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## **Deliverable D3.1**

### **NREN Satisfaction Survey**

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#### **Abstract**

This deliverable presents the results and analysis of the fifth NREN Satisfaction Survey conducted in March 2017, covering the GÉANT organisation, the GN4-2 project, GÉANT network operations, the GÉANT service portfolio and GÉANT collaboration and community activities. The survey objectives were to assess satisfaction with GÉANT's activities; assess the importance of and satisfaction with specific aspects, products and services; help GÉANT better understand the community's needs; and determine how and where to focus efforts in the future.

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## Executive Summary

The 2017 National Research and Education Network (NREN) Satisfaction Survey, carried out and managed by GN4-2 Networking Activity 3 Partner, User and Stakeholder Relations, Task 1 European and Global NREN Account Management (NA3 T1), was the fifth in the survey initiative that began in 2012. The objectives of this and previous NREN Satisfaction Surveys were to assess satisfaction with GÉANT's activities; assess the importance of and satisfaction with specific aspects, products and services; help GÉANT better understand the community's needs; and determine how and where to focus efforts in the future. The survey covered the GÉANT organisation, the GN4-2 project, GÉANT network operations, the GÉANT service portfolio and GÉANT collaboration and community activities.

As in the previous year, the survey was open to all interested parties in the GÉANT community and was widely promoted via multiple channels, which boosted the response rate significantly, by nearly 50%. Overall, 73 individuals from 34 of 39 NRENs opened and answered the survey, compared to 49 completed responses from 33 different NRENs in 2016. This response rate illustrates strong support for and appreciation of the inclusive approach initiated in 2016 and continued in 2017.

Overall, there was a high level of satisfaction throughout, with only slight changes compared to the previous year. With a slight decrease in excellence ratings, in general the views were quite consistent across the community.

Specific highlights include:

- Services: Increased level of satisfaction with perfSONAR and Multi-Domain Virtual Private Network (MD-VPN).
- Project: Improved rating for project management.
- Events: Success of the new Digital Infrastructure for Research (DI4R) event.
- Organisation: The GÉANT organisation is meeting its users' demands.
- Services portfolio: The GÉANT service portfolio is meeting current and future needs.

Areas where work is needed include:

- GÉANT Testbed Service.
- Service portfolio: Raising awareness of the services available, particularly security services and eduOER, providing up-to-date and complete service information for the entire portfolio, and making it easily accessible.
- Being more transparent about work distribution between NRENs in the management of the project.
- Meeting the needs of NRENs who require support for national promotions.

- Being more accessible for NRENs and strengthening the single point of contact.
- Meeting the demand to address network security issues.

The results of this survey are being shared with the entire community, and will feed into the wider intelligence-gathering activities of NA3.

While the results show that constituents are in general satisfied, there is little or no room for GÉANT to “rest on its laurels”; users’ needs must be constantly monitored and relationships nurtured. Accordingly, based on the results and stakeholder feedback, improvement plans are being developed. Concrete actions being planned include:

- Prepare complete, up-to-date and tailored product marketing material for the entire service portfolio.
- Strengthen NA3 T1 as a single point of contact.
- Develop a national NREN support model that can be adapted to different NRENs.
- Implement a General Assembly “ambassador” initiative.
- Develop a unified communications model for the community.

The Satisfaction Survey, like NA3’s work in the GÉANT partnership in general, is a work in progress. There is a need to constantly strive for improvement and to achieve excellence.

# 1 Introduction

The 2017 National Research and Education Network (NREN) Satisfaction Survey, carried out and managed by GN4-2 Networking Activity 3 Partner, User and Stakeholder Relations, Task 1 European and Global NREN Account Management (NA3 T1, also known as the Partner Relations team), was the fifth in the survey initiative that began in 2012.

## 1.1 Objectives

The objectives of this and previous NREN Satisfaction Surveys were to:

- Assess satisfaction with GÉANT's activities.
- Assess the importance of and satisfaction with specific aspects, products and services.
- Help GÉANT better understand the community's needs.
- Determine how and where to focus efforts in the future.

## 1.2 Scope

The range and diversity of questions remained the same as the previous year, to allow comparison. The goal was to assess and measure GÉANT NREN satisfaction over five key areas of activity:

- GÉANT organisation.
- GN4-2 project.
- GÉANT network operations.
- GÉANT service portfolio.
- GÉANT collaboration and community activities.

The survey also included a question on how the GÉANT Compendium is used, and ended with an open question inviting respondents to identify the one improvement that would help GÉANT better serve their NREN.



## 1.3 Methodology

The 2017 NREN Satisfaction Survey was based on the 2016 version (covering the GN4-1 project) in order to achieve a level of comparison that was not possible in previous years. The majority of the questions therefore remained the same and followed the same format and categorisation. Even so, the 2017 Survey questions were updated based on comprehensive feedback solicited from GN4-2 Activity Leaders, GÉANT Product Management and subject matter experts. These improvements and revisions included:

- Clarifications to indicate that respondents were not expected to answer every question, but rather encouraged to respond to the questions relevant to their work and experience.
- The addition of a “no opinion” and/or “not applicable” option for relevant questions in order to avoid response errors.
- The addition of filtering to tailor and streamline the survey for respondents.
- Update of the service portfolio surveyed.
- Addition of Service Delivery section.
- Clearer wording and improved visual clarity.

An invitation to take part in the survey was initially sent by GÉANT’s CEO to the GÉANT General Assembly members and Access Port Manager (APM) representatives on 14 February 2017. In total, this led to a mailing list of 141 individuals from 39 GÉANT NRENs (all those directly connected to the GÉANT network and contributing to the cost-share model). The mail was sent using the GÉANT MailChimp account, allowing follow-up on open and click activity. The survey itself was built and developed using the SurveyMonkey [\[SurveyMonkey\]](#) online survey tool, a familiar model and used in previous NREN Satisfaction Surveys.

As in the previous year, the survey was open to all interested parties in the GÉANT community. Recipients of the initial invitation were encouraged to distribute the survey link to as many staff members as they deemed suitable.

Participation in the survey was widely promoted via multiple channels, which boosted the response rate significantly, by nearly 50%.

- An invitation to take part in the survey was also included in all subsequent weekly project news updates sent by the Project Management Office.
- The survey was presented and participation encouraged at the Service and Technology Forum (STF) meeting in Cyprus, in March 2017.
- Bilateral follow-up emails were sent by the Partner Relations team midway through the campaign to NRENs who had not yet responded.

The survey was open for three weeks, and closed on 8 March 2017.

## 2 Response Analysis

### 2.1 Response Rate

The survey response rate was significantly higher (by nearly 50%) than in 2016 in terms of the absolute number of individuals who submitted responses. (Prior to 2016, the Satisfaction Survey allowed only one response per NREN.) Overall, 73 individuals from 34 of 39 NRENs opened and answered the survey, compared to 49 completed responses from 33 different NRENs in 2016. This response rate illustrates strong support for and appreciation of the inclusive approach initiated in 2016 and continued in 2017.

The response rate followed the familiar pattern of spurts after the initial invitation and immediately after the reminder emails.

The highest response rate from a single NREN was 9 in 2017 (from DFN), compared to 4 (from HEAnet) in 2016.

Table 2.1 below shows the number of responses, by NREN, for 2016 and 2017.

NREN	2016	2017	Change
ACOnet	2	2	-
AMRES	1	3	+2
ANA	0	1	+1
ANAS	0	0	-
ARNES	1	2	+1
Asnet-AM	1	1	-
Belnet	0	1	+1
BREN	2	0	-2
CARNet	2	5	+3
CESNET	1	2	+1
CYNET	1	1	-
DFN	1	9	+8

NREN	2016	2017	Change
EENet	2	1	-1
FCT / FCNN	2	2	-
GARR	0	4	+4
GRENA	1	1	-
GRNET	2	1	-1
HEAnet	4	3	-1
IUCC	1	2	+1
JISC	2	2	-
LITNET	1	2	+1
MARnet	1	1	-
MREN	1	1	-
NIIF - HUNGARNET	2	1	-1
NORDUNET	0	0	-
PCSS	1	1	-
RedIRIS / RED.ES	1	3	+2
RENAM	1	1	-
RENATER	1	2	+1
RESTENA	1	3	+2
RoEduNet	2	0	-2
SANET	1	1	-
SURFnet	3	8	+5
SWITCH	3	2	-1
UIIP NASB	1	1	-
ULAKBIM	1	1	-
University of Latvia	1	0	-1
University of Malta	0	1	+1
URAN	1	1	-
<b>Total</b>	<b>49</b>	<b>73</b>	<b>+24</b>

Table 2.1: Number of responses by NREN (country)

## 2.2 Respondents by Field of Expertise

While the survey questions were designed to cover a broad variety of subjects, it was vital to collect data from as evenly distributed a variety of roles and areas of expertise as possible, to render the results meaningful. For example, if the vast majority of the respondents were employed in technical roles, survey results addressing finance and value or marketing support would have limited significance. Therefore it was made clear, via the addition of “no opinion” and/or “not applicable” options that respondents were not expected to answer every question, but rather should focus on areas relevant to their work and experience.

As shown in Table 2.2 below, the actual results did in fact reflect the diversity of the community to a large degree, with relatively even distribution, therefore strengthening the validity of the results. In 2017 there was a significant increase in respondents with “Services management” roles.

Please describe your role in the NREN (select all that apply):				
	2016		2017	
Answer Options	Count	%	Count	%
General management	19	38.8%	28	38.4%
Technical management	17	34.7%	21	28.8%
Financial management	2	4.1%	2	2.7%
Services management	8	16.3%	15	20.5%
Network management	18	36.7%	16	21.9%
Other (please specify)	8	16.3%	17	23.3%
<b>Answered question</b>	<b>49</b>		<b>73</b>	

Table 2.2: Distribution of respondents by area of expertise or role

This relatively even distribution also testifies to the value of the decision made in 2016 to solicit responses from the widest population possible. In 2016, the first year the “one response per NREN” model was terminated, there was a fundamental change in the respondent type, with 73% of respondents being from technical rather than management positions. After just one year, there appears to be an eagerness for NREN contacts to spread an even broader “response net”, as well as a willingness and desire on the part of a more diverse range of professionals to express their opinion and have their voices heard.

Approximately 29% (24 out of 83) General Assembly members responded; there was an expectation that more would do so.

## 3 GÉANT Organisation

### 3.1 Overview

Respondents were presented with a series of six questions addressing their level of satisfaction with the GÉANT organisation in its role as an organisation that develops, delivers and promotes advanced networks and associated e-infrastructure services to support open innovation, collaboration and knowledge sharing among members, partners and the wider research and education networking community. The six questions addressed the following:

- Importance of and satisfaction with GÉANT activities:
  - Managing the GN4-2 project and finances.
  - Operating the GÉANT network and providing network services.
  - Managing regional projects.
  - Organising community knowledge-sharing events and training.
  - Providing middleware / Authentication and Authorisation Infrastructure (AAI) services.
  - Running Task Forces and Special Interest Groups (SIGs).
- Confidence in GÉANT's ability to serve members in the best possible way.
- Rating six primary GÉANT functions on a scale from "excellent" to "poor":
  - Value for money.
  - Promoting the interests of R&E networking to the EC.
  - Promoting NREN interests internationally / with global regional partners.
  - Effectiveness of the General Assembly as the main membership decision-making forum.
  - GÉANT invoicing and billing processes.
  - Keeping NRENs informed of services and activities.
- Use of and satisfaction with GÉANT communications tools:
  - GÉANT website [[GÉANT website](#)].
  - *CONNECT* magazine.
  - PeaR Community News.
  - GÉANT Project Office News.
  - GÉANT Facebook page.
  - GÉANT Twitter feed.
  - GÉANT LinkedIn page
- The accessibility of GÉANT staff.

- The responsiveness and quality of interaction with GÉANT staff.

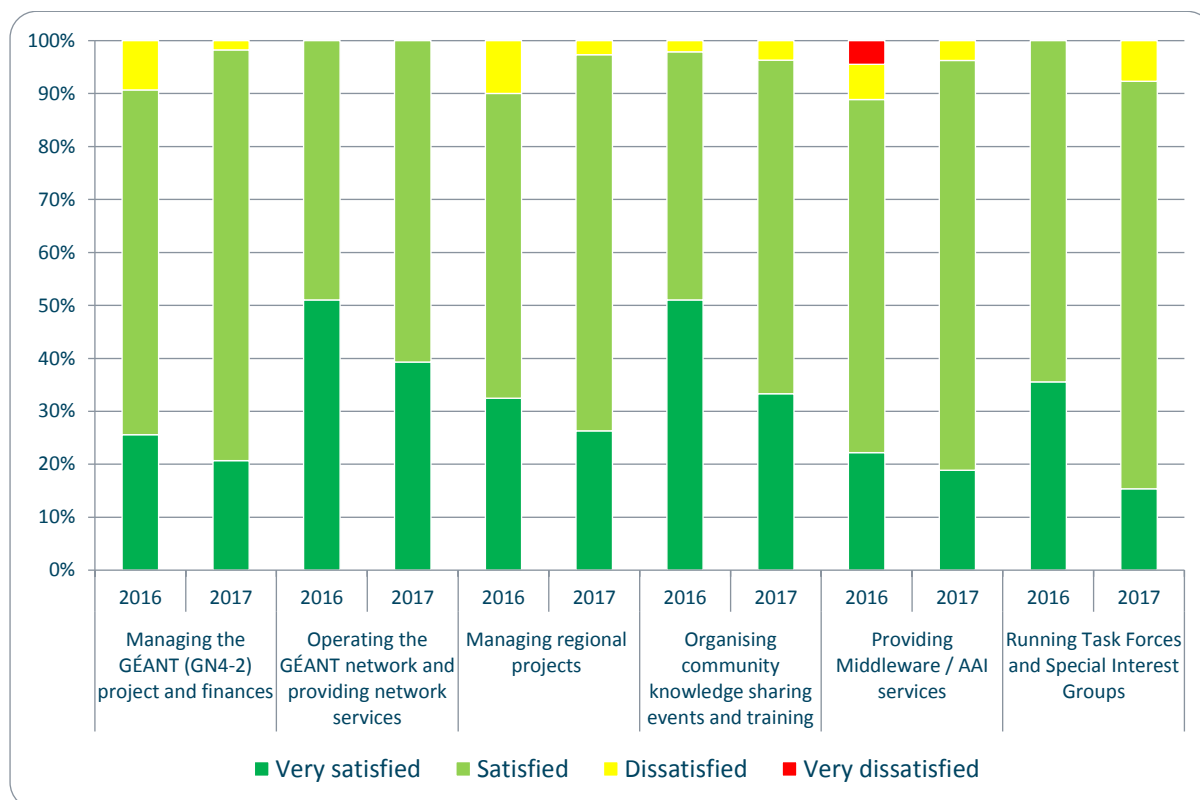
In the data below, “n” represents the total number of respondents who answered the question. The percentages for each option are based on the number of responses received for that option, which may not be the same as the total number who answered the question, and may also differ from the other options within the question, since respondents were not obliged to answer all the options within a question. In calculating the percentages, responses of “no opinion” or “not applicable” were removed to enable comparison with the previous survey. The numbers behind the graphs are provided in Appendix A.

These six questions were identical to those in the 2016 survey, allowing comparative analysis.

## 3.2 Importance of and Satisfaction with GÉANT Activities

### 3.2.1 Results

How satisfied are you with this activity?



2016: n=48; 2017: n=62

Figure 3.1: 2016 and 2017 results for satisfaction with GÉANT activities

### 3.2.2 Analysis

Overall, a high level of satisfaction was expressed in the GÉANT organisation's primary roles.

In 2017, of the 62 respondents to this question, an overwhelming majority indicated they were "very satisfied" or "satisfied" in areas that were deemed important to their NRENs.

A natural tendency to focus on local concerns also remained steady, with the importance of GÉANT management of regional projects remaining relatively low.

Individual comments from respondents expressed the desire for GÉANT to continue, and improve, inter-NREN community support and a need to improve decision-making time and information dissemination when it comes to services. Finally, an opinion was expressed that GÉANT and NRENs should work together to collaborate on international promotion rather than each NREN or GÉANT doing it on their own.

## 3.3 Confidence in GÉANT's Ability to Serve Its Members

### 3.3.1 Results

**I am confident in GÉANT's ability to serve its members in the best possible way.**

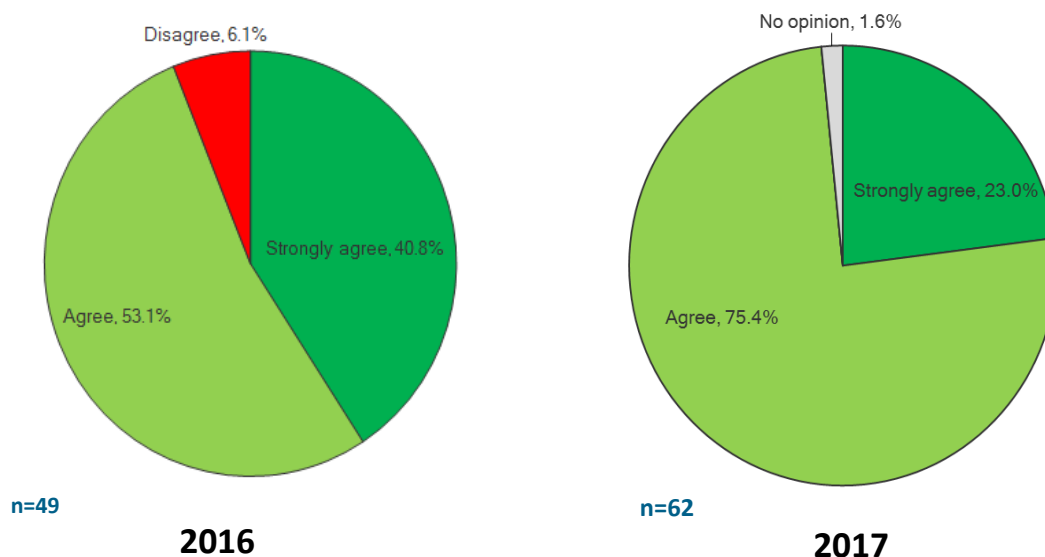


Figure 3.2: 2016 and 2017 results for confidence in GÉANT's ability to serve its members

### 3.3.2 Analysis

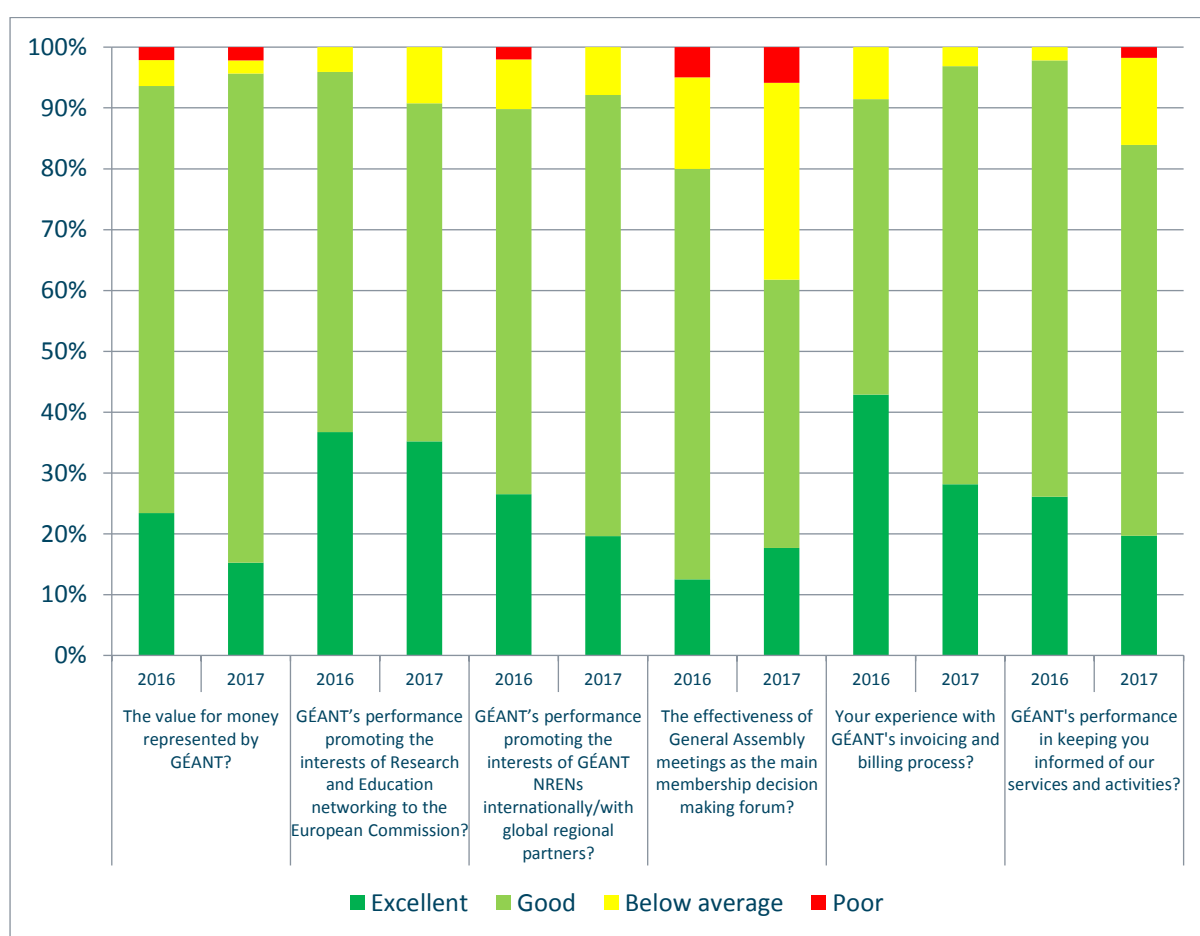
In 2017, when presented with the statement, "I am confident in GÉANT's ability to serve its members in the best possible way", 61 of 62 respondents, or 98.4%, expressed agreement, compared with 93.9% in 2016. Most notably, there was 0% disagreement in 2017 versus 6.1% in 2016.

While agreeing overall with this statement, respondents did express concern about the growing need for fair and equal service for smaller, less-developed countries, and acknowledged the unique challenges GÉANT must face in trying to be an innovator while maintaining operation of a world-class network.

## 3.4 Rating Six Primary GÉANT Functions

### 3.4.1 Results

How would you rate the following:



2016: n=49; 2017: n=59

Figure 3.3: 2016 and 2017 results for rating six primary GÉANT functions

### 3.4.2 Analysis

Overall, a high level of satisfaction was expressed in how the GÉANT organisation carried out its primary functions.



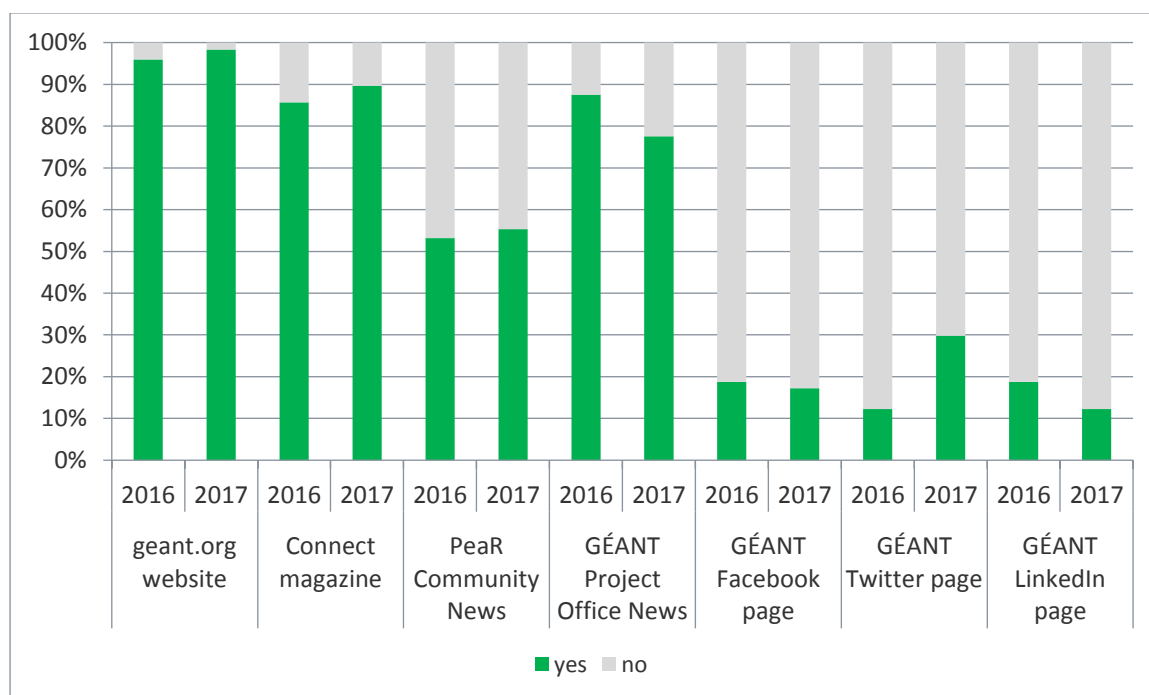
The lower satisfaction in the General Assembly's ability to act as an effective decision-making body is cause for concern. At the same time, respondents acknowledged that creating a meaningful decision-making body for such a diverse group of constituents with such divergent needs is a formidable challenge, and that the existing model, as is, may in fact be the optimal one, given the circumstances.

Also of concern is an overall lower rating of "excellent" or "good" for a number of specific parameters. This means that while GÉANT's constituents are in general satisfied, there is little or no room for the organisation to "rest on its laurels", and users' needs must be constantly monitored and relationships nurtured.

## 3.5 Use of and Satisfaction with GÉANT Communications Tools

### 3.5.1 Results

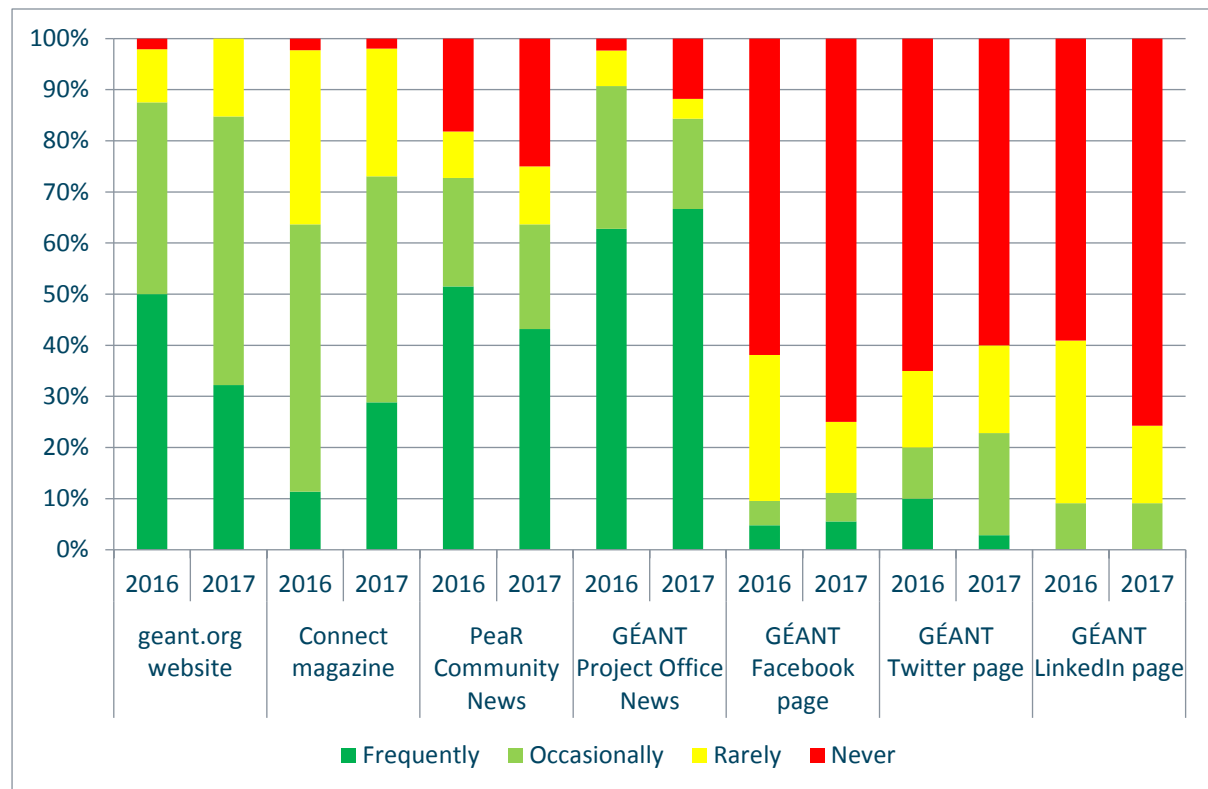
Do you use the following communication tools?



2016: n=49; 2017: n=60

Figure 3.4: 2016 and 2017 results for use of communication tools

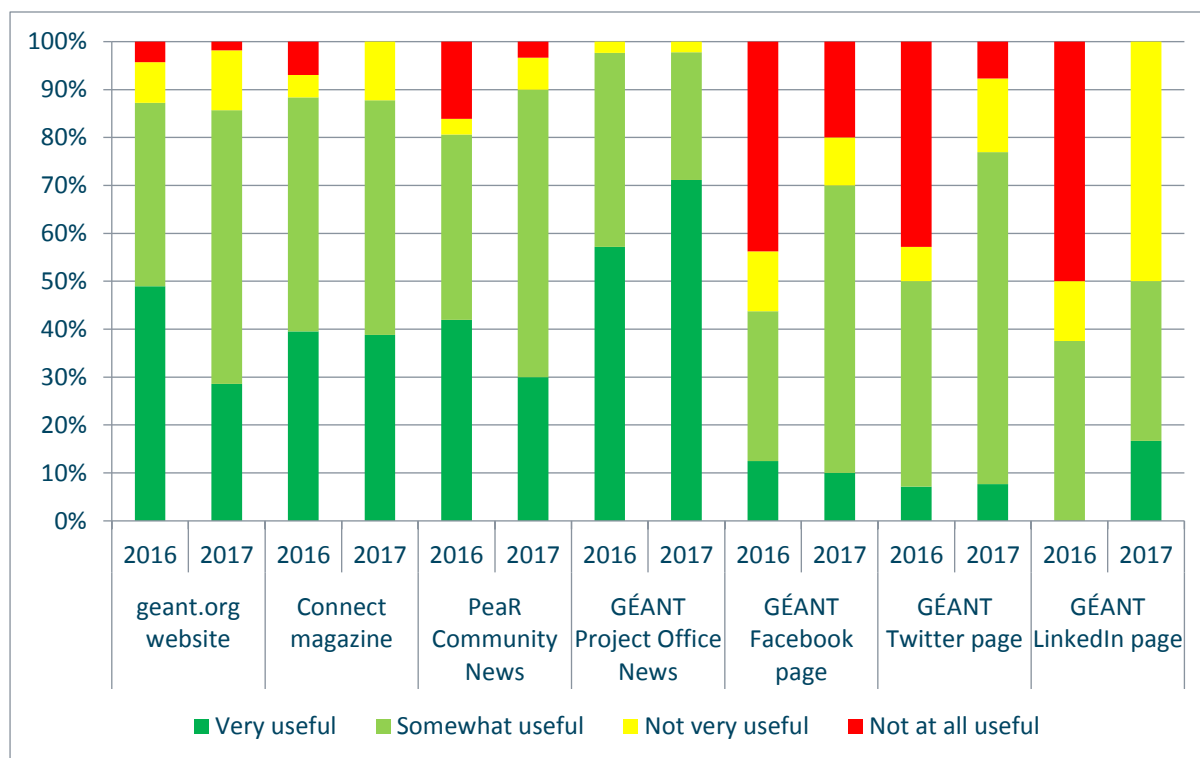
### How often do you use it?



2016: n=49; 2017: n=60

Figure 3.5: 2016 and 2017 results for how often communication tools are used

### How useful do you find it?



2016: n=49; 2017: n=60

Figure 3.6: 2016 and 2017 results for usefulness of communication tools

### 3.5.2 Analysis

There were 60 responses to the questions related to GÉANT's communications initiatives versus 49 in 2016.

Community respondents clearly found the project communications materials useful. The regular Project Office News was highly valued by project participants, with 89% finding it either "very useful" or "somewhat useful". Respondents found LinkedIn a welcome presence, and appreciated that it is being maintained and kept up to date, as well as following the Twitter account. The GÉANT website and *CONNECT* magazine are the traditional "work horses" of the project and the community, and most community members are familiar with them and refer to them (98% of respondents said they used the website; 90% said they used *CONNECT*). There was a decrease in the perceived usefulness of the GÉANT website, which may in part be attributed to the merger and the creation of follow-up satellite web portals for specific activities, such as clouds, eduroam, services, etc. The perceived value of the PeaR Community News decreased as well. The perceived usefulness of *CONNECT* magazine continued to grow.

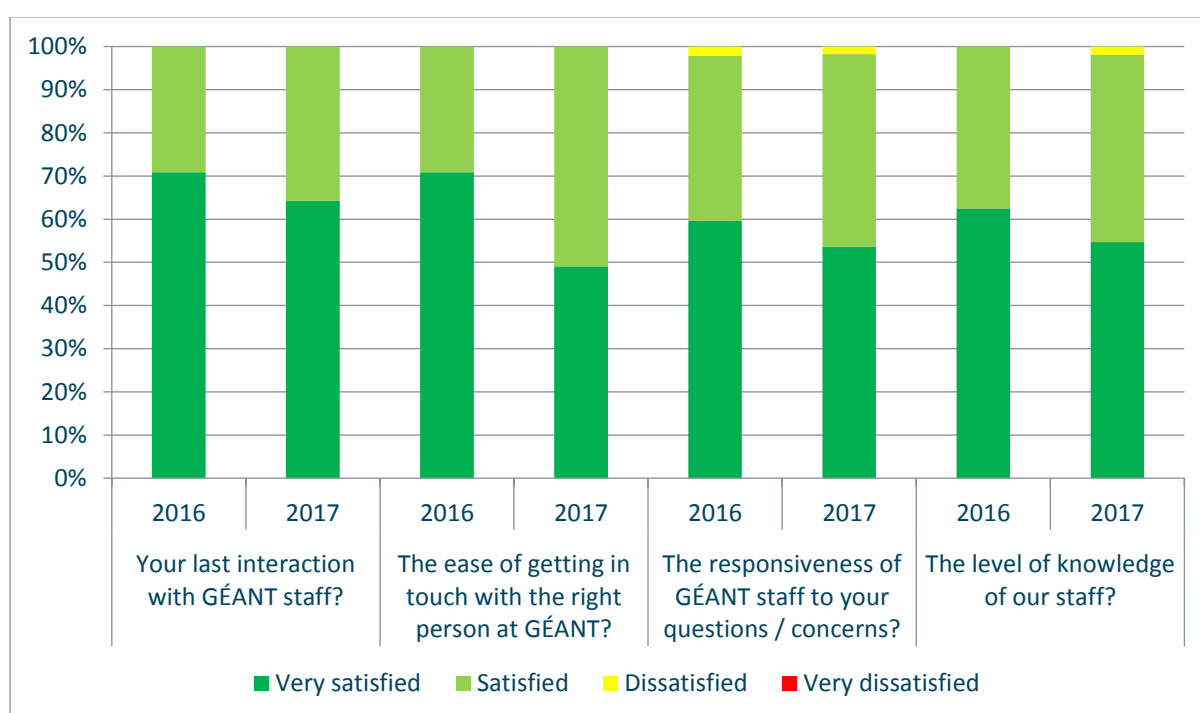
In the individual comments, it was noted that the Twitter feed was used for important events, such as TNC. Other feedback called for better collaboration with NREN communication teams to "close the loop" and make sure GÉANT news and other international information is distributed internally within

the NRENs and not just with executive management; Twitter could be more effective for this than opening or investing in other social media channels.

## 3.6 Responsiveness of and Quality of Interaction with GÉANT Staff

### 3.6.1 Results

How satisfied were you with the following relating to your last interaction with GÉANT staff:



2016: n=49; 2017: n=57

Figure 3.7: 2016 and 2017 results for satisfaction with GÉANT staff

### 3.6.2 Analysis

Of the 60 respondents in 2017 who answered the question as to whether they had had interaction with GÉANT staff in general (question not shown in this document), 58 said that they had had contact with GÉANT staff in the past six months, compared to 48 of the 49 respondents in 2016. This could be seen as a sign of greater overall engagement.

Satisfaction with the responsiveness of the staff has remained steadily high (98% of respondents either “satisfied” or “very satisfied”), but the perceived and experienced lack of ease in getting in touch with GÉANT personnel is an area of concern. This may be due to remaining reorganisation issues. Nevertheless, it is important that this be addressed.

While the vast majority of those adding comments noted timely and professional responsiveness, users did report incidents of receiving no response when contacting GÉANT. One respondent commented that it appeared some GÉANT staff had misconceptions about how NRENs are organised.

## 4 GN4-2 Project

### 4.1 Overview

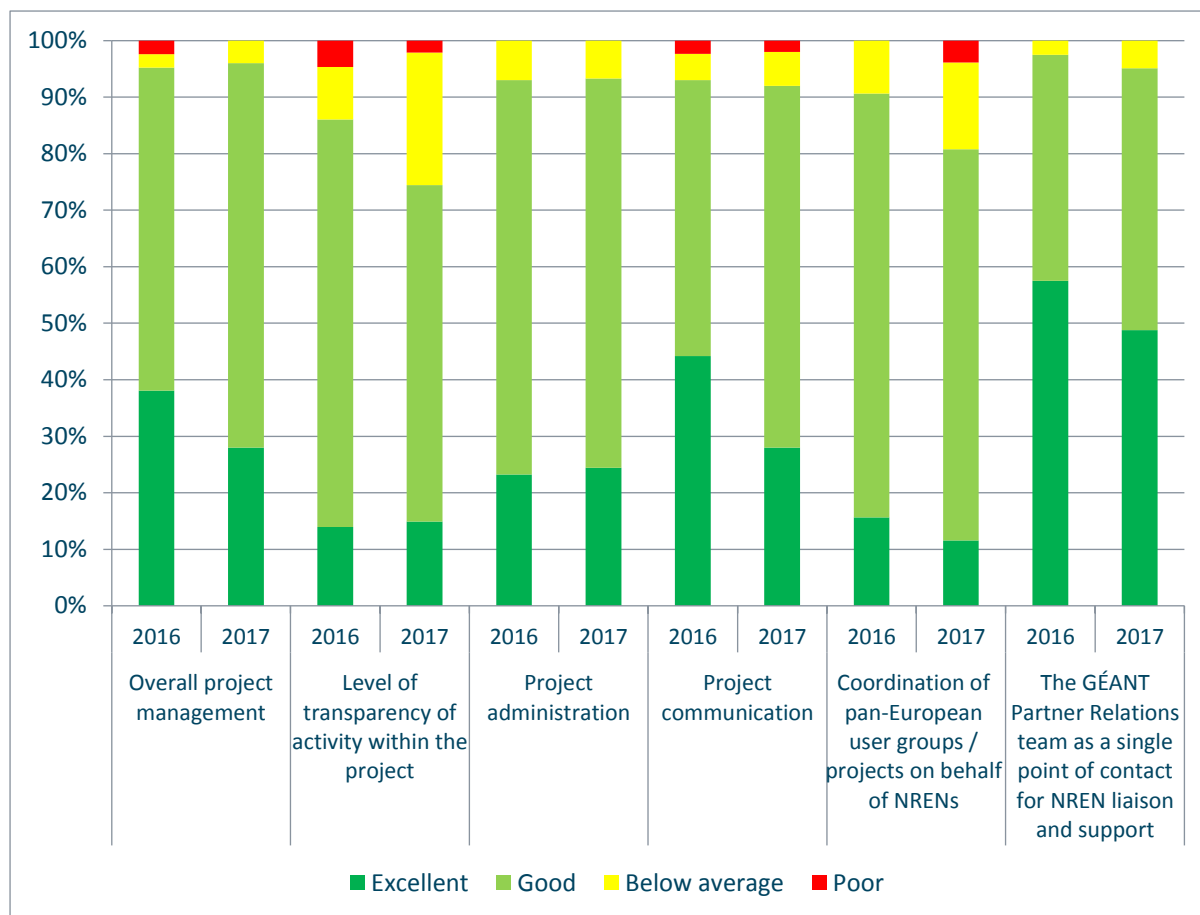
This section of the survey comprised one question to rate the level of satisfaction with the management of the GN4-2 project. Six indices were rated:

- Overall project management.
- Level of transparency of activity within the project.
- Project administration (e.g. meetings, documents, reporting).
- Project communication (e.g. news, bulletins, information on activities).
- Coordination of pan-European user groups / projects on behalf of NRENs (e.g. EUMETSAT, LHCONE).
- The GÉANT Partner Relations team as a single point of contact for NREN liaison and support.

For an explanation of “n” and of the percentages in the data below, please refer to Section 3.1.

## 4.2 Results

How would you rate the following relating to the GN4-2 project?



2016: n=45; 2017: n=59

Figure 4.1: 2016 and 2017 results for satisfaction with the management of the GN4-2 project

## 4.3 Analysis

While overall satisfaction remained high, the percentage of respondents rating elements of the project as “excellent” declined in 2017 compared with 2016. One respondent noted a lack of transparency in work distribution between NRENs.

## 5 Satisfaction with the GÉANT Network and Operations

### 5.1 Overview

This section of the survey encompassed a series of questions asking users to rate the quality and general operation of the GÉANT network, and the activities of the Operations Centre.

With regard to the network, users were asked to rate:

- Overall performance and reliability.
- Operation and management.
- Connectivity with global R&E networks.
- Service and Technology Forum as a means for Access Port Managers (APMs) to receive and share information.
- Ability of the Operations Centre to respond to technical issues.

With regard to the Operations Centre, users were also asked how it rates in relation to new or upgraded service rollouts.

This was followed by a question asking users to rate the level of network security, including specifics on subscriptions to two GÉANT security services: Network Security Handling and Response Process (NSHaRP) and Firewall-on-Demand (FoD).

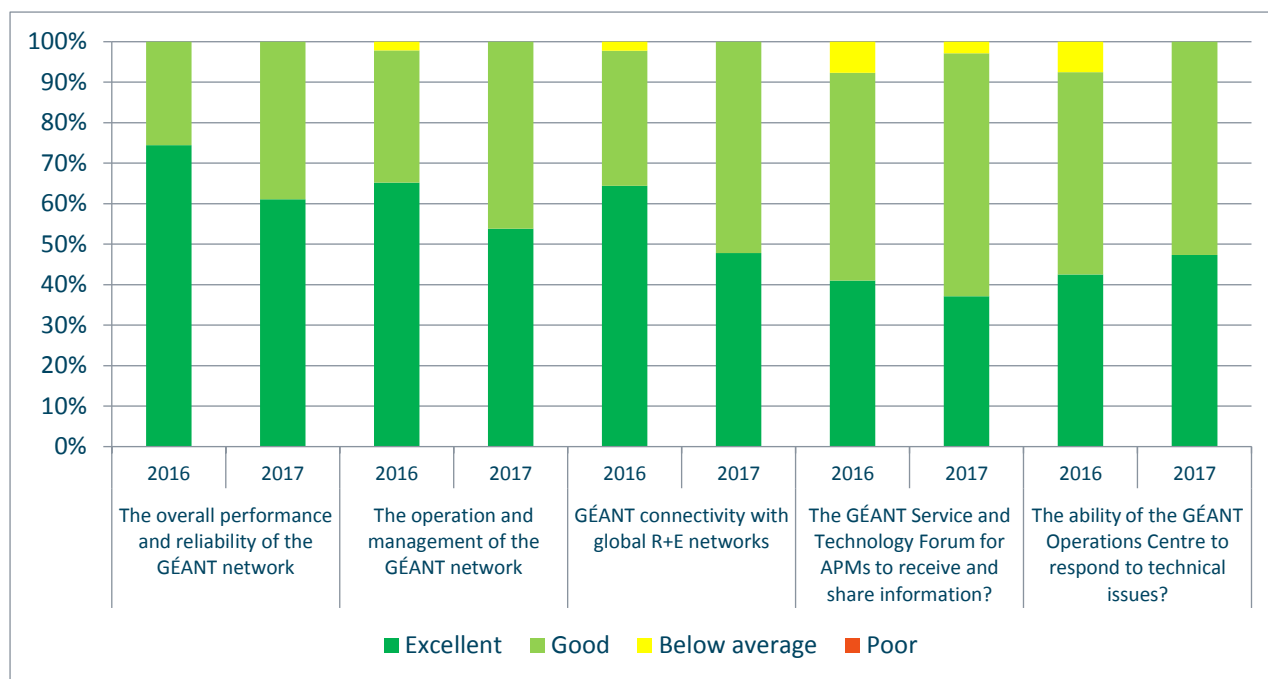
For an explanation of “n” and of the percentages in the data below, please refer to Section 3.1.



## 5.2 Overall Quality, Performance and Management

### 5.2.1 Results

How would you rate the following relating to the GÉANT network:



2016: n=47; 2017: n=59

Figure 5.1: 2016 and 2017 results for rating the GÉANT network

### 5.2.2 Analysis

Overall satisfaction remains relatively high. Three of the four aspects that included “below average” ratings in 2016 received only “excellent” or “good” ratings in 2017 (the percentage of “below average” ratings for the fourth aspect was reduced from 8% to 6%), which is a positive trend.

All of the 59 respondents in 2017 held either general, technical or network manager roles.

This section received a significant number of very constructive and detailed feedback via the individual comments. General feedback on network operations included calls for better correlation of incidents and problems at the service level. Examples given were cases where NRENs were informed of a backbone GÉANT circuit outage by the helpdesk, and then asked by the helpdesk to provide information on VPN outages – which in fact were a consequence of the same outage. In addition, a call for a modern service portal, fulfilling IT service management (ITSM) principles, was identified as a necessity. Users requested that there be better promotion of tools, APIs and standards used by GÉANT and the NREN community. Users also suggested that it could be more effective if GÉANT communicated more about the Operations Centre’s backend work, so that perhaps NRENs who had encountered similar problems on their own networks could contribute from their experience. As noted in other areas, users expressed a need for better communications.

## 5.3 Interaction with the Operations Centre

### 5.3.1 Logging an Issue

#### 5.3.1.1 Results

In 2017, 23 of the 59 respondents reported that they had had an interaction with the Network Operations Centre over the last six months. These absolute numbers are presented in Table 5.1 below, as they usefully reflect the scope of the Operations Centre activity and its use.

	YES		NO	
	2016	2017	2016	2017
Have you logged an issue with the GÉANT Operations Centre in the last 12 months?	29	23	15	16
Was your issue resolved in a timely matter?	28	22	3	1
Was it easy to find the right person to talk to?	28	22	4	1
Did the person fix the problem?	28	21	3	1
Was it easy to raise a ticket with the GÉANT trouble ticketing system?	--	18	--	0

Table 5.1: 2016 and 2017 results for logging an issue with the Operations Centre

#### 5.3.1.2 Analysis

All but one of the 23 respondents who had logged an issue reported that their issue was resolved in a timely matter and that it was easy to find the right person to talk to; all but two reported that the person fixed the problem. 18 responded that it was easy to raise a ticket with the GÉANT trouble ticketing system, and none reported that it was not. This was a significant improvement over last year, when users reported multiple issues with availability, coverage, upgrade problems, lack of procedures for pre-deployment testing and regular testing. The Operations Centre invested significant efforts into resolving these issues over the year.

### 5.3.2 New or Upgraded Service Rollouts

#### 5.3.2.1 Results

In 2017, the survey included a question asking users to rate the Operations Centre's performance as it relates to new service rollouts or service upgrades. The results, given as absolute numbers, are summarised in Table 5.2 below.

	Excellent	Good	Below Average	Poor	No Opinion
The ability of GÉANT Operations to deliver the services/upgrades within your desired timeframe	4	5	1	0	4
The ability of GÉANT Operations to deliver the services/upgrades to your expected standard	5	4	1	0	3
The frequency, accuracy and helpfulness of communication and updates during the service provision	5	4	1	0	3

Table 5.2: 2017 results for new or upgraded service rollouts

### 5.3.2.2 Analysis

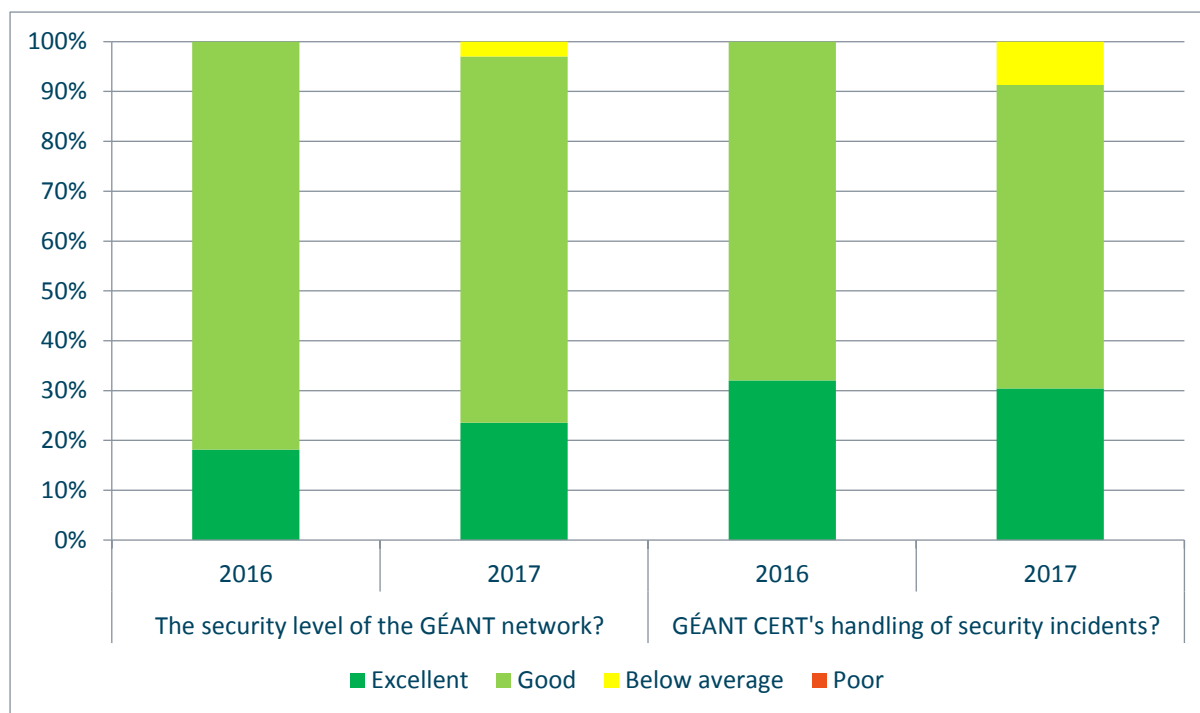
14 respondents rated the performance having “requested one or more new or upgraded services in the last 12 months”. While most were satisfied, or had “no opinion”, one registered a “below average” rating, though added no supporting comments.

This question was not in the 2016 survey.

## 5.4 Network Security

### 5.4.1 Results

How would you rate . . .



2016: n=33; 2017: n=56

Figure 5.2: 2016 and 2017 results for rating network security

### 5.4.2 Analysis

Network security is clearly an important issue. The makeup of the respondents' backgrounds did not change significantly, with approximately the same percentage of respondents skipping this question in both years. However, a significant percentage in 2017 offered a response of "no opinion". This could indicate that many do not know very much about GÉANT's security mechanisms. While their users' level of network security knowledge is clearly a concern for NRENS, it could stem from lack of awareness of GÉANT's activities in the area of security. This latest result indicates that more work needs to be done in communicating to NRENS the security mechanisms and strategies in place, and make them more aware of the measures taken by GÉANT in this area.

Despite the generally positive ratings, overall, the level of satisfaction regarding how GÉANT handled security incidents declined relative to 2016, indicating that more work is needed. This important finding, and the results of the 2016 survey (where several of these issues were first raised), have led to significant efforts in this area being planned for GN4-2. In addition, GÉANT has set up a new dedicated Security Team, with a new Chief Security Officer in place as of April 2017.

In the 2017 survey, one respondent felt that the security of the GÉANT network was “below average” and two respondents rated the GÉANT Computer Emergency Response Team’s (CERT’s) handling of security incidents as “below average”. This was reflected in the individual comments. One user stated that they rely on their own NREN CERT. Another suggested there should be better coordination with local CERTs and Computer Security Incident Response Teams (CSIRTs) and more promotion of GÉANT’s security services. Another mentioned that it was not clear to their team what the GÉANT security team actually did, although when it came to Network Operations Centre activities, this was very clear. Another suggested that the GÉANT Distributed Denial of Service (DDoS) service be expanded to NRENs’ channels, including commodity IP. All called for more communication, with one respondent requesting that “APMs be informed of any issues. Have not seen a single security issue mentioned in the past 3 years and I would assume there have been [some].”

### 5.4.3 NSHaRP Usage



Users were asked if they use the GÉANT NSHaRP service [[NSHaRP](#)] to thwart DDoS threats. NSHaRP provides a mechanism to quickly and effectively inform affected users and to manage the mitigation process. It allows CERTs to tailor how and for what type of incidents they want their notifications to be triggered. The system serves as an extension to NREN CERTs, if they do not have either the human or technical resources available to monitor security incidents affecting users.

#### 5.4.3.1 Results

11 NRENs reported that they subscribed to this service.

#### 5.4.3.2 Analysis

This reflects a very slight uptake over the year – in 2016, 7 NRENs said they subscribed. Comments were varied. Most respondents said they did not know if they subscribed, or had no information on the service, or that the GÉANT service portal was difficult to understand. This indicates a need for better communication and promotion with local NREN security teams. Others expressed an interest and intent to subscribe. Several mentioned that the service is only for GÉANT traffic and that, without gateways, it was not helpful in mitigating most threats that come from other sources. One security team did test the service but did not continue using it and did not state why.

### 5.4.4 Firewall-on-Demand (FoD) Usage

Firewall on Demand (FoD) [[Firewall-on-Demand](#)] is a system that allows authorised users, via a web portal, to quickly create and disseminate firewall filters based on traffic flows to or from their designated address space. This system allows NRENs to filter and block malicious traffic flows from within the GÉANT backbone, giving NRENs power and control over network security.

#### 5.4.4.1 Results

15 NRENs reported that they subscribed to use this service.

#### 5.4.4.2 Analysis

This question was not included in the 2016 survey, so no comparison is possible.

When asked to “please let us know what GÉANT would need to change/improve for your NREN to subscribe”, several respondents reported that they plan to subscribe to the service. Several reported, as above, that they lacked clear information on the service and would like to see a more streamlined way to subscribe to this and other GÉANT services – again indicating a need for better communication and promotion of the service with local NREN security teams. Others reported that it didn’t fit their own tools/requirements. One respondent suggested the service be called “Filter on Demand” since Firewall on Demand is seen by their clients as something very different. Another NREN said that they apply filters individually on user demand.

## 6 Satisfaction with the GÉANT Service Portfolio

### 6.1 Overview

The objective of this section of the survey was to get a high-level overview of how the service portfolio is perceived and valued, and at the same time to drill down deeper in five service categories to obtain information on usage, perceived quality and satisfaction level for specific services within each of those categories. The categories, specific services and questions asked are summarised in Table 6.1 below.

Since the service portfolio has changed since the last survey was conducted, several services included in 2016 were removed in 2017 as they have been discontinued.

The following sub-sections present, for each service category:

- Summary of the services included.
- Comparison data with 2016, where available.
- Notes and comments recorded.

In the data analysis, the primary parameter checked is NREN usage (presented in absolute terms), in order to gauge increase or decline in uptake compared to the previous period. Where usage is steady or high, the assessment of the importance and quality of the service is presented as a percentage of the total responses received for that question option. In cases where usage is minimal, analysis of the quality is presented in absolute terms.

Service Category	Specific Services	Question
<b>1. Software-Defined Networking</b>	–	Planned deployment – Y/N
<b>2. Network-Based Services</b>	GÉANT IP GÉANT World Service GÉANT Peering GÉANT Plus GÉANT Lambda GÉANT Open L3-VPN MD-VPN	Deployed – Y/N Level of importance Satisfaction rating

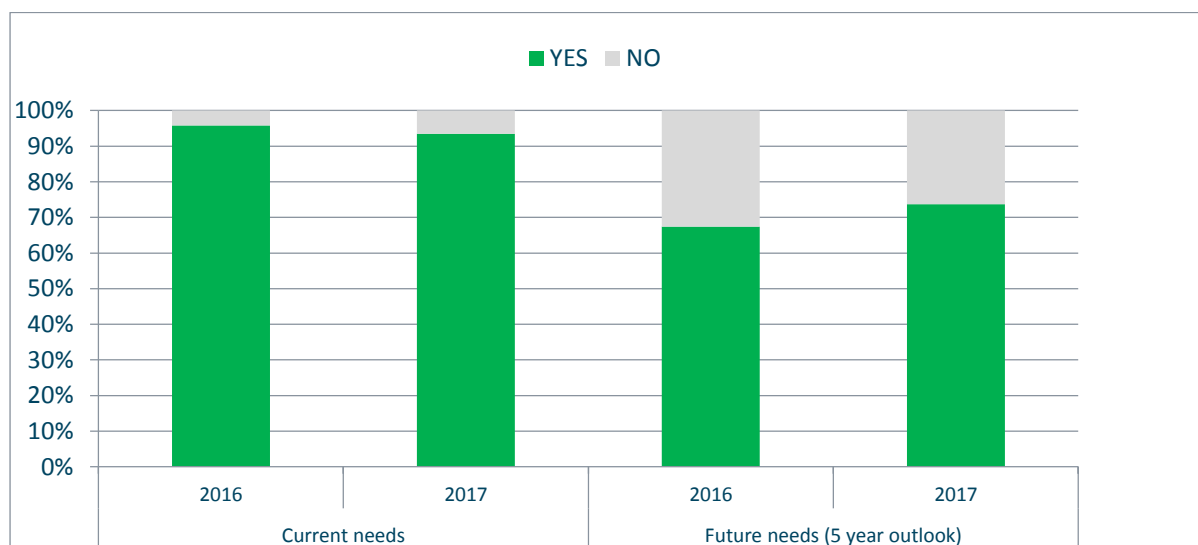
Service Category	Specific Services	Question
	GÉANT Testbed Service perfSONAR	
<b>3. Trust, Identity &amp; Security Services</b>	eduGAIN eduroam eduPKI TCS FaaS	Deployed – Y/N Level of importance Satisfaction rating
<b>4. Cloud Services</b>	GÉANT Cloud Catalogue	Deployed – Y/N Level of importance Satisfaction rating
<b>5. Real-time Communications Services</b>	eduOER NRENum.net	Deployed – Y/N Level of importance Satisfaction rating

Table 6.1: Five service categories, specific services and questions asked

## 6.2 Overall Service Portfolio

### 6.2.1 Results

Does GÉANT's service portfolio meet your NREN's current and future needs?



2016: n=48; 2017: n=46

Figure 6.1: 2016 and 2017 results for overall service portfolio



## 6.2.2 Analysis

Overall, 93% of the respondents who answered felt that GÉANT's service portfolio meets their current needs, and 73% felt that it will meet their future needs. Of the 46 respondents in 2017, many commented that a five-year outlook was too distant and that they could not respond to the question with confidence.

Others said that they believe the "tech-push"-driven portfolio is not optimal, and that GÉANT (and in turn NRENs) needs to be more flexible and create service extensions to meet demand from users for more commodity IT services, such as personal storage, Infrastructure as a Service (IaaS), email, etc.

Users who are outside the fibre backbone reported that this impacts availability of GÉANT services. Also, some NRENs simply felt no need for many of GÉANT's services. Other felt that, with regard to inter-NREN connectivity, demand for services will remain steady, but that other services external to this would most likely not be sustainable.

Important to note is feedback expressing the opinion that GÉANT should be more transparent regarding its service and growth, and should deepen its interaction with NREN portfolio managers, specifically in regard to tariffs.

Responses to the question, "Which services would you like GÉANT to offer in the future?", included:

- More brokered cloud services such as joint pan-European tenders and framework agreements.
- As an OTT, GÉANT could provide the platform that can be used to instance the service in each NREN (federated model).
- Brokerage and licence optimisation.
- Intrusion detection services.
- Data curation analytics tools.
- Access to scientific licensed publications.
- Access to VC systems for NRENs via eduGAIN.
- Email, electronic filing, document exchange, backup.

## 6.3 Network-Based Services

Connectivity and network management services support the NRENs in delivering world-class network facilities to the research and education community.

### 6.3.1 Usage

#### 6.3.1.1 Results

Table 6.2 below shows the number of NRENs deploying network-based services – based on survey responses – compared to responses in 2016.

SERVICE	Number of NRENs Using the Service		Change
	2016	2017	
GÉANT IP	27	31	4
GÉANT World Service	19	20	1
GÉANT Peering	21	21	0
GÉANT Plus	11	12	1
GÉANT Lambda	4	9	5
GÉANT Open	0	2	2
L3-VPN	12	8	-4
MD-VPN	12	11	-1
GÉANT Testbed Service	7	7	0
perfSONAR	13	16	3

Table 6.2: 2016 and 2017 results for number of NRENs using network-based services

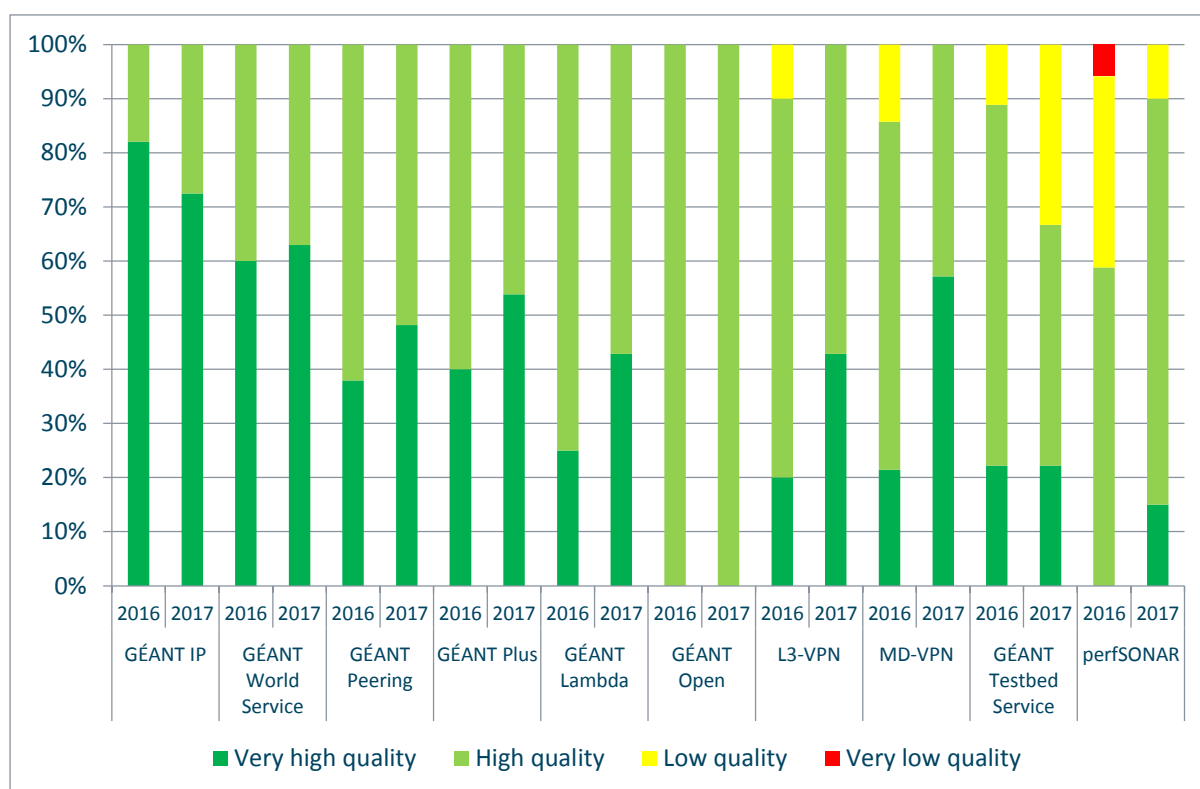
### 6.3.1.2 Analysis

There was a slight increase in uptake of several services: GÉANT IP, Plus, Lambda, Open, World Services and perfSONAR. Use of GÉANT Peering and the GÉANT Testbed Service remained unchanged. There was a slight decrease in use of L3-VPN and MD-VPN.

## 6.3.2 Quality

### 6.3.2.1 Results

The respondents' assessment of the quality of these network-based services is summarised in Figure 6.2 below. In the related table, "n" represents the total number of respondents who answered the quality assessment section of the question for each service. The percentages for each option are based on the number of responses received for that service. In calculating the percentages, responses of "no opinion" or "not applicable" were removed to enable comparison with the previous survey. The numbers behind the graphs are provided in Appendix A.4.



n=	GÉANT IP	GÉANT World	GÉANT Peering	GÉANT Plus	GÉANT Lambda	GÉANT Open	L3-VPN	MD-VPN	GÉANT Testbed Service	perfSONAR
2016	39	30	29	15	8	3	10	14	9	17
2017	40	27	27	13	7	1	7	14	9	20

Figure 6.2: 2016 and 2017 results for quality of network-based services

### 6.3.2.2 Analysis

In general, these network-based services were considered to be “very high quality” or “high quality”. Ratings for MD-VPN improved significantly, as NRENs acknowledged the experience acquired through the first large service deployment: PRACE has moved its previous network solution to a pan-European MD-VPN. In addition, there were improvements in the assessment of all point-to-point (P2P) services. Significant improvement in both deployment and perceived quality of perfSONAR is apparent. Despite no respondents reporting usage of GÉANT Open in 2016, it was rated “high quality” by 3 respondents. The lower quality rating of the Testbed as a Service offering is in all likelihood due to its still being in the early development phases. No network-based services were rated “very low quality”.

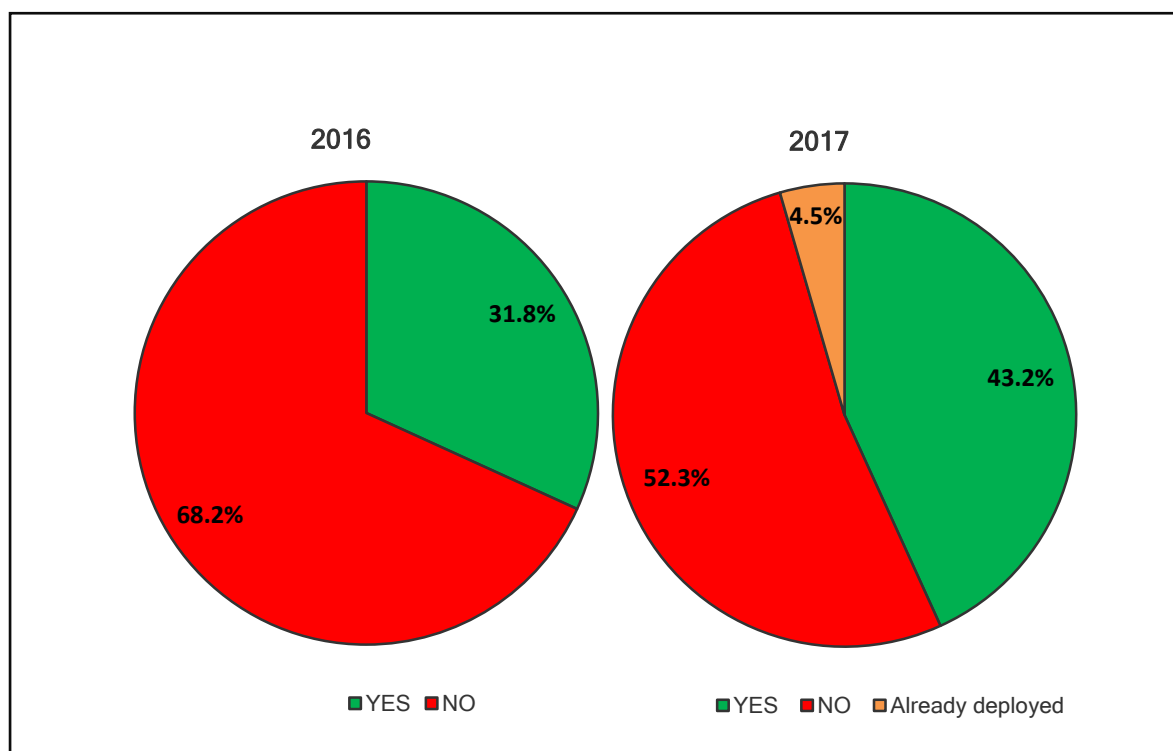
## 6.4 Software-Defined Networking

GÉANT is investigating the integration of software-defined networking (SDN) technology into the GÉANT network, in line with the national efforts of many NRENs in this area. SDN introduces a more flexible way of service provisioning. During GN4-1, GÉANT delivered proofs of concept for SDN-based capabilities in the backbone within lab environments. Significant expertise has been developed in the

specification, implementation and testing of SDN-based functionality utilising white boxes, industry-endorsed controller frameworks and purpose-built network applications. GÉANT project teams are developing, designing and implementing pilots of the SDN-based capabilities, carefully engineered within the GÉANT project in order to demonstrate their suitability for integration into the operational environment.

### 6.4.1 Results

**Does your NREN plan to deploy software-defined networking (SDN) in the next 12–18 months?**



2016 and 2017: n=44

Figure 6.3: 2016 and 2017 results for planned deployment of SDN

### 6.4.2 Analysis

The uptake of SDN capabilities amongst NRENs is in line with project objectives, as can be seen in the growth of actual pilots and deployments, as well as the increase in planned deployments, as this topic becomes increasingly important.

## 6.5 Trust, Identity and Security Services

Trusted digital identities, underpinned with secure technologies, allow students, researchers and institutions to simply and securely access content and services, collaborate, teach, analyse and share

data, and access resources. GÉANT provides services that build trust, promote security and support the use of online identities, through a range of activities and international collaborations.

## 6.5.1 Usage

### 6.5.1.1 Results

Table 6.3 below shows the number of NRENs deploying trust, identity and security services – based on survey responses – compared to responses in 2016.

SERVICE	Number of NRENs Using the Service		Change
	2016	2017	
eduGAIN	24	25	1
eduroam	30	31	1
eduPKI	7	7	0
TCS	17	19	2
FaaS	1	4	3

Table 6.3: 2016 and 2017 results for number of NRENs using trust, identity and security services

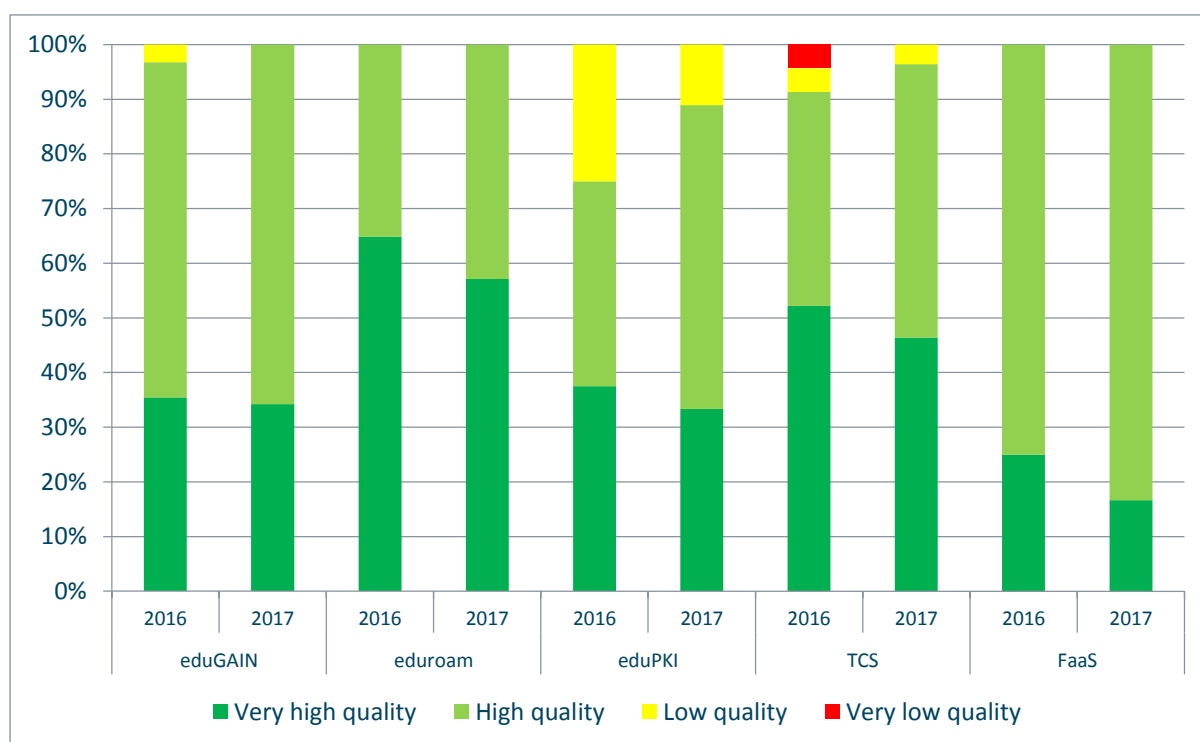
### 6.5.1.2 Analysis

Slight increases in uptake were reported in the number of NRENs deploying four of the services, most notably 3 additional NRENs deploying Federation as a Service (FaaS).

## 6.5.2 Quality

### 6.5.2.1 Results

The respondents' assessment of the quality of these trust, identity and security services is summarised in Figure 6.4 below. For an explanation of “n” in the related table, and of the percentages, please refer to Section 6.3.2.1.



n=	eduGAIN	eduroam	eduPKI	TCS	FaaS
2016	31	37	8	23	4
2017	38	49	9	28	6

Figure 6.4: 2016 and 2017 results for quality of trust, identity and security services

### 6.5.2.2 Analysis

eduroam and eduGAIN are clearly well entrenched in the NREN community, with high usage and high quality-assessment ratings. The Trusted Certificate Service (TCS) is also relatively well entrenched, and registered a higher quality rating than in the previous year, but was considered less important. All of the few users who responded to the quality assessment of FaaS reported high ratings.

In the comments, strong demand for better operational support for Authentication and Authorisation Infrastructure (AAI) services was noted. GÉANT has already acted upon these concerns with the hire of a Chief Community Support Officer focusing on AAI topics, as well as plans to invest increased in-house resources in this area.

## 6.6 Cloud Catalogue

The Cloud Catalogue [\[Cloud Catalogue\]](#) is a relatively new initiative for GÉANT. It lists a diverse range of service providers and cloud services, structured to help NRENs clarify the capabilities of providers, to assist and streamline procurement processes. In 2016 and 2017 a lot of work has been done to create the foundation to enable and support national rollouts.

The activity has made substantial progress over the last year. A major Infrastructure as a Service (IaaS) framework of agreements with vendors from across Europe was completed in the first half of 2017. A programme of workshops to enable NRENs to generate detailed tactical plans is currently underway. Initial early stages of adoption and national rollouts are very encouraging. NRENs have appointed designated Cloud Managers, and attendance at seminars, workshops and weekly briefings is strong. In addition, communications efforts have begun. A new dedicated cloud website and practical publications to guide NRENs are currently under development.

## 6.6.1 Usage

### 6.6.1.1 Results

Table 6.4 below shows the number of NRENs using the Cloud Catalogue – based on survey responses – compared to responses in 2016.

SERVICE	Number of NRENs Using the Service		Change
	2016	2017	
GÉANT Cloud Catalogue	7	10	3

Table 6.4: 2016 and 2017 results for number of NRENs using the Cloud Catalogue

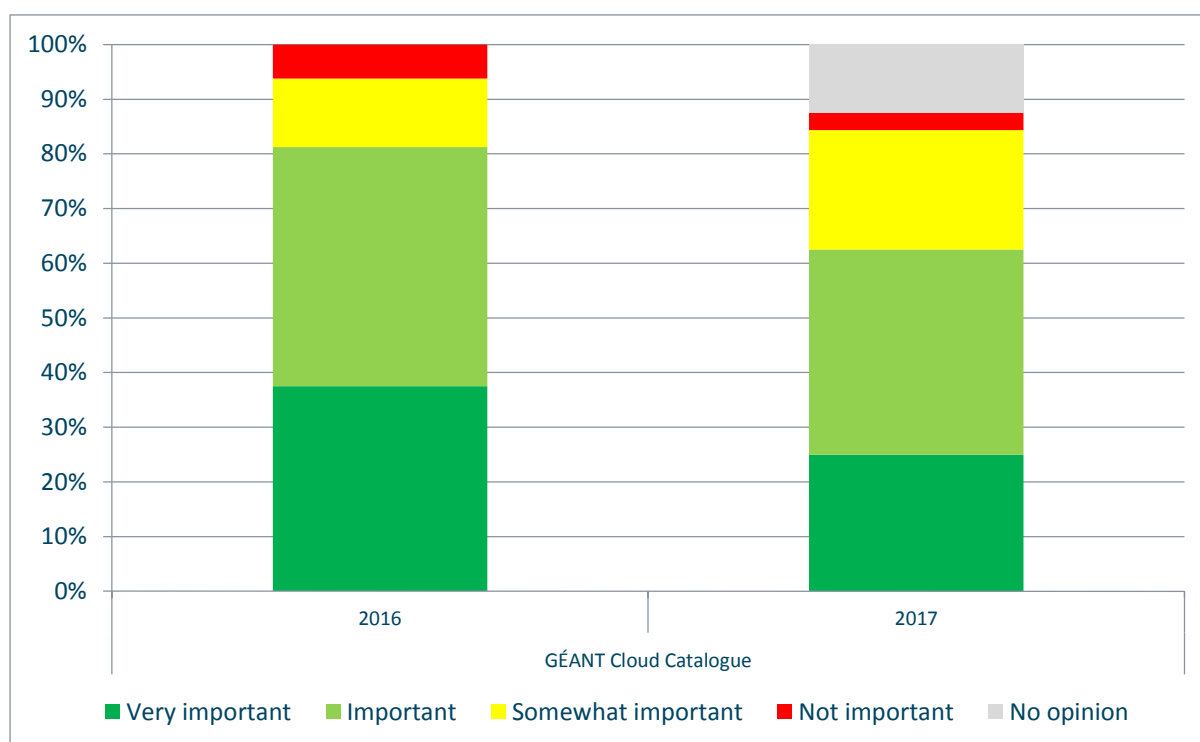
### 6.6.1.2 Analysis

The number of NRENs using the service has increased by 3. Uptake is expected to increase further as the Catalogue is developed in line with NREN feedback as to their requirements.

## 6.6.2 Importance

### 6.6.2.1 Results

The respondents' assessment of the importance of the Cloud Catalogue is summarised in Figure 6.5 below. In the data, "n" represents the total number of respondents who answered the importance assessment section of the question for the Cloud Service Catalogue. In calculating the percentages, responses of "no opinion" have been included, as they are thought to be a significant indicator in this key emerging area. Numbers enabling comparison with the previous survey are provided in Appendix A.4.



2016: n=16; 2017: n=28

Figure 6.5: 2016 and 2017 results for importance of the Cloud Catalogue

### 6.6.2.2 Analysis

While the survey results regarding the importance of this service are in line with the maturity of the offering, the number of individuals responding to the question about its importance increased from 16 to 28, with only 4 offering a response of “no opinion” on the importance of the service in 2017. This indicates a growing level of awareness and concern about this emerging area.

## 6.7 Real-time Communications Services

Online communications are crucial to research and education. Real-time communications (RTC) [[Real-time communications](#)] is a rapidly developing area and GÉANT is working to support and foster innovation for the NRENs and their communities.

GÉANT's eduOER service is designed to enable structured searching and reuse of digital multimedia learning and educational materials, known as Open Educational Resources (OER), that are scattered across Europe in multiple repositories, infrastructures and services. NRENum.net provides a solution for seamless dialling interconnection between multiple technologies, translating standard telephone numbers into IP addresses to facilitate VoIP and videoconferencing.



## 6.7.1 Usage

### 6.7.1.1 Results

Table 6.5 below shows the number of NRENs using RTC services – based on survey responses – compared to responses in 2016.

SERVICE	Number of NRENs Using the Service		Change
	2016	2017	
eduOER	2	4	2
NRENum.net	7	7	0

Table 6.5: 2016 and 2017 results for number of NRENs using RTC services

### 6.7.1.2 Analysis

According to the survey responses, the RTC services are not deployed widely and are hardly known across the community. In 2017, 14 individuals responded that they were not aware of the eduOER service and 10 were not aware of the NRENum.net service.

## 6.7.2 Quality

### 6.7.2.1 Results

The respondents' assessment of the quality of these RTC services is summarised in Figure 6.6 below.



n=	eduOER	NRENum.net
2016	4	9
2017	8	10

Figure 6.6: 2016 and 2017 results for quality of RTC services

#### 6.7.2.2 Analysis

In 2017, 6 of the 8 respondents rated the eduOER service as being of “very high quality” or “high quality”, but 2 rated it as “low quality”. In 2016, 4 out of the 4 respondents who answered this part of the question rated the quality of the service as being very high or high. It appears that these numbers are too low to use as a fair assessment of satisfaction with the quality of the service.

## 7 Collaboration and Community Activities

### 7.1 Overview

GÉANT collaborates with members, partners and research, education and innovation communities to drive research and discovery – keeping Europe at the heart of global research and education networking. Two questions were included to gauge NRENS’ level of participation in these initiatives, as well as their view on whether and how they add value or assist them.

The activities and events rated were:

- Task Forces / Special Interest Groups.
- The Networking Conference (TNC).
- Research and Education Federations (REFEDS) meetings.
- Knowledge transfer events.
- Training workshops.
- Digital Infrastructure for Research (DI4R) – a new event.

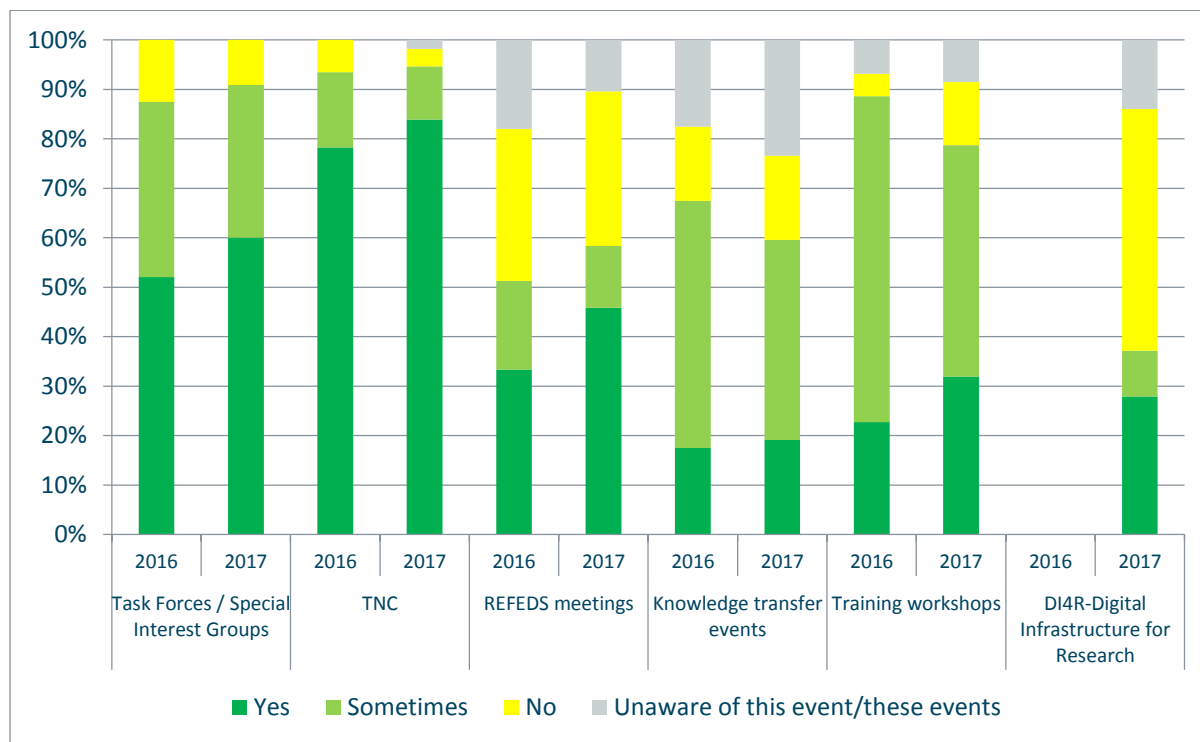


In the data below, “n” represents the total number of respondents who answered the question. The percentages for each event are based on the number of responses received for that event. In calculating the percentages, responses of “no opinion” or “not applicable” were removed to enable comparison with the previous survey.

## 7.2 Attendance

### 7.2.1 Results

Figure 7.1 below shows the number of NRENs attending collaboration and community events.



2016: n=48; 2017: n=56

Figure 7.1: 2016 and 2017 results for attendance at collaboration and community events

### 7.2.2 Analysis

In 2017, 56 community members responded, compared to 48 in 2016.

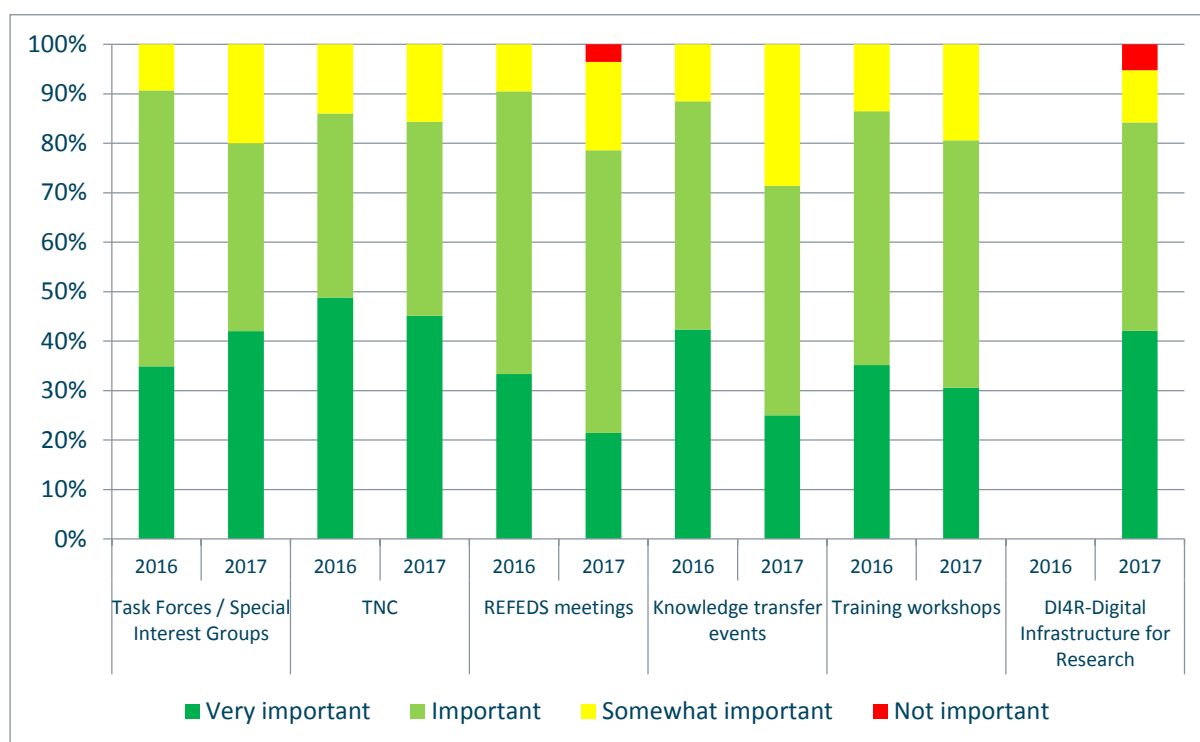
In all cases, the percentage of respondents attending events increased in 2017, which is encouraging. However, the percentage of respondents who said they did not attend, or who were unaware of the event, indicates that further communications effort is necessary both to raise awareness, and to emphasise the value of the events, in addition to efforts to address any issues relating to perceived importance and quality (discussed below). (The figures for not attending were the same or lower for all except knowledge transfer events, which increased by 2%, and training workshops, which increased by 8%, and were significant (49%) for the new DI4R event. The figures for unawareness increased slightly for TNC (2%), knowledge transfer events (5%) and training workshops (2%), and were significant (14%) for DI4R.)

One respondent noted that price was a prohibitive factor regarding attendance at TNC. It is acknowledged that lack of time, as well as cost, can be a reason for not attending events, particularly for small NRENs.

## 7.3 Importance

### 7.3.1 Results

Figure 7.2 below shows the NRENs' assessment of the importance of collaboration and community events.



2016: n=48; 2017: n=56

Figure 7.2: 2016 and 2017 results for importance of collaboration and community events

### 7.3.2 Analysis

Again, 56 community members responded in 2017, compared to 48 in 2016.

The ratings for the perceived importance of collaboration and community events remained high, despite the slight decrease in quality and satisfaction ratings (see Section 7.4 below), with over 70% of respondents assessing each event as either “very important” or “important”, and a slight increase in the percentage of respondents who assessed the Task Forces (TFs) and Special Interest Groups (SIGs) as “very important”. However, overall ratings were slightly lower in 2017, particularly for REFEDS meetings and knowledge transfer events, indicating that further communications effort and follow-up investigations are required.

Comments included the importance of the new DI4R event, even if attendance was not possible. One user further commented that DI4R was more important than TNC because it included other research infrastructures.

## 7.4 Quality

### 7.4.1 Results

Figure 7.3 below shows the NRENs' assessment of the quality of collaboration and community events.



2016: n=48; 2017: n=56

Figure 7.3: 2016 and 2017 results for quality of collaboration and community events

### 7.4.2 Analysis

As above, in 2017, 56 community members responded, compared to 48 in 2016.

Despite a slight decrease in quality ratings across all events (which is consistent with the slight decrease in overall satisfaction with GÉANT organisation activities relating to organising knowledge-sharing events and training, and running TFs and SIGs (Section 3.2 above)), these events are considered in general as “high quality” or “very high quality” by a significant majority of respondents. It was especially encouraging that the new DI4R event had such a successful start, with over a third of the respondents rating it as “very high quality”.

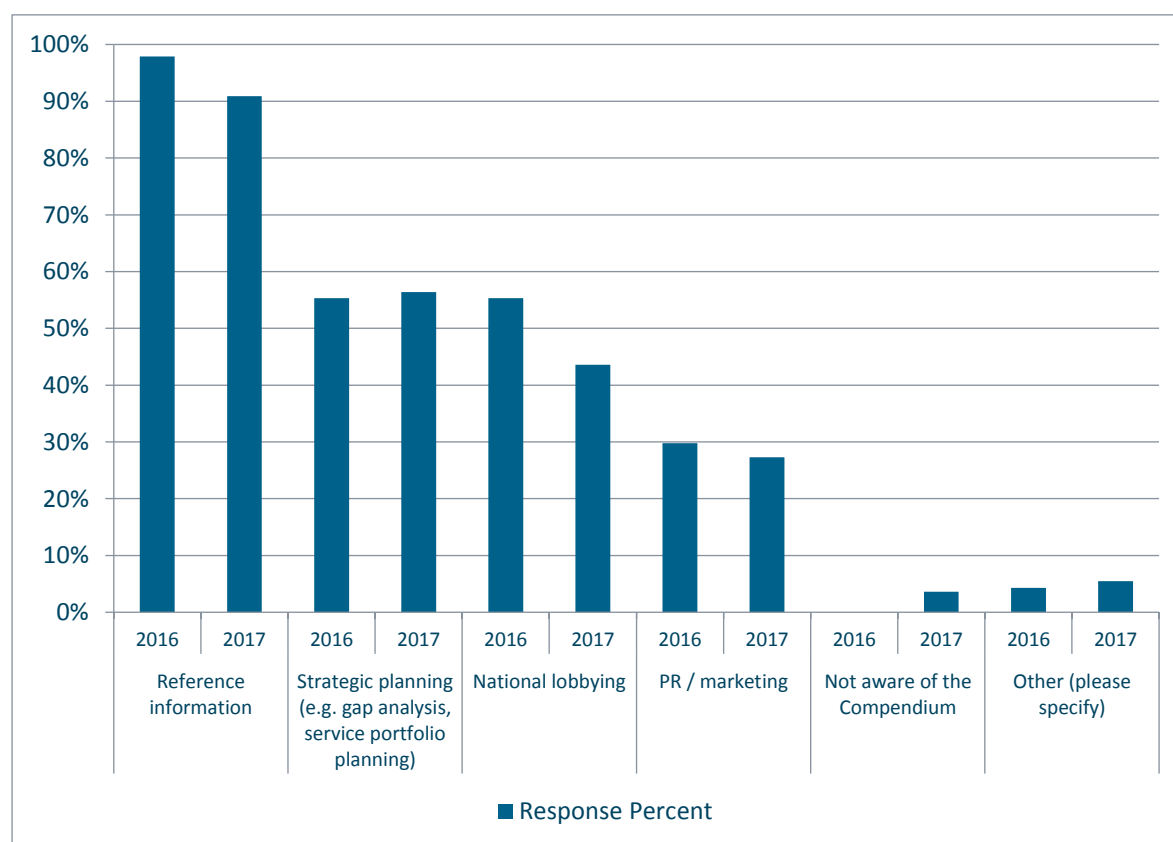
## 8 GÉANT Compendium

### 8.1 Overview

As the GÉANT Compendium has become an institution within the community, questions rating its importance and quality were removed in 2017 and the focus was placed on how it is used.

### 8.2 Results

Figure 8.1 below shows the NRENs' responses for how they use the GÉANT Compendium.



2016: n=47; 2017: n=55

Figure 8.1: 2016 and 2017 results for uses of the Compendium

## 8.3 Analysis

In 2017, 55 respondents answered this question, compared to 47 in 2016. Their answers remained relatively unchanged: the overwhelming majority use the Compendium as a reference tool, and it is clearly important in strategic planning and lobbying as well.

One community member commented that they did not rely on the Compendium because they felt that most of the information in it is incorrect, incomplete, or does not represent their NREN well. On the other hand, this realisation encouraged the NREN concerned to make a commitment to improve their input.

Those selecting “other” uses did not specify what they were.



## 9 User Input on Improvement

### 9.1 Overview

To conclude the survey, respondents were asked to enter free-text responses to this question:

**“And finally, if you haven’t had a chance to tell us earlier in the survey . . . Which one improvement could we make over the coming year that would help us better serve your NREN?”**

### 9.2 Results and Analysis

Eighteen of the 73 respondents chose to answer this question. The responses, of course, were as varied as the population. Some salient points to take into consideration included the following areas:

- GÉANT’s role as a resources and services integrator and developer.
- Cost models.
- Communications and information sharing.
- Cross-border fibre.
- Transnational education and digital divide.

Each of these is discussed below.

#### 9.2.1 GÉANT’s Role as a Resources and Services Integrator and Developer

One respondent commented that GÉANT, working with NRENS, is in a unique position to undertake the role of a strong and reliable integrator of resources and services across platforms, to address the variety of user choices in the European knowledge economy. To achieve this goal, technologies such as software-defined networking (SDN) and network function virtualisation (NFV), as well as the most up-to-date ICT service delivery models, are essential, along with operational and service delivery integration with other e-infrastructures and service providers. Also along these lines, it was suggested that GÉANT could become an acknowledged developer of over-the-top (OTT) services in order to promote best practices, develop technologies and innovate, so that the outcomes of GÉANT research can be reused in the NREN community.

## 9.2.2 Cost Models

Respondents commented that parts of the network infrastructure being provided by NRENs, or longer commitments to fibre contracts leading to reduced yearly costs, must be part of GÉANT's strategy and must show tangible results. Respondents expressed a desire for reduced connectivity costs and GÉANT subscription fees.

## 9.2.3 Communications and Information Sharing

There were calls for improving coordination with other e-infrastructures regarding communications with end-user communities. Several respondents expressed a desire for broader and better information sharing regarding technological decisions, and the need to make information more accessible regarding service status, as well as the need to revamp the GÉANT website and subsites to simplify access to up-to-date information.

## 9.2.4 Cross-Border Fibre

The need was expressed for high-quality regional connectivity studies to maximise the use of cross-border fibre.

## 9.2.5 Transnational Education and Digital Divide

A need for more proactive transnational education (TNE) initiatives, and to bridge the digital divide that still exists in the GÉANT network, were also noted.

## 10 Conclusions

Satisfaction remains stable at a high level across organisation, project, network operations and services, and, in general, there were only small deviations from the last survey.

The response rate of the 2017 NREN Satisfaction Survey validates the decision to make it as inclusive as possible. To build on this, and make the results more meaningful over time, the option for “no opinion” in specific areas will be continued for comparison going forward. Open-ended responses (such as “other”) for roles in the organisation must be eliminated if possible.

In order to carefully monitor and follow up on click and response rates, an attempt was made to require users to submit their name and position. Some respondents complied with this “soft” requirement, but most did not. While this prevented the desired accurate follow-up on responses per invitation, it proved that the need for anonymity is important, and this will be respected in future surveys in order to gather the most honest and candid responses possible.

With a slight decrease in excellence ratings, in general the views on quality were quite consistent, and high, across the community.

Specific highlights include:

- Services: Increased level of satisfaction with perfSONAR and Multi-Domain Virtual Private Network (MD-VPN).
- Project: Improved rating for project management.
- Events: Success of the new Digital Infrastructure for Research (DI4R) event.
- Organisation: The GÉANT organisation is meeting its users’ demands.
- Service portfolio: The GÉANT service portfolio is meeting current and future needs.

Areas where work is needed include:

- GÉANT Testbed Service.
- Service portfolio: Raising awareness of the services available, particularly security services and eduOER, providing up-to-date and complete service information for the entire portfolio, and making it easily accessible.
- Being more transparent about work distribution between NRENs in the management of the project.
- Meeting the needs of NRENs who require support for national promotions.
- Being more accessible for NRENs and strengthening a single point of contact
- Meeting the demand to address network security issues.

## 11 Next Steps

The results of this survey are being shared with the entire community, including:

- Service and Technology Forum.
- General Assembly (already done – at the GA meeting on 29–30 March 2017).
- Project Management Team and Activity Leaders.
- Subject matter experts.
- GÉANT staff (already done – an information-sharing event open to the whole organisation took place on 28 April 2017).

They will also feed into the wider intelligence gathering activities of NA3.

While the results show that constituents are in general satisfied, there is little or no room for GÉANT to “rest on its laurels”; users’ needs must be constantly monitored and relationships nurtured. Accordingly, based on the results and stakeholder feedback, improvement plans are being developed. Concrete actions being planned include:

- Prepare complete, up-to-date and tailored product marketing material for the entire service portfolio.  
This will help raise awareness of the services available, particularly security services, the GÉANT Testbed Service and eduOER, which should in turn help increase the uptake.
- Strengthen NA3 T1 as a single point of contact.  
To address any remaining issues from the merger that affect knowing who to contact at GÉANT, steps will be taken to strengthen the NA3 T1, also known as the Partner Relations team, as a single point of contact.
- Develop a national NREN support model that can be adapted to different NRENs.  
Partners expressed a continuing concern for bridging the digital divide and many indicated a need for GÉANT support for national promotion. The planned national NREN support model can be based on the experience of the Partner Relations team, supported by strong product marketing materials.
- Implement a General Assembly “ambassador” initiative.  
GÉANT has limited resources and cannot reach everyone. To supplement the work of GÉANT staff, national GA members could establish the position of the partnership more firmly and play a larger role to increase awareness about the project, service portfolio and other GÉANT assets across their NREN.
- Develop a unified communications model for the community.

A call for a unified communications strategy for the GÉANT brand has been addressed in community forums and was raised in the survey. Recognising the potential for conflicts with national interests, efforts to reach a consensus on a unified model for partners to integrate GÉANT branding should be formalised.

The Satisfaction Survey, like NA3's work in the GÉANT partnership in general, is a work in progress. There is a need to constantly strive for improvement and to achieve excellence.

## Appendix A Survey Response Details

This appendix gives the details behind the graphs in sections 3 to 8. It shows the number of responses received for each option within a question, including, where appropriate, “no opinion” or “not applicable”. It also shows, where appropriate, the number of respondents who skipped the question, and, for convenience, restates the total number of respondents who answered it (“n”).

The figures in the headings relate to the section number in which the related graph appears.

### A.1 GÉANT Organisation

#### 3.2.1. How satisfied are you with these GÉANT activities?

	Very satisfied		Satisfied		Dissatisfied		Very dissatisfied		N/A		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Managing the GÉANT (GN4-2) project and finances	11	12	28	45	4	1	0	0	0	3	43	61
Operating the GÉANT network and providing network services	24	22	23	34	0	0	0	0	0	4	47	60
Managing regional projects (e.g. AfricaConnect, EaPConnect)	13	10	23	27	4	1	0	0	0	20	40	58
Organising community knowledge sharing events and training (e.g. TNC, REFEDS)	24	18	22	34	1	2	0	0	0	5	47	59
Providing Middleware / AAI services	10	10	30	41	3	2	2	0	0	7	45	60
Running Task Forces and Special Interest Groups	16	8	29	40	0	4	0	0	0	5	45	57

2016: n=48; 2017: n=62

Table A.1: 2016 and 2017 results for satisfaction with GÉANT activities

### 3.3.1. I am confident in GÉANT's ability to serve its members in the best possible way.

	Response count	
	2016	2017
Strongly agree	20	14
Agree	26	46
Disagree	3	0
Strongly disagree	0	0
No opinion	-	1
Skipped question	0	12

2016: n=49; 2017: n=62

Table A.2: 2016 and 2017 results for confidence in GÉANT's ability to serve its members

### 3.4.1. How would you rate the following primary GÉANT functions:

	Excellent		Good		Below average		Poor		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
The value for money represented by GÉANT?	11	7	33	37	2	1	1	1	-	12	47	58
Education networking to the European Commission?	18	19	29	30	2	5	0	0	-	5	49	59
internationally/with global regional partners?	13	10	31	37	4	4	1	0	-	8	49	59
The effectiveness of General Assembly meetings as the main membership decision making forum?	5	6	27	15	6	11	2	2	-	24	40	58
Your experience with GÉANT's invoicing and billing process?	15	9	17	22	3	1	0	0	-	26	35	58
and activities?	12	11	33	36	1	8	0	1	-	3	46	59
Skipped question											0	14

2016: n=49; 2017: n=59

Table A.3: 2016 and 2017 results for rating six primary GÉANT functions

### 3.5.1. Do you use the following communication tools?

	Yes		No		Response count	
	2016	2017	2016	2017	2016	2017
geant.org website	47	59	2	1	49	60
Connect magazine	42	52	7	6	49	58
PeaR Community News	25	31	22	25	47	56
GÉANT Project Office News	42	45	6	13	48	58
GÉANT Facebook page	9	10	39	48	48	58
GÉANT Twitter page	6	17	43	40	49	57
GÉANT LinkedIn page	9	7	39	50	48	57

2016: n=49; 2017: n=60

Table A.4: 2016 and 2017 results for use of communication tools

### How often do you use it?

	Frequently		Occasionally		Rarely		Never		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
geant.org website	24	19	18	31	5	9	1	0	48	59
Connect magazine	5	15	23	23	15	13	1	1	44	52
PeaR Community News	17	19	7	9	3	5	6	11	33	44
GÉANT Project Office News	27	34	12	9	3	2	1	6	43	51
GÉANT Facebook page	1	2	1	2	6	5	13	27	21	36
GÉANT Twitter page	2	1	2	7	3	6	13	21	20	35
GÉANT LinkedIn page	0	0	2	3	7	5	13	25	22	33

2016: n=49; 2017: n=60

Table A.5: 2016 and 2017 results for how often communication tools are used



### How useful do you find it?

	Very useful		Somewhat useful		Not very useful		Not at all useful		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
geant.org website	23	16	18	32	4	7	2	1	-	2	47	58
Connect magazine	17	19	21	24	2	6	3	0	-	0	43	49
PeaR Community News	13	9	12	18	1	2	5	1	-	12	31	42
GÉANT Project Office News	24	32	17	12	1	1	0	0	-	4	42	49
GÉANT Facebook page	2	1	5	6	2	1	7	2	-	23	16	33
GÉANT Twitter page	-	1	6	9	1	2	6	1	-	19	14	32
GÉANT LinkedIn page	0	1	6	2	2	3	8	0	-	24	16	30

2016: n=49; 2017: n=60

Table A.6: 2016 and 2017 results for usefulness of communication tools

### 3.6.1 How satisfied were you with the following relating to your last interaction with GÉANT staff:

	Very satisfied		Satisfied		Dissatisfied		Very dissatisfied		N/A		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Your last interaction with GÉANT staff?	34	36	14	20	0	0	0	0	-	1	48	57
The ease of getting in touch with the right person at GÉANT?	34	27	14	28	0	0	0	0	-	2	48	57
concerns?	28	30	18	25	1	1	0	0	-	1	47	57
The level of knowledge of our staff?	30	29	18	23	0	1	0	0	-	4	48	57

2016: n=49; 2017: n=57

Table A.7: 2016 and 2017 results for satisfaction with GÉANT staff

## A.2 GN4-2 Project

### 4.2 How would you rate the following relating to the GN4-2 project?

	Excellent		Good		Below average		Poor		No opinion		Rating average		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
The overall project management?	16	14	24	34	1	2	1	0	-	8	-	3	42	58
The level of transparency of activity within the project?	6	7	31	28	4	11	2	1	-	11	-	3	43	58
Project administration (e.g. meetings, documents, reporting)?	10	11	30	31	3	3	0	0	-	12	-	3	43	57
Project communication (e.g. news, bulletins, information on activities)?	19	14	21	32	2	3	1	1	-	8	-	3	43	58
Coordination of pan-European user groups / projects on behalf of NRENs (e.g. EUMETSAT, LHCONE)?	5	3	24	18	3	4	0	1	-	31	-	3	32	57
The GÉANT Partner Relations team as a single point of contact for NREN liaison and support?	23	20	16	19	1	2	0	0	-	18	-	3	40	59
Skipped question													-	14

2016: n=45; 2017: n=59

Table A.8: 2016 and 2017 results for satisfaction with the management of the GN4-2 project

## A.3 Satisfaction with the GÉANT Network and Operations

### 5.2.1 How would you rate the following relating to the GÉANT network:

	Excellent		Good		Below average		Poor		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
The overall performance and reliability of the GÉANT network?	35	33	12	21	0	0	0	0	-	5	47	59
The operation and management of the GÉANT network?	30	28	15	24	1	0	0	0	-	7	46	59
GÉANT connectivity with global R+E networks (e.g. Internet2, TEIN)?	29	22	15	24	1	0	0	0	-	13	45	59
The GÉANT Service and Technology Forum for APMs to receive and share information?	16	13	20	21	3	1	0	0	-	24	39	59
The ability of the GÉANT Operations Centre to respond to technical issues?	17	18	20	20	3	0	0	0	-	20	40	58
Skipped question											-	14

2016: n=47; 2017: n=59

Table A.9: 2016 and 2017 results for rating the GÉANT network

### 5.4.1 How would you rate these aspects of network security?

	Excellent		Good		Below average		Poor		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
The security level of the GÉANT network?	6	8	27	25	0	1	0	0	-	19	33	53
GÉANT CERT's handling of security incidents?	8	7	17	14	0	2	0	0	-	33	25	56
Skipped question											-	17

2016: n=33; 2017: n=56

Table A.10: 2016 and 2017 results for rating network security

## A.4 Satisfaction with the GÉANT Service Portfolio

### 6.2.1 Does GÉANT's service portfolio meet your NREN's current and future needs?

	Yes		No		Response count	
	2016	2017	2016	2017	2016	2017
Current needs?	46	43	2	3	48	46
Future needs (5 year outlook)?	29	28	14	10	43	38
Skipped question					1	27

2016: n=48; 2017: n=46

Table A.11: 2016 and 2017 results for overall service portfolio

### 6.3.2.1 How would you rate the quality of these network-based services?

	Very high quality		High quality		Low quality		Very low quality		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
GÉANT IP	32	29	7	11	0	0	0	0	-	2	39	42
GÉANT World Service	18	17	12	10	0	0	0	0	-	9	30	36
GÉANT Peering	11	13	18	14	0	0	0	0	-	5	29	32
GÉANT Plus	6	7	9	6	0	0	0	0	-	11	15	24
GÉANT Lambda	2	3	6	4	0	0	0	0	-	16	8	23
GÉANT Open	0	0	3	1	0	0	0	0	-	18	3	19
L3-VPN	2	3	7	4	1	0	0	0	-	14	10	21
MD-VPN	3	8	9	6	2	0	0	0	-	10	14	24
GÉANT Testbed Service	2	2	6	4	1	3	0	0	-	14	9	23
perfSONAR	0	3	10	15	6	2	1	0	-	9	17	29
Skipped question											-	22

n=	GÉANT IP	GÉANT World	GÉANT Peering	GÉANT Plus	GÉANT Lambda	GÉANT Open	L3-VPN	MD-VPN	GÉANT Testbed Service	perfSONAR
2016	39	30	29	15	8	3	10	14	9	17
2017	40	27	27	13	7	1	7	14	9	20

Table A.12: 2016 and 2017 results for quality of network-based services

#### 6.4.1 Does your NREN plan to deploy software-defined networking (SDN) in the next 12–18 months?

	Response count	
	2016	2017
Yes	14	19
No	30	23
Already deployed	-	2
Skipped question	5	29

2016 and 2017: n=44

Table A.13: 2016 and 2017 results for planned deployment of SDN

#### 6.5.2.1 How would you rate the quality of these trust, identity and security services?

	Very high quality		High quality		Low quality		Very low quality		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
eduGAIN	11	13	19	25	1	0	0	0	-	5	31	43
eduroam	24	28	13	21	0	0	0	0	-	1	37	50
eduPKI	3	3	3	5	2	1	0	0	-	19	8	28
TCS	12	13	9	14	1	1	1	0	-	5	23	33
FaaS	1	1	3	5	0	0	0	0	-	17	4	23

n=	eduGAIN	eduroam	eduPKI	TCS	FaaS
2016	31	37	8	23	4
2017	38	49	9	28	6

Table A.14: 2016 and 2017 results for quality of trust, identity and security services

### 6.6.2.1 How important is the GÉANT Cloud Catalogue for your NREN?

Very important		Important		Somewhat important		Not important		No opinion		Response count	
2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
6	8	7	12	2	7	1	1	-	4	16	32

2016: n=16; 2017: n=28

Table A.15: 2016 and 2017 results for importance of the Cloud Catalogue

### 6.7.2.1 How would you rate the quality of these RTC services?

	Very high quality		High quality		Low quality		Very low quality		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
eduOER	1	2	3	4	0	2	0	0	-	13	4	21
NRENum.net	4	5	5	5	0	0	0	0	-	11	9	21

n=	eduOER	NRENum.net
2016	4	9
2017	8	10

Table A.16: 2016 and 2017 results for quality of RTC services

## A.5 Collaboration and Community Activities

### 7.2.1 Does your NREN attend these collaboration and community events?

	Yes		Sometimes		No		Unaware of this event/these events		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Task Forces / Special Interest Groups	25	33	17	17	6	5	0	0	48	55
TNC	36	47	7	6	3	2	0	1	46	56
REFEDS meetings	13	22	7	6	12	15	7	5	39	48
Knowledge transfer events	7	9	20	19	6	8	7	11	40	47
Training workshops	10	15	29	22	2	6	3	4	44	47
DI4R-Digital Infrastructure for Research	0	12	0	4	0	21	0	6	0	43

2016: n=48; 2017: n=56

Table A.17: 2016 and 2017 results for attendance at collaboration and community events

### 7.3.1 How important are these collaboration and community events to your NREN?

	Very important		Important		Somewhat important		Not important		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Task Forces / Special Interest Groups	15	21	24	19	4	10	0	0	-	2	43	52
TNC	21	23	16	20	6	8	0	0	-	1	43	52
REFEDS meetings	7	6	12	16	2	5	0	1	-	11	21	39
Knowledge transfer events	11	7	12	13	3	8	0	0	-	11	26	39
Training workshops	13	11	19	18	5	7	0	0	-	5	37	41
DI4R-Digital Infrastructure for Research	0	8	0	8	0	2	0	1	-	9	0	28

2016: n=48; 2017: n=56

Table A.18: 2016 and 2017 results for importance of collaboration and community events

### 7.4.1 How would you rate the quality of these collaboration and community events?

	Very high quality		High quality		Low quality		Very low quality		No opinion		Response count	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
Task Forces / Special Interest Groups	11	9	24	33	0	1	0	0	-	4	35	47
TNC	21	18	14	25	1	3	0	0	-	2	36	48
REFEDS meetings	4	4	11	15	0	1	0	0	-	14	15	34
Knowledge transfer events	7	3	12	13	1	1	0	0	-	16	20	33
Training workshops	11	3	21	19	0	1	0	0	-	13	32	36
DI4R-Digital Infrastructure for Research	0	4	0	6	0	1	0	0	-	13	0	24

2016: n=48; 2017: n=56

Table A.19: 2016 and 2017 results for quality of collaboration and community events



## A.6 GÉANT Compendium

### 8.2 What does your NREN use the GÉANT Compendium for?

	Response count	
	2016	2017
Reference information	46	50
Strategic planning (e.g. gap analysis, service portfolio planning)	26	31
National lobbying	26	24
PR / marketing	14	15
Not aware of the Compendium	0	2
Other (please specify)	2	3
Skipped question	2	18

2016: n=47; 2017: n=55

Table A.20: 2016 and 2017 results for uses of the Compendium

## References

<b>[Cloud Catalogue]</b>	<a href="https://clouds.geant.org/">https://clouds.geant.org/</a>
<b>[Firewall-on-Demand]</b>	<a href="https://www.geant.org/Networks/Network_Operations/Pages/Firewall-on-Demand.aspx">https://www.geant.org/Networks/Network_Operations/Pages/Firewall-on-Demand.aspx</a>
<b>[GÉANT website]</b>	<a href="https://www.geant.org/Services/Real-time_communications">https://www.geant.org/Services/Real-time_communications</a>
<b>[NSHaRP]</b>	<a href="http://www.geant.org/Networks/Network_Operations/Network_Security">http://www.geant.org/Networks/Network_Operations/Network_Security</a>
<b>[Real-time communications]</b>	<a href="https://www.geant.org/Services/Real-time_communications">https://www.geant.org/Services/Real-time_communications</a>
<b>[SurveyMonkey]</b>	<a href="http://www.surveymonkey.com/">http://www.surveymonkey.com/</a>

## Glossary

<b>AAI</b>	Authentication and Authorisation Infrastructure
<b>API</b>	Application Program Interface
<b>APM</b>	Access Port Manager
<b>CEO</b>	Chief Executive Officer
<b>CERT</b>	Computer Emergency Response Team
<b>CSIRT</b>	Computer Security Incident Response Team
<b>DDoS</b>	Distributed Denial of Service
<b>DI4R</b>	Digital Infrastructure for Research
<b>EC</b>	European Commission
<b>EUMETSAT</b>	European Organisation for the Exploitation of Meteorological Satellites
<b>FaaS</b>	Federation as a Service
<b>FoD</b>	Firewall on Demand
<b>GA</b>	General Assembly
<b>IaaS</b>	Infrastructure as a Service
<b>ICT</b>	Information and Communications Technology
<b>ITSM</b>	IT Service Management
<b>L3</b>	Layer 3
<b>LHCONE</b>	Large Hadron Collider Open Network Environment
<b>MD-VPN</b>	Multi-Domain Virtual Private Network
<b>NA</b>	Networking Activity
<b>NA3 T1</b>	NA3 Task 1 European and Global NREN Account Management
<b>NA3</b>	Networking Activity 3 Partner, User and Stakeholder Relations
<b>NFV</b>	Network Function Virtualisation
<b>NREN</b>	National Research and Education Network
<b>NSHaRP</b>	Network Security Handling and Response Process
<b>OC</b>	Operations Centre
<b>OER</b>	Open Educational Resources
<b>OTT</b>	Over-the-Top (content)
<b>P2P</b>	Point-to-point
<b>PeaR</b>	The news service by and for the research and education networking community
<b>PRACE</b>	Partnership for Advanced Computing in Europe
<b>R&amp;E</b>	Research and Education
<b>REFEDS</b>	Research and Education Federations
<b>RTC</b>	Real-time Communications
<b>SDN</b>	Software-Defined Networking
<b>SIG</b>	Special Interest Group
<b>STF</b>	Service and Technology Forum
<b>TCS</b>	Trusted Certificate Service

<b>TF</b>	Task Force
<b>TNC</b>	The Networking Conference
<b>TNE</b>	Transnational Education
<b>VoIP</b>	Voice over IP
<b>VPN</b>	Virtual Private Network