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Deliverable D11.4 (DS7.5.1,2): Review of Y2, Task 5: Mobile Data Service Activities and Achievements

Abstract

This report presents an update of the work carried out and achievements made during Y2 work of GN3plus SA7 T5, which provides the NRENs with the opportunity to aggregate demand and engage effectively with mobile providers to procure mobile telephony and data for end users at significantly lower costs.

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Executive Summary

This report presents an update of the work carried out and achievements made during the second year of GN3plus Service Activity 7 Support to Clouds (SA7), Task 5 Mobile Data Service (T5).

Task 5 provided NRENs with the opportunity to aggregate demand and engage with mobile providers to procure mobile telephony and data for end users at significantly lower costs, as current mobile services provided by commercial providers in many countries do not offer sufficient value for Research and Education (R&E).

This Task assisted the NRENs in working together and aggregating scale and expertise to make these services available, across borders.

Considering mobile services are unchartered territory for most NRENs, Task 5 opted for a phased, step-by-step approach and organised procurement in an initial set of five countries, representing an interesting geographical range in terms of target audience size, while still manageable from a project perspective. The outcome of this 'first wave' could be used for follow-up activities; to take the learnings and adjust the course when needed.

In order to attract as many providers as possible in this procurement, the NRENs opted to seek one (existing) MNO provider per country, and not seek a single provider to offer these services in all countries, as research indicated that this was not realistic.

In December 2013, five NRENs in the Czech Republic, Netherlands, Portugal, Spain, and Sweden, signed up for the mobile data procurement. The remainder of Year 1 was used to generate provider interest in these countries by issuing a formal Prior Information Notice (PIN) and RFI and by direct contacts with all active providers in these countries.

In Year 2, the procurement process encountered serious setbacks as provider interest diminished and, in most countries, was unable to procure the intended services. This document describes the different phases and the mitigation taken to increase the chances of offers becoming available in at least two countries. It also details the cause of the lack of provider interest and the 'lessons learned', which are already showing value in new initiatives.

The lessons learned are being applied in other service delivery efforts, for cloud services. The outcomes also made it clear the NRENs should improve their position in the mobile domain, to have more leverage when interacting with suppliers in the future. Therefore, Task 5 formed a global coalition of NRENs that is now collaborating in this area and aims to obtain a dedicated mobile network code (MNC) for Research and Education use at the ITU. Task 5 fosters strong collaboration between NRENs, within GÉANT and on a global scale. This, combined with the mobile service 'playbook' now in place, assists both present and future service delivery.

1 Introduction

The research and education community is increasingly "cutting the cord" and making choices that favour wireless technology. Research and education users are rapidly adopting mobile devices and a nomadic work style, both on and off campus. Such users want to be online anytime and anyplace. However, the current mobile services (3GP; 3G and 4G services) provided by commercial providers in many countries do not offer sufficient value compared with their cost: subscription costs are too high, data bundles (i.e. the data traffic permitted) are too low, and the mobile services are not connected to the research and education IT infrastructure. Vendors struggle to cope with the rise in data traffic and to make the required investments in next-generation infrastructures. Regulatory bodies find it difficult to create a more competitive market and drive innovation forward. This limited and fragmented experience impedes the research and education community in its work.

To meet the users' needs and push the boundaries of technology, NRENs are working together to remove these barriers and provide an attractive and seamless mobile experience to the research and education community. The shift to more nomadic working by staff and students increases demand for mobile connectivity. The work of SA7 Task 5 provided NRENs with the opportunity to aggregate this demand and effectively engage with mobile providers to procure mobile telephony and data for end users (staff and students) at significantly lower costs. Within the GN3plus timeframe, SA7 Task 5 facilitated the procurement of mobile services for a first wave of five participating NRENs (Czech Republic, Netherlands, Portugal, Spain and Sweden), representing a joint user base of 3.2 million users.

This document (Deliverable) provides a snapshot of progress and status of this new Activity and Task, at the end of the GN3plus project. It outlines the steps taken in the second year, details the probable causes of the limited result and summarises the lessons learned.

2 NREN Collaboration on Mobile Services

2.1 Landscape at the Start of Year 2

SA7 Task 5 provided NRENs with the opportunity to aggregate demand and engage with mobile providers to procure 3G and 4G mobile telephony and data for end users at lower costs. Current mobile services provided by commercial providers in many countries do not offer sufficient value for Research and Education (R&E).

The initial planning and timeline for SA7 Task 5 (defined in the Description of Work) continued the approach taken in GN3 and was based on the outcomes of the Analysys Mason report, which concluded:

- The size of the combined NREN community warrants a significant discount on 3GPP (ITU terminology for voice and 3G/4G) services).
- The expected procurement costs are negligible in comparison to expected savings.

In December 2013, five NRENs, (those in the Czech Republic, Netherlands, Portugal, Spain, and Sweden) signed up for the mobile data procurement. The first year focused on:

- Defining the approach for the Task and Procurement.
- Discussions, within the team the GN3plus project management, product management and Services Advisory Board, about the Task direction and topic approach.
- Gathering a first wave of five participating NRENs.
- Preparing the procurement.
- Soliciting interest from providers.

The SA7 Task 5 team updated a timeline based on the outcomes of Step 1 (Milestone MS95 (MS7.5.2), Advice for Procurement and Exploitation Roadmap), which included the end of the RFP stage at end-2014.

Figure 2.1: Task 5 timeline

At the start of Year 2 there were 18 registrations of interest (bidders accessing the RFI document). The team expected additional interest, as the RFI was open until May 2014.

2.2 Year 2 Results

2.2.1 RFI Outcome

During the Request for Information (RFI) stage, the participating NRENs were in direct contact with the providers in each of their countries to explain the task and promote the opportunities it could create.

By the close of the RFI stage, where providers had to register to participate in the following RFP phase, there was much less interest than anticipated. In one country (Czech Republic) no provider registered, and in other countries between one and three providers registered. Although the participants contacted their respective providers (who had shown interest but had refrained from registration), no additional providers registered.

2.2.2 Draft RFP

Following the disappointing RFI outcome, the team formed a small working group to create a balanced Draft RFP document, which would serve as a basis for the discussions in the Dialogue Sessions with the providers. The objective was to get feedback on our requirements during the subsequent Dialogue Sessions to ensure that the Final RFP would meet provider capabilities while maintaining the needs of users within the Research and Education domain. The draft RFP was sent out at the end of July.

2.2.3 Dialogue Session

In September, there were two Dialogue Sessions planned with the remaining providers. They gave valuable insight in the limitations and possibilities of the providers. Unfortunately, the Portuguese provider withdrew just before the first planned Dialogue Session, and the Spanish provider withdrew during the Dialogue Session.

2.2.4 RFP

To be able to focus on the specific possibilities and differences in planning in the remaining two countries, the team decided to first issue a separate RFP for the Netherlands, This was issued to the two remaining providers in the Netherlands on 29 October 2014. During the bid submission period, one of the providers pulled out of the process, stating its inability to make offers available before at least November 2015 (as opposed to April, as stated in the RFP). The other provider submitted a bid that was rejected, due to not meeting the minimum criteria:

- **No communication efforts were planned**. There was a lack of any planned dedicated effort by the provider, to show and promote the offering to the Research and Education community.

- **Only a small discount was offered**. The offer was constructed in a way to look like the company offered substantial discounts, however, a closer inspection revealed that prices matched regular retail subscription costs.

2.2.5 Post-RFP

The Netherlands
The procurement for the Netherlands was declared unsuccessful, with no acceptable bids. Direct negotiations were undertaken as a result. At the time of writing (March 2015), there are discussions with the provider who withdrew from the process (stating inability to make offers available within the requested time-frame), about a comparable service offering at the end of 2015.

Sweden
Considering the outcome in the Netherlands, it was decided in January 2015, that open negotiations would provide a greater chance of success than issuing a formal RFP. These negotiations are ongoing at the time of writing.

2.2.6 Provider Interest Over Time

The table beneath shows the provider interest during the different phases of the project.

Stages	Czech Rep.	Netherlands	Portugal	Spain	Sweden	DANTE
Stage 0 PIN Dec 2013/ Jan 2014	No response from providers	No response from providers	No response from providers	No response from providers	No response from providers	No response from providers
Stage 1 contracting providers ourselves, Feb-April 2014	Three providers show initial interest	KPN and T-Mobile show initial interest	Three providers show initial interest	Three providers show initial interest	Three providers show initial interest	Vodafone international declines role
Press releases seeking additional provider interest, April 2014		1 extra providers, Tele2 contacts NL team				
Stage 2, RFI closing, May 2014	No providers registered	KPN, T-Mobile and Tele2 register	MEO registers	Telefonica registers	Tele2 registers	
Stage 3: introductory VCs, June-July 2014		KPN, T-Mobile and Tele2 remain interested	MEO remains interested	Telefonica fronts it's MVNO Tuenti to participate	Tele2 remains interested	
Stage 4: issuing lightweight and transparent draft RFP, July 2014		KPN withdraws	MEO remains interested	Tuenti shows little commitment	Tele2 remains interested	
August 2014			MEO withdraws			
1st Dialogue session, Sept 2014		Tele2 attends, T-Mobile wants to attend 2nd session only		Tuenti shows interest, warms to project, sees opportunities	Tele2 asks marketing effort / added value	
2nd Dialogue session, Sept-Oct 2014		Tele2 and T-Mobile attend dialogue session		Tuenti withdraws	Tele2 asks marketing effort / added value	

Stages	Czech Rep.	Netherlands	Portugal	Spain	Sweden	DANTE
RFP phase		Initiate direct negotiations with Tele2 after receiving no valid bids			Initiating direct negotiations with Tele2 considering NL outcome	

Table 2.1: Provider interest at each stage of the process (Year 1 and Year 2)

2.2.7 Results in Ireland

The Irish NREN, HEAnet, has been offering significantly discounted data-only subscriptions since 2008. HEAnet was a member of the core Task 5 team, but was not able to align its re-procurement of these services with the Task 5 planning, as it needed the services to be available by the beginning of the academic year in August 2014. HEAnet's best practices (approach, procurement form and requirements) formed the basis of the Task 5 procurement.

Because it needed the services earlier than would have been possible with the task, HEAnet ran a separate procurement to Task 5 but used the same objectives/sought similar outcomes. HEAnet invited the Task 5 Task Leader to participate in its procurement, and attended the Dialogue Sessions. This provided valuable insights for all involved.

HEAnet managed to include a voice and data offer, although this was not as advantageous as hoped. The results, however, are very much in line with the objectives of Task 5.

Figure 2.2: Results of the HEAnet mobile procurement

2.3 Efforts Taken to Mitigate Against Low Provider Take-up

As soon as it became clear that provider interest was much lower than anticipated, the team and the participating NRENs worked together to try and retain the remaining providers. Among the actions were:

- Remove the initial requirement of a minimum 20% discount.
- Seek insights from Gartner analysts about the mobile provider market.
- Conduct one-on-one VCs with all providers to further explain the objectives.
- Shift focus to larger data bundles and measures to prevent subscriber bill-shock.

2.4 Lack of Market Interest: Mobile Operators and NREN Perspective

Providers that backed out of the process were asked for the reasons for their withdrawal. Their arguments were similar in all countries. The top-three reasons for withdrawal are given below, complemented by the perspectives of the Task 5 team.

Provider Reason 1: Discounts sought for subscribers were too high

From the beginning, NRENs decided that it was only worth doing this project if significant savings could be realised. This was due to:

- Conclusions in the GN3 Analysys Mason report forecasting up to 40% achievable savings.
- NRENs do not usually consider brokering mobile services as part of their core activities. The NRENs decided that a significant end-user saving had to be realised for them to do so.

The provider interactions during the Dialogue Sessions made it clear that the large mobile operators watch their competitors closely and will only take small steps to change their product offering, after others in the market.

The Task 5 team experienced quite different responses from the incumbent providers (with large market shares) than from the smaller ones.

During Year 2, the team and the participants decided to remove the initial minimum discount of 20%, and instead used 'a significantly better offer on data bundles'.

Provider Reason 2: Data bundles currently offered are large enough

Providers stated their current data-bundle offers are large enough and sufficient for users' requirements. Interestingly, average consumption of data varied largely per country, ranging from 200MB to 1 GB between the five countries. The team expects that this variation is largely due to:

- High costs charged for the bundles.
- Costs incurred to subscribers when exceeding the bundle allowance.
- Combined with the conservative nature of the providers, in changing offers.

HEAnet's experience of offering large data bundles at limited cost for the last six years, confirms these assumptions. Unimpeded Irish student data consumption grew 40% on an annual basis to 12GB per month in early 2014.

Provider Reason 3: Student offers are already available

Many providers do offer slightly discounted offers to students. But these:
- Did not include larger data bundles compared to existing offers.
- Did not protect subscribers against high costs when exceeding the bundle limit − standard (more expensive) costs for voice or data consumption were charged.

3 Lessons Learned

3.1 Procurement Lessons

There were a number of key lessons learned during the project.

Procurement from the five countries was unsuccessful because:

- The GN3 Analysys Mason report used as a baseline predicted discounts of 20% to 40%, which was too optimistic.
- NRENs lack a track-record in procuring / delivering mobile services.
- There was general difficulty in attracting potential suppliers:
  - NRENs could not offer a minimum number of subscribers to guarantee revenue for the providers, which halted progress on the offer.
  - NRENs failed to convince providers of the advantages that could be gained by offering students access to larger data bundles.

The communicated advantages were:

This opportunity will enable mobile operator(s) to:
- Reach the education domain, through the NRENs.
- work more closely with education and research networks on areas such as identity management and Wi-Fi/4G interworking, which, in turn, will bring cost efficiencies for the mobile operator and a greater overall customer experience.

There were a number of additional benefits for the mobile operator, including:
- PR opportunities for the mobile operator to publicly support education and research in the relevant countries (demonstration of good corporate citizenship, etc.)
- Opportunity for the mobile operator to build brand loyalty with a young, highly educated and future high-earning market segment.
- Access to the NREN federated authentication system will enable the mobile operator to reduce costs by validating student users for the upcoming academic year online, while also ensuring a student can only take-up the offer once.
- Facilitation from NRENs to provide the mobile operator with a local contact at each higher education campus to facilitate promotion of the offer on the higher education premises.
- Building a closer relationship with the NREN and higher education colleges may lead to future collaboration on possible joint trials and research projects.

- Ability to validate users as students (within their current academic year) via federated authentication will enable the mobile operator to target students with other offers and promotions.
- Opportunity to accurately determine usage patterns for the student market segment.
- Opportunity to test new offers and services on a large user base.

The mobile provider market is not accustomed to giving the level of discounts sought by the NRENs.

Contributing factors to the success of the HEAnet procurement included HEAnet's proven track record and established presence delivering these services, which has helped during the renewal process.

If NRENs are not known players in these markets and cannot deliver a guaranteed subscriber base, they should not use traditional procurement and tender methods, in which provider interactions are limited. *Instead, NRENs should flip the approach and use mobile provider procurement only after clear service definition, indicative subscriber uptake (on an NREN-brokered service), and Dialogue Sessions with providers have established a better understanding of needs and capabilities between the supply and demand side.*

Traditionally, procurement is an abstract process in which communication with suppliers is very limited. Experience in GN3plus show that this traditional approach did not match:

- The requirements from the NRENs, which were outside the scope of providers' typical offers.
- The providers' capabilities and willingness to meet NRENs' needs.

The considerable gap between the supply and demand side and the tender approach limited the scope for discussion and negotiation.

If procurement supports and follows the dialogues with the providers, there is a greater chance for success. *The frequent contact with providers should be carried out during the initial stage of the process and focus on two things:*

- Selling our users' requirements: why providers should participate.
- Listening to providers' abilities and constraints: what they can and cannot do.

This should guarantee that the tender document does not come as a surprise and is a better match to providers' abilities, while setting a high minimum standard of service, and ensuring that the offer matches the project's needs.

In addition, the project was severely handicapped as soon as it became clear that only a few providers had registered. As the team had opted to follow a traditional procurement process, it was unable to include providers that had not registered.

It is also clear that *the initial starting point of asking providers for a minimum discount of 20% was not only unrealistic, it discouraged providers.*

Although there is limited market research available (even established organisations such as Gartner could not provide any advice), *more time should have been spent talking to providers before starting the procurement process.*

The fact that there had never been any international procurement for mobile services run on this scale, also did not help the process. There was no reference procurement to learn from. Providers also found it difficult to put the right team together to address this procurement, as it fell between consumer and enterprise solutions. Consumer subscriptions were targeted, but the scale and process required an enterprise approach and knowledge of tenders.

The results of SA7 Task 5, including the RFI and RFP documents, can be used for future interactions using this more balanced approach.

These lessons are already being applied within GÉANT in the SA7 Task 6 Procurement for Cloud Services, IaaS offerings.

3.2   The Bigger Picture

From the start of the process, it was understood that even with considerable efforts, a 'mobile push' requires multiple attempts. Building a sustainable model and commitment to requirements takes perseverance. At the same time, the team believed that the potential savings for students were significant and could be extremely valuable, which provided a good starting point.

Through Task 5's initial approach with five countries, valuable lessons have been learned on how to approach and engage with suppliers. A suitable model for subsequent supplier engagement and procurement activities has also been found and is being applied. Although the mobile project has not yet led to concrete savings for students, negotiations are still ongoing in two countries. This project has helped us 'to get into the game' and gain essential experience. Furthermore, lessons learned have been applied to our work with suppliers of cloud services.

3.3   Global NREN Mobile Coalition: Towards a Mobile Network Code for Research and Education

The SA7 Task 5 outcomes show that to be successful in the mobile domain, and provide better mobile services to the Research and Education community, NRENs need a sustained effort, through a strong visible coalition. In addition, many mobile operators are large, global players that do not welcome change. As a result, in addition to the work on the tender, Task 5 worked on establishing a worldwide collective of NRENs to:

- Collaborate on a joint mobile approach, beyond Europe, on a global scale.

- Work towards a concrete common goal: to obtain a international mobile network code (MNC) at the ITU (as part of the ITU's international identification plan for public networks and subscriptions [ITU212]. The idea for such a mobile network was a collaboration between SA7 T5 and the GN3plus Open Call Project MEAL.

A mobile country code (MCC) is used in combination with a mobile network code (MNC) to uniquely identify a mobile phone operator. The ITU-T Recommendation E.212 defines mobile country codes as well as mobile

network codes. A total of 100 MNCs can be associated with every MCC. This limitation makes it a scarce resource within each country (a number of countries have requested multiple MCCs for this reason). The international mobile network code (or 'Shared Country Code' = MCC (number 901) + MNC) is one that is not assigned to a specific country but can be used globally.

A dedicated international mobile network code for the R&E community (an MNC for R&E), would allow NRENs to:

- Issue their own SIM cards.
- Offer international access via 3G and 4G networks.
- Connect mobile networks to fixed infrastructures while charging users' local traffic.

This would benefit the Research and Education community in a number of ways. An MNC for R&E would:

- Give users access to their NREN/Institution network from anywhere in the world at local tariffs.
- Expand the international eduroam experience from Wi-Fi to multi-region 3G and 4G networks.
- Allow mobile data to be transported over the NREN backbones, increasing value to institutions and stakeholders.
- Allow the SIM to be used for more secure login to both Wi-Fi and to federated applications, access to rooms, student IDs, indoor GSM.
- Make it unnecessary for users to replace their SIM card when another mobile network operator is selected to carry the signal in that country.
- Make the Internet of Things and mobile sensory networks much easier to operate, as a change of mobile operator no longer requires SIM card swaps in those devices.
- Bring leverage and buying power to drive down subscription costs, preferably using models that aggregate demand and use (centralised) procurement across different countries: beyond and above a single-country-level.
- Establish a recognisable, global brand (such as eduroam).

3.3.1   Obtaining an MNC for R&E

As mentioned, Mobile Network Codes are issued by the ITU and the conditions for granting such a code are strict. A broad interest and political lobby is required to:

- Propose the concept of an NREN / R&E code for a vote at an ITU assembly.
- Achieve a majority vote from the country delegates.

This requires a worldwide NREN coalition. Specific challenges within such lobbying include:
- Suggest the proposal for voting at an ITU session:
- Lobby national governments beforehand (which requires a political and not a technical effort).
- Clearly describe the benefits to encourage government and ITU support.

Furthermore, there are challenges with respect to mobile operators.

- What are the benefits for providers?

NRENs should 'bring the users', bring volume and coordinate uptake: be the service delivery vehicle.

3.3.2 Setting up a Coalition

During the last months of GN3plus, SA7 and the GÉANT (GN3plus project) management promoted the concept of a global NREN coalition by presenting the opportunity at the global NREN CEO Forum [CEOFORUM]. This collaboration involves NRENs from around the world.

There was support in this group for the proposal, which lead to the formation of a task force that will work together on the mobile approach and a feasibility study on an iMNC for R&E. This group involves the following NRENs:

- CERNET (China)
- CUDI (Mexico)
- Internet2 (United States of America)
- NORDUnet (the Nordic countries) – part of SA7
- SURFnet (the Netherlands) – part of SA7
- AARNet (Australia).

4 Conclusion

Task 5 provided NRENs with the opportunity to aggregate demand and engage with mobile providers to procure mobile telephony and data for end users at significantly lower costs, as current mobile services provided by commercial providers in many countries do not offer sufficient value for Research and Education (R&E).

The procurement process in the five participating countries did not result in the provision of services. There were valuable lessons learned from the experience:

- The mobile provider market is conservative and closed to new providers, and not accustomed to giving the level of discounts sought by the NRENs.
- Clear service definition and indicative subscriber uptake (on an NREN-brokered service) are essential preparation for any future NREN mobile provider procurement.
- More time should be spent talking to providers before the start of any procurement process, this should be carried out during the initial stage of the process.
- Dialogue Sessions with providers established a better understanding of needs and capabilities between the supply and demand side. Such sessions form an essential part of the process.
- Task 5, including the RFI and RFP documents, can be used for future interactions, and will ensure a more-balanced approach to future endeavours.

The procurement was devised as a direct route to the end-goal of lower-cost mobile provision, but turned out to be a first step, to get into the game. A sustained effort will be needed for NRENs to become relevant in this domain.

Task 5 has opened up those new roads, through a global NREN coalition, that will bring more aggregated scale and expertise and will help to better position and equip the NRENs, including a dedicated international Mobile Network Code for the Research and Education community.

Appendix A Communication

Considering mobile services are a new topic, the team has actively communicated with the NREN community about the opportunities offered by SA7 Task 5.

During the second year of GN3plus, the SA7 team:

- Held regular update meetings with the GÉANT Limited Partner Relations team to establish a good information exchange with the NRENs about the developments.
- Informed (participating and non-participating) NREN senior management during the TERENA Networking Conference 2014 about the progress.
- Presented on T5 task and progress during two TERENA TF-MSP (Management of Service Portfolios) meetings.
- Presented on T5 during the NORDUnet conference in Uppsala, Sweden.
- Presented on T5 during the SURFnet customer days, Noordwijk, Netherlands.
- Created a memo describing T5 challenges and setbacks for the GÉANT project management and discussed mitigation measures and next steps during VCs.
- Presented the results and next steps at the GN3plus Symposium, in February 2015, in Athens.

References

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Glossary

3G	Third generation mobile communications technology
3GP	(3GPPfile format) Defined by the Third Generation Partnership Project (3GPP) for 3G UMTS multimedia services
4G	Fourth generation mobile communications technology
End-users	Higher education students and academic / institution staff
GN3plus	(GÉANT Network 3 plus), a project part-funded from the EC's Seventh Framework Programme under Grant Agreement No.605243
ITU	International Telecommunication Union
MCC	Mobile Country Code
MNC	Mobile Network Code
MNO	Mobile Network Operator
MOOC	Massive Open Online Courses
NREN	National Research and Education Network
PIN	Prior Information Notice
R&E	Research and Education
RFI	Request For Information
RFP	Request For Proposal
SA	Service Activity
T	Task
TNC2014	TERENA Networking Conference
VC	Videoconference