing. Do you think that trying to include HINTS functionality would bring added value to pS-MDM? HINTS brings some added value to the current pS-MDM set of services? (Like pS-Lite TSS did...)

Roland: from the users' perspective, I think Domenico could comment on this.

Form the Technical perspective, I think there is some added value. AAI in pS-MDM for example, it's something along SSL probably; pS would face the same challenges – especially for BWCTL.

Mario: And for the metrics? Do you have portscan (nmap) in pS?

Roland: not currently. Generally, what was in OPPD in pS-Lite TSS could easily be integrated in perfSONAR. The question is more on the protocols, standard or not. Adding a module for scan functionality in pS would be useful.

Domenico: I think we are missing at least some of the metrics provided by pS-Lite/HINTS. I think that HINTS introducing some real AAI is an added value of HINTS, Certainly. A security module as well is required in perfSONAR-MDM. We already got some requests for certificates: Lot of users we have is also Grid users, already owning an X.509 certificate. So implementing some AAI related to this would be nice I think. AAI is a necessity : We already got a request for X.509 AAI for pS: lots of users – Grid users for example – already have them. So X.509 AAI in pS would be very welcome.

A question for Susanne: To implement port-scan, reverse DNS, traceroute, ping, etc. Did you have to change the basic protocol?

Susanne: No, I think we did not change it.

Mario: so, there would be no need to change the pS-baseline, in terms of required development... Am I correct? Basic protocol would be the same, right?

Roland: It depends on the requests schema mainly which has been implemented. I was under the impression that the pS-Lite TSS was not really integrated within the OGF schema for requests.. It was not really connected to the OGF developments, it was sort of non-standard. We will have to check carefully this. We will have also to agree with other pS partners. We will have to think about it. To integrate the functionality, the schema has to be agreed upon, validated.

Olivier: I'd like to tell Domenico, about the certificates: HINTS uses the server certificates for the technical modules, for intercommunication. It was for the server-client communication. Not for users. Users can use local user/password or the EGI (EUGridPMA) certificates (if she/he wants)
HINTS uses certificates between probes and Server : each time the server wants to run something, and the probe wants to communicate, this is required. A human on the Web Interface uses either username & password or X.509 certificates.

Domenico: I was thinking of giving Grid/pS users the opportunity to use the X.509 user certificates for Authentication, mainly. They would already have them available. Implement this solution on a large scale for pS.

Olivier: also, for me, **to summarize what I understood so far:** today pS does not do ALL the things done by HINTS. There are a few things done by HINTS not done by pS. From your point of view, the things done by HINTS are interesting, and you already had some sort of plans for this. You are planning to implement them via the main pS development stream, is this correct?

Roland: We partially had plans for this. We had some sort of plans for X.509 certificates, for example.

Olivier: for the technical metrics? Ping, traceroute...you are not doing this with pS today, but you will be doing them tomorrow, right?

Roland: Ping and Traceroute at least are also on the agenda.

Domenico: I am not sure about **nmap** though. We have not got any request like this to my knowledge so far. If there'll be use cases like that, your experience will be extremely interesting for us.

Roland: We don't have requests for **nmap** into pS-MDM so far. I think Internet2 has implemented some of these metrics. We would have the option to have it at large. We would have a problem generally with having another module. If somebody uses it, it's fine. Having it as a mandatory service (use case), having another module, mandatory part of our pS-Use Cases, we would have problems to offer it as part of the main package. It would be rather an optional component. We can't force users to use it.

Ping and traceroute are on our longer term roadmap timeline. Nmap won't be a problem. Probably the perfSONAR light functionality could be integrated in standard perfSONAR. For example the port-scanning functionality could be added (nmap).As an optional component. (Ping, Traceroute, nmap).

Mario: Would you be then interested in trying therefore to find out what could be the added value of HINTS in terms of AAI, and the system?

I think, for example, pS-Lite was very much bound to the GOC Database. It was taking information from a very structured schema taken by the GOC DB. This dependency was considered to be too rigid, was dropped in HINTS. This is very flexible now.

Coming back to my point:

How do you think it would be interesting for perfSONAR to understand which actual added value could be provided by HINTS.

Troubleshooting has been identified as one of the most relevant use cases for Grids in EGI Network Support.

Domenico: Not only for Grids, also for the NREN community: our first use case is troubleshooting. Any joint activity in this direction would be Brilliant.

Olivier: to be clear, on our side, is pS today delivering some on-demand features? Or is it only a scheduler, running test on a pre-define schedule, and the user can just check what is running now and what was running in the past? **Can the pS user run tests on demand?**

Domenico: we have both at the moment. We have PERT and NOC experts inspecting regularly scheduled measurements and we have the option to have bandwidth on demand measurement. Roland can comment, he is currently working on the **on-demand service for the OWD**, Jitter, and Packet Loss measurement between 2 Measurement points. Ask for on demand measurement on OWD, packet loss.

Roland: we're basically developing pS Measurement Points that implement OWAMP interface. We are supporting OWAMP requests to pS , which then triggers OWAMP clients to set up and run an OWAMP server somewhere remotely and measuring the One Way Delay, retrieving measurement data , displayed through the UI – this is one thing we are supporting -

Scheduling is currently done as a sort of *side effect* of being able to do on-demand tests.

We are now for OWAMP implemented this: we are regularly scheduling small pS command line clients commands sending requests against remote MPs, executing the measurements, and then archiving them in Measurement Archives. Data can therefore be then used by User Interfaces to look at pre-scheduled data. pS can be used for on-demand tests and scheduled ones.

Roland: In summary: **MPs providing on demand measurements, schedulers using the on-demand services to make scheduled measurements, and Measurement Archives storing these scheduled measurements data – and allow users to look at them through the User Interface.**

Mario: just to understand: the on demand features belong to Measurement Points, Schedulers do contact MPs to perform scheduled measurements:
How much of this on-demand functionality shipped to the end users?

Roland: They can perform exactly the same measurement the schedulers do.

Mario: which currently are? Which metrics?

Roland: Basically, currently, the BWCTL metrics, currently (Available bandwidth).
We are in process of releasing OWAMP as well: we need a few more months; specifically we are for example still missing a User Interface for this.
So, overall, only on demand is Bandwidth on demand. Latency is only scheduled. (Latency is available through the Measurement Archives, not yet on demand).

Mario: to summarize, as of today users can perform on demand BWCTL measurement (available bandwidth).
So, to make a sort of a provocative, naïve, comment: **may be HINTS is the User Interface you are missing?** A UI (in your terms) for many currently missing on-demand measurements from pS as of today. Am I being too naïve?

Roland: Domenico do you want to say anything about the general UI status of pS?

Domenico: I am not sure you can say that HINTS is the missing UI for pS for some on-demand metrics...
I think there 2 slightly different interfaces: I really like the quick and intuitive way of getting information you have in HINTS (or you had in pS-Lite). We did not have this. But we are now in pS implementing something in pS similar to what perfSONAR-Lite was: web interface, with simple way of doing on demand measurements and getting information.

Mario: not only a matter of lay out, or simple to install and use: but, also, in terms of metrics?

Domenico: In terms of metrics: now listing the metrics: We as pS have already in the streamline ping and traceroute. We will add them. I am not sure about the possible synergies we could put in place for ping and traceroute. We will.
About the others (besides ping and traceroute) HINTS has nmap, reverse DNS, BWCTL...
They might come in future.

The other thing I really like in HINTS is that it is so easy to install, this is something we still have to work upon. It is very easy to install the HINTS server and probes. May be there is here again room for interaction, you helping us in this sense. We need to simplify what we have there.

Mario: may be a shallow comment, but as a beta tester, beta user of both (HINTS and pS), I can only confirm what you say: it was quite demanding (at least a while ago) to install pS MPs. Installing and Deploying HINTS is very user friendly. Scripts are practical, effective. I installed it in minutes.

Domenico: your feedback as user of both system is valuable for us, helping us dropping some unrequired things... , I am not the ideal person to deal with this. I know HINTS it's very easy to install.

Mario: I am not totally up to date with pS: however I do remember some troubles with the Web interface used to configure. Sometimes they were not displaying the actual, used values. Probably you have already addressed this issue already..

I am a bit stuck with **the original reason why we called this meeting today:** there is a lot of room for trying to understand what of useful has been done in HINTS which could be contributed to perfSONAR.

I would like to ask Olivier his view on this, a confirmation: how much support would you be able or keen to provide to HINTS as such, how much he would be happy to see for example the HINTS probes "endorsed" by perfSONAR. Would you be happy to see pS acquiring some of the HINTS features? And in terms of support teams?

Olivier: let's be clear: HINTS probes are based on perfSONAR, we think it would be useful to have them integrated with them.

In fact you are right, we are a small team, and it's a part time effort, we are happy to contribute. A maximum of a week per month is what we could work on HINTS. Either alone within HINTS, or, hopefully, together with the HINTS team. Overall, in total, some manpower on the probe side, Gilian, myself. On the server side we have more difficulty to find manpower, in terms of how the situation is today.

Second thing I would like to say, we have seen that HINTS and pS are very different in sizes: HINTS cannot be compared to pS. pS can take many ideas from HINTS, I would be very glad to help. We can help, but of course the efforts are not comparable.

Domenico: in terms of resources, we should be discussing with our task leader (Jan Hertzberg/NORDUNET). There is certainly room for synergies and collaboration. But of course we need to have this confirmed from our task leader, managing our resources.

Another thing I'd like to say, from the User point of view, anything we could do to make life of both pS and HINTS users easier, I would be glad to go for. Anything we could do to make user's life easier is welcome. My perspective is purely a user perspective: I am not talking in terms of technical teams.

I think many HINTS-related things are interesting: some metrics we are currently not implementing, some procedures to speed up and improve the installation procedures, I have seen the opportunity to take some of your experience to feed it into perfSONAR. Scripts or procedures to improve the pS installation, for example, it would be nice to get some of your experience and feed it into pS.
We might also help the HINTS team, you might be interested in from the perfSONAR Side.

We are comparing a large GEANT funded activity, and an almost volunteer based activity of HINTS.
We are looking at the same communities: users: I really believe the community would welcome us to collaborate.

Olivier: one last question: I would like to know, from the User point of view, when a user is connected to perfSONAR, can he/she be seeing only some of the total set of resources?
I would like to know from the user point of view, when a user uses pS, does it have a profile.
At the moment, pS is not foreseeing different authorization levels for pS.

Domenico: not yet. No. Some of the NREN people would be very happy to have this feature.
pS users can see all.

We already got requests from some NRENs: allow people to be accessing only some regions.
In pS a user only sees the whole pool of resources. If you are part of the system, you can access everything.
Unless sites are not explicitly excluding some remote sites (within BWCTLS I can specify the NRENs which are allowed to use...) - there is a space level you have to provide. Besides that, it's up to the NRENs to use the system.

Mario: A minor point about user communities of HINTS and pS: when pS-Lite started, one idea was to give access to simple, dummy end users – Grid users – to provide them with a tool to be able to perform a first troubleshooting themselves. On the other send, perfSONAR was meant to be a bit more for expert users, network engineers.. May be user community of HINTS and PS are not exactly the same?

Domenico: Users: main pS users are NOC teams and PERT engineers. We are mainly addressing them. This is true in this sense. NOC and PERT.

Mario: To move on today: even if user communities are slightly different in this sense, I think we have to decide whether we want to dig more into the technical issues and see if/how we can come with a technical proposal about integrating the probes.

Susanne: DFN is very interested in HINTS and pS-Lite, we would like to see this endorsed and used. We are very interested. We should find out how much effort we could commit, and we will have to talk to Jan Herzberg as well. ERLANGEN would be interested in digging into it. DFN is very interested in this sense. We could dig more into this. That would be great. We would need to understand, check the available manpower and talk to Jan.

Domenico: we should try to build a bit of a wish list – may be on the pS side – what we would get. Also you could build this. HINTS also producing a wish list. Some functionality to be integrated.

Mario: How feasible is that we build a unique deployment module, a unique probe?

Domenico : having the same probes to deploy ?

Mario: yes. In my opinion this would be the real, fundamental issue to boost both, pS and HINTS, and also would allow for addressing both community of users

In my opinion one of the most important thing to understand, is how feasible, possible, desirable, is that we have a common deployment module for the probes.

Even if may be users might be different, slightly: Can we converge on a same deployment module?

Overall, we've seen that when we ask people to deploy 2 separate boxes for monitoring, we get answers like "thanks, but no thanks" – "Yet another box?"

After all, this would be really to be hoped for : with one deployment, there could be 2 slightly different user communities, troubleshooting at different levels, using the same probes, the same deployment – for now through 2 server/UI tools (HINTS and pS):

First a grid user would check if very basic metrics are working – while digging into a Grid issue ; then NOC and PERT experts could be involved in the troubleshooting process. The basic debugging is done therefore by the dummy grid end users; then NOC and PERT expert could get into the game.

Domenico: I agree with you. It would be good to converge to a unique deployment module.

I am not a tech expert in this term. We are addressing a bit different users. Our users are not end users.

Each NREN have their way to address this issue. We have to stop at the NREN border.

If this could be done, if this is compatible, for both communities, that would be brilliant.

Our (pS) users are not end users: each NREN deals with NOC and PERT issues in its way.

If this is compatible with both, pS and HINTS, this would be brilliant. I can say, if this is possible, that would be great.

Mario: Roland, do you think we could investigate this?

Roland: yes, **Olivier:** yes, that would be good. **Susanne:** I think we should try to find this out ! yes.

Roland: unique probe: I see a possible challenge here: can use case co-exist? Is there anything in HINTS
Is there anything in the HINTS configuration that would go against PerfSONAR's or not.
Using SSL connections or not. We currently do not enforce that. (and viceversa).
Potential issues are there. Anyhow we can and should try to find out.

Olivier: I would really like to have a common probe – MP. Keeping some tech differences is not important;
we can drop some of them. I won't fight for this or for that. We could discuss on this.
Main target is HINTS to live: we need access to many already installed MPs.
We have the will to go ahead on this. To be able to use MPs is very desirable.

Mario: **if I understood correctly everyone's position, there is room therefore to further technically dig into the issue of finding out if we can integrate the HINTS probes into the perfSONAR Measurement Points.** Best thing to do: sit together on the technical side and come up with an answer.
Prepare a very detailed description of the pS-MPs and the HINTS probes, and come to a common technical meeting , face to face, involving as much as we can the technical side.
After this technical brainstorming and analysis, we could have a more clear idea on this.

Olivier: Mario and myself we'll send the minutes/agreed actions, send them to the pS Team, to agree on the next steps. After we validate the summary, we can move on. We will share the common knowledge of the 2 products.

Domenico: no further comments so far. Phone call was useful.

Susanne: Can I download the HINTS probe somewhere? **Olivier:** sure, I will send you the pointer to the RPMs.

Mario: I think that there is room for trying this out. I do not see major potential obstacles so far. The devil hides in the details, of course. So we will have to see. But I see a potential benefit for the whole community and the two products.

Olivier: please send me the names and contacts of the Erlangen Team.