



20-09-2013

Deliverable D8.1 (DS4.4.1): Current Status of eduPERT community and GN3plus and SA4 T4 Activity Plan for the eduPERT community



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Contractual Date:	31-07-2013
Actual Date:	20-09-2013
Grant Agreement No.:	605243
Work Package/Activity:	8/SA4
Task Item:	Task 4
Nature of Deliverable:	R (Report)
Dissemination Level:	PU (Public)
Lead Partner:	SWITCH
Document Code:	GN3PLUS13-589-9
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The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7 2007–2013) under Grant Agreement No. 605243 (GN3plus).

Abstract

eduPERT is an open community committed to increasing the dissemination of performance expertise among NRENs, projects and campuses. This report discusses the SA4 T4 Activity Plan for engaging, promoting and expanding the benefits of eduPERT.

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Executive Summary

The main objective of GN3plus Service Activity 4 Network Support Services, Task 4 eduPERT (SA4 T4) is to establish the eduPERT team as an expert group for performance-related topics that will gather, organise and actively disseminate information on performance topics, methodologies and techniques.

An account of the present and future work of eduPERT is presented. This covers its transition from a more-or-less centralised service to that of an open community with a distributed, collaborative model of information capture and sharing.

An Activity Plan to promote the development of eduPERT has been devised for the GN3plus project. By bringing a fresh impetus to the community, it is aimed at raising awareness of this valuable resource and making a positive impact on future network and application solutions.

1 Introduction

1.1 Background to eduPERT

Performance Enhancement Response Teams (PERTs) have traditionally provided an investigation and consulting service to academic and research and experts on their network performance issues. Problems such as low throughput, slow response times, packet loss or signal degradation are often dealt with through standard IT support channels, or by the university's or the National Research and Education Network's (NREN's) PERT. To diagnose problems, a PERT must consider the complete end-to-end path, so one of the main functions of a PERT is to question end users, system administrators, and network operators who have systems on that path.

eduPERT was formed from local PERT teams (most NRENs have their own teams) with the main purpose of the service being to troubleshoot performance issues on the GÉANT backbone as they occurred. At first, this was a centralised service, staffed by a duty Case Manager provided by each NREN and serving for one week at a time, in rotation. This service was initially successful in presenting a very active and strong community with many solved cases and shared solutions. During the last years of GN3 though, eduPERT involvement declined somewhat, with less contact between users taking place and with fewer cases being registered. Whether this was the result of fewer problems and a more reliable network service, or a decline in community involvement is an open question.

With ever-changing technologies, protocols and user requirements, teams still need access to the latest information, tools and experience from other experts. This is why, within the GN3plus project, the service has been reshaped as a knowledge and support community to form the current eduPERT structure.

1.2 Current Status of eduPERT

SA4 Task 4 is charged with investigating the current and future needs of the eduPERT community, with the aim of reinvigorating it by using a more distributed, collaborative model. It was hoped that this more 'open' approach would capture the worldwide in-depth expertise of its practitioners more satisfactorily.

eduPERT is more active now (after Q1 of GN3plus) than it has been during GN3. It has gone from a low point where there was no community activity and no people involved, to having a small but stable core group of 10 experts who provide energy to a growing community that extends beyond GÉANT and Europe. At the time of publication, the eduPERT mailing list has 109 registered participants, with more than 30 new users registered

in the last four months. The activities considered within the eduPERT task and described in this document promise a far larger outreach for the task.

1.3 Benefits of eduPERT

eduPERT membership is not limited to NRENs: Universities, international projects and other organisations are encouraged to join, by setting up 'local' or 'project' PERTs, and participating as users and contributors to the eduPERT Knowledge Base. The eduPERT members benefit from:

- A stronger, more diverse, multi-disciplinary and stable community.
- Collaboration with other members in troubleshooting.
- The experience of performance experts through the sharing of knowledge and expertise via monthly calls and the Knowledge Base.
- Established international cooperation with different organisations such as: Internet2, ESnet and the Research and Education Advanced Network in New Zealand (REANNZ), etc.

eduPERT's area of interest extends beyond the physical network by also working closer to the end user and the end point. It encompasses new technologies – such as high-speed diverse traffic profiles, cloud storage and data centres – which can have the effect of increasing the complexity of performance understanding and diagnosis.

1.4 eduPERT in the Future

Within the life of the GN3plus project, the aim is to:

- Strengthen the existing approach which is proving successful at the moment (with monthly calls and community meetings held at key conferences such as TNC).
- Invest more in Performance U!, workshops and training activities.
- Approach communities of end users rather than try to reach individual end users.
- Investigate a pilot scheme for one or more workshops (e.g. the EGI Technical Forum) as a means to reach out to other communities. The number and frequency of workshops would depend on demand from users and the availability of funding.
- Invest more in international outreach. An open community needs to seek out collaborations beyond Europe: for example, a visit to Australia and New Zealand by the Task Leader is planned. The USA (where performance activities in ESnet, Internet2 and many research environments are very active) and Japan will be important outreach targets.

The strategy is for eduPERT to change into a fully open community of specialists that aims to develop new and highly effective performance experts.

2 Activity Plan for eduPERT

The Activity Plan seeks to strengthen some existing (GN3) efforts and introduce some new means of outreach.

The Community meeting at the TNC2013 Conference provided a forum for discussing ideas for the development and expansion of eduPERT. The eduPERT strategy is being implemented on several fronts: a continuing series of monthly conference calls; a specialist knowledge base, web portal and mailing list; and an annual school and a workshop.

The plan also includes a new element – outreach activities – aimed at extending participation beyond Europe and the existing GÉANT network. eduPERT has been recognized by NA4 T1 as an area of interest for other communities outside GÉANT and it has become part of NA4's strategy to promote the concept of eduPERT and to share our best practices with other communities. Outreach has only just begun, and SA4 T4 is seeking to invest more effort and resources in this area of activity.

The elements of the Activity Plan are described in sections 2.1 to 2.8, below.

2.1 eduPERT Community Meetings

The plan is to have one community meeting per year. For 2013, a meeting was planned for M5 according to the project Milestone MS71 and was held to coincide with TNC2013.

The TNC2013 Conference 'Innovating Together' took place from 3 to 6 June 2013 in Maastricht, the Netherlands. The Activity co-hosted a working lunch on 6 June from 12:45 to 14:00 [eduPERT_TNC13], which presented an ideal opportunity for outreach and community interaction, and to show the new organisation and energy within the open eduPERT community.

The meeting provided an opportunity to discuss the future needs and the style of collaboration best suited to such an open group, and to share ideas about how to reach out to and involve more end users.

Meeting face-to-face in this way is a key event for the eduPERT community and it will be repeated in Y2 of GN3plus.

2.2 eduPERT Monthly Calls

A monthly conference call among interested eduPERT members has been a key feature of the Activity Plan since November 2012. An agreed-upon date towards the end of each month is chosen and an agenda is distributed in advance.

The call itself allows the sharing of news and findings (which may find their way to the Knowledge Base). Recent calls have allowed a 'virtual workshop' where a measurement tool has been installed during the call, allowing the pitfalls and results to be discussed 'live'.

Although precise dates have not been fixed in advance, to retain flexibility, regular eduPERT monthly calls have been scheduled for the duration of the GN3plus project.

2.3 eduPERT Knowledge Base

The Knowledge Base (KB) [eduPERT_KB] is a public Wiki hosted by SWITCH that acts as a repository for useful information on optimising network performance, particularly that of research networks. For ease of navigation, the PERT KB is organised in five categories:

- Network (network metrics, protocols and tuning).
- End host (application protocols, host tuning, virtualisation).
- Tools (PERT tools, NREN tools and statistics and network emulation).
- General knowledge (user-perceived performance, performance metrics, etc.).
- Performance case studies (sharing PERT solutions, etc.).

The Knowledge Base will continue to be used and enriched with new content throughout GN3plus.

2.4 eduPERT Portal

The eduPERT portal [eduPERT_Web] is an actively maintained website that hosts many topics of interest for PERTs and anyone interested in performance enhancement. It has proved to be very useful and will be used throughout GN3plus. The portal makes a number of central services available to the independent PERTs, including registration, arranging eduPERT meetings, making the Knowledge Base and related documents available, and maintaining the directory of PERTs in the eduPERT federation.

2.5 eduPERT Mailing List

An active mailing list (pert-discuss@geant.net) is maintained by the Task Leader. The mailing list is open to anyone who wishes to keep up-to-date on the topic of network performance. The list has grown by 38% in the

last four months since the beginning of GN3plus and it will be enlarged further as future educational and outreach activities begin to take effect.

2.6 Performance U! Annual School

A 'pilot' Annual School took place at SWITCH, Zurich, Switzerland, as part of the eduPERT Performance U! project [PerfU]. ('Performance U!' stands for Performance University.) The inaugural Annual School, which was funded within GN3, took place from 6 to 8 March 2013. Eleven presentations by invited speakers were given, on topics ranging from TCP performance, investigative and monitoring tools, virtualisation, OpenFlow and multipath TCP over SDN, together with a range of case studies and expert reports [PerfUagenda].

The first Annual school had 19 attendees from a wide range of institutions [PerfUattendees]. The success of the pilot Annual School - measured by the enthusiasm and positive comments received from participants and the fact that many of them are now active within the eduPERT community - encouraged the eduPERT team to propose using this format in the GN3plus project.

2.7 eduPERT Workshop

The workshop format is a pilot study for the effective delivery of information about network performance (i.e. monitoring, troubleshooting, measurements and optimisation). After evaluating the outcomes of the first workshop, the format is likely to be repeated, if successful. All training activity (particularly the workshop) is considered to be an important outreach opportunity.

The first GN3plus eduPERT workshop is scheduled to take place at the EGI Technical Forum on 18 September 2013 (see Section 2.8). The training agenda has been accepted by the EGI organizers and is now publically available [EGI_Forum].

2.8 Outreach Activities

Outreach activities will be planned and carried out in consultation with Activity NA4 (International and Business Development) and aligned with their strategy. The first four outreach meetings planned represent an excellent outreach opportunity for both GÉANT and eduPERT:

- **REANNZ.** The Research and Education Advanced Network in New Zealand [REANNZ]. eduPERT has been invited to hold a training workshop on performance for its engineers on 27 and 28 July 2013. Immediately after the training and together with the REANNZ engineers, a workshop on performance will be held at the eResearchNZ conference.
- **AARNET.** The Task Leader of eduPERT will give a presentation at the QUESTnet (Queensland Education, Science and Technology Network) 2013 Conference and also host a working lunch at the same event. The main purpose for eduPERT is to establish collaborations with AARNET (Australia's Academic and Research Network).

- **EGI.** The European Grid Infrastructure [EGI] is an example of a thriving end-user community. The EGI Technical Forum [EGI_TF2013] will take place at the Meliá Castilla Convention Centre in Madrid, Spain, from 16 to 20 September 2013. An eduPERT workshop has been accepted and scheduled with the EGI organisers [EGI_Forum].
- **RNP.** The Rede Nacional de Ensino e Pesquisa [RNP] is the Brazilian NREN. They already participate in the eduPERT monthly call and plan to establish their own eduPERT community. Depending on the budget and resources available, their future target is to bring eduPERT knowledge and expertise to South America.

Other outreach activities will be planned in collaboration with Activity NA4, and based on their strategy of encouraging growth in traffic flow between certain partners and other development projects.

3 Conclusions

Some of the technical issues of optimizing traffic flow or dealing with performance loss can be extremely subtle and they are likely to fall outside the experience of almost all PERT members. It is only by sharing very particular knowledge and exchanging information in this collaborative model that solutions and best practices can be implemented efficiently across GÉANT.

Task priorities have been allocated using the experience of the eduPERT moderators and active participants and feedback from the wider PERT community, within the limits set by the available resources (i.e. manpower and travel budget).

Planned eduPERT activities range from steady engagement (such as maintaining and extending the Wiki, Web portal and Knowledge Base, and enlivening the community via monthly conference calls and regular mailings) through to interventions such as presentations, workshops and annual schools. Since the interest in eduPERT and the acceptance of its concept and results has exceeded the initial scope for the eduPERT task, some effort can be expended on new activities, such as assisting NA4 T1 in broadening participation beyond Europe and the existing GÉANT network.

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[REANNZ]	http://reannz.co.nz/
[RNP]	http://www.rnp.br/

Glossary

AARNET	Australia's Academic and Research Network
EGI	European Grid Infrastructure
EIROforum	Europe's Intergovernmental Research Organisations Forum
ICT	Information and Communications Technology
KB	Knowledge Base
NREN	National Research and Education Network
OGF	Open Grid Forum
Performance UI	Performance University
PERT	Performance Enhancement and Response Team
QUESTnet	Queensland Education, Science and Technology Network
R&E	Research and Education
REANNZ	Research and Education Advanced Network in New Zealand
REN	Research and Education Network
RNP	Rede Nacional de Ensino e Pesquisa, the Brazilian NREN
SA	GN3plus Service Activity
SA4 T4	SA4 Network Support Services, Task 4 eduPERT
SDN	Software Defined Network
TCP	Transmission Control Protocol
TNC	TERENA Network Conference