

05-01-2023

Deliverable D3.8

Community Programme Impact Report

Deliverable D3.8

Contractual Date:	31-12-2022
Actual Date:	05-01-2023
Grant Agreement No.:	856726
Work Package	WP3
Task Item:	Task 4
Nature of Deliverable:	R (Report)
Dissemination Level:	PU (Public)
Lead Partner:	GÉANT Association
Document ID:	GN4-3-22-D4DA23
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The research leading to these results has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 856726 (GN4-3).

Abstract

This deliverable describes the activities and impact of the GÉANT Community Programme over the four-year period of GN4-3. It covers strategy; the GCP's oversight body, the GÉANT Community Committee; GCP portfolio instruments and thematic areas; development areas; activities in support of each thematic area, and their impact and reach; the concept, implementation, results and impact of the GÉANT Innovation Programme and GÉANT Community Award; and communications.

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Executive Summary

This deliverable describes the activities and impact of the GÉANT Community Programme (GCP) over the four-year period of GN4-3 (January 2019 – December 2022). It covers strategy; the GCP’s oversight body, the GÉANT Community Committee (GCC); GCP portfolio instruments and thematic areas; development areas; activities in support of each thematic area, and their impact and reach; the concept, implementation, results and impact of the GÉANT Innovation Programme and GÉANT Community Award; and communications.

The GÉANT Community Programme is a grassroots, voluntary initiative involving experts from National Research and Education Networks (NRENs), end-user organisations and the commercial and industrial sector, from both within and outside Europe. Its goal, as defined in its strategy, is “to be the primary forum for enabling and fostering collaboration and harmonisation in the R&E networking community, furthering development and progress in Internet technology, infrastructure, R&E services, digital transformation and activities, and of the research and education community itself”. The long-term strategy, developed to complement the GÉANT Association strategy, also sets out the GCP’s vision, mission, objectives and actions, the role of its oversight body, the GÉANT Community Committee, and its process for developing innovation.

The GCP has developed in various areas during GN4-3, including in its reporting; the introduction of one-off workshops; the introduction of the GÉANT Innovation Programme; improving the process and profile of the GÉANT Community Award; changes in its portfolio; and changes to the way it functioned in response to COVID-19.

The main instruments in the GCP portfolio are Task Forces (TFs), Special Interest Groups (SIGs), workshops and training, collaborative activities and services. The thematic areas supported by the GCP are formed and continuously evolve from the needs of the GÉANT community. The areas supported as at the end of GN4-3, and their primary groups, are as follows:

- **Security**
 - Special Interest Group on Information Security Management (SIG-ISM) [[SIG-ISM](#)].
 - Task Force on Computer Security Incident Response Teams (TF-CSIRT) [[TF-CSIRT](#)].
 - Wise Information Security for Collaborating e-Infrastructures (WISE) Community [[WISE](#)].

- **Identity & Privacy**
 - Task Force on Distributed Ledger Technologies (TF-DLT) [[TF-DLT](#)].
 - Global eduroam Governance Committee (GeCC) [[GeCC](#)].
 - Research and Education FEDerations (REFEDS) [[REFEDS](#)].

- **Education**
 - Task Force on Educational activities and services (TF-EDU) [[TF-EDU](#)].
- **Network Services and Technologies**
 - Special Interest Group on Next-Generation Networks (SIG-NGN) [[SIG-NGN](#)].
 - Special Interest Group on Network Operations Centres (SIG-NOC) [[SIG-NOC](#)].
- **Media Services**
 - Special Interest Group on Multimedia Applications (SIG-Multimedia) [[SIG-Multimedia](#)].
 - Network Performing Arts Production Workshop (NPAPWS) [[NPAPWS](#)].
- **Cloud Services**
 - Special Interest Group on Cloud Interoperable Software Stacks (SIG-CISS) [[SIG-CISS](#)].
 - Open Cloud Mesh (OCM) [[OCM](#)].
- **Organisational Services**
 - Special Interest Group on Marketing Communications (SIG-Marcomms) [[SIG-Marcomms](#)].
 - Special interest Group on Management of Service Portfolios (SIG-MSP) [[SIG-MSP](#)].
 - Public Affairs Workshop (PAW) [[PAW](#)].
- **Support Services**
 - Task Force on Research Engagement Development (TF-RED) [[TF-RED](#)].
- **Health Services**
 - Task Force on eHealth (TF-eHealth) [[TF-eHealth](#)].

Over the four years of GN4-3, the GCP organised 123 TF/SIG meetings, workshops and events with a total of 7,283 participants from 77 different countries and also from international organisations and companies. The value of the GCP activities has been summarised by a range of TF/SIG Chairs and Steering Committee members and GCC members in an ongoing series of “impact interviews”.

Key GPC achievements during GN4-3 include:

- 123 TF/SIG meetings, workshops and events were held with a total of 7,283 participants from 77 different countries, from within and outside Europe, and also from international organisations.
- openUp2U was developed and offered to all schools and universities across Europe in direct response to the COVID-19 pandemic. openUp2U was a digital learning environment, including tools for course management, videoconferencing and file sharing that were integrated into a learning management system [[openUp2U](#)].
- The “Community Action Aid – URAN” collaborative project was created, as part of immediate and structural community efforts to support Ukrainian colleagues following the Russian invasion of Ukraine [[CAAU](#)].
- Three new expert group activities were created based on needs raised by the research and education community. These groups are the Task Forces on Educational Activities and Services

(TF-EDU) [[TF-EDU](#)], Distributed Ledger Technologies (TF-DLT) [[TF-DLT](#)] and eHealth (TF-eHealth) [[TF-eHealth](#)].

- The GÉANT Community Programme strategy was produced [[GCPS](#)], defining and formalising the GCP's vision, goal, mission and objectives and outlining the strategic framework governing its activities.
- The GÉANT Innovation Programme was established [[GIP](#)]. The GIP delivers value and impact through helping new ideas from NRENs and their member institutions to become completed projects that can potentially provide benefit to the GÉANT and wider research and education community. Results from the 2021 programme have already been incorporated into services (e.g. eduMEET) and have produced valuable lessons learned.
- The process for the GÉANT Community Award was improved, making it more engaging and transparent, and the Award's profile raised [[GCA](#)]. As a result, the number of nomination submissions received increased by more than 50%. The process enhancements give the GÉANT and wider R&E community a greater sense of ownership of the Award, and help ensure due recognition (in terms of both honouring and raising awareness) for its members and their outstanding contributions.
- The TF-CSIRT Futures Working Group published an RFQ to look at a future legal structure for TF-CSIRT, to ensure that the CSIRT community is supported in the most effective way going forward.
- The first of the new TRANSITS materials was published under Creative Commons on the TF-CSIRT website [[TF-CSIRT_TRANSITS_Mats](#)], making this high-quality training more widely available.
- Research Engagement Blueprint document was created [[TF-RED_REB](#)], to help community members new to the field of research engagement.
- A yearly overview of European NREN educational activities and services was created, to help identify common challenges and strategic goals.

The developments to the GÉANT Community Programme during GN4-3, together with the high volume of meetings, workshops, trainings, events – both online and face-to-face – and communications, mean that it continues to be an invaluable framework for connecting people, sharing experiences, leveraging knowledge, enabling collaboration, and fostering innovation across R&E.

1 Introduction

Collaboration across experts in different geographic locations and disciplines is crucial to the GÉANT community. The GÉANT Community Programme (GCP) was established in early 2016 under Terms of Reference agreed by the GÉANT General Assembly to foster collaboration and support community-driven initiatives in a broad range of thematic areas, including innovation, management and operation, for the National Research and Education Networks (NRENs) and GÉANT to build communities, share ideas and solve common issues [[GA\(15\)046](#)].

Both replacing and extending the functionality of the TERENA Technical Programme, the GÉANT Community Programme is a grassroots, voluntary initiative built by world experts from NRENs, user organisations, research institutions, commercial and industrial sectors both within and outside Europe, and including international bodies. Indeed, the Programme is unique in that it is open to all community members, not only those who are primarily Europe based; this global reach allows a very wide cross-fertilisation and exchange of knowledge and experiences. The main instruments through which the GCP operates are Task Forces (TFs), Special Interest Groups (SIGs), workshops and training, and collaborative activities and services. These provide an effective framework for GÉANT, NRENs and other R&E bodies to collaborate and to share experiences, information and best practices. TFs and SIGs also provide a forum to discuss possible innovations and further developments of services, meaning the GCP has a role to play in guiding future developments of networking services, technology and also a variety of non-technical topics for the GÉANT community.

Participating in the GCP – collaborating and sharing knowledge, experience, best practice and ideas, facilitated by GÉANT – helps the NRENs carry out their business and serve their users in the most informed, effective and beneficial way, and helps them support each other to do the same.

The GÉANT Community Programme is an open initiative and as such its wiki space [[GCP wiki](#)] and all associated papers are publicly available.

This document:

- Presents key elements of the GCP strategy (Section 2).
- Introduces the body which oversees the GCP, the GÉANT Community Committee (Section 3).
- Outlines the main instruments in the GCP portfolio and the thematic areas currently supported (Section 4).
- Summarises the GCP developments that have taken place during GN4-3 (Section 5).
- Presents a summary of the activities that have taken place in GN4-3 to support each thematic area, and an assessment of their impact and reach (Section 6).
- Describes the concept, implementation, results and impact of the GÉANT Innovation Programme and GÉANT Community Award (Sections 7 and 8).

- Summarises the concept, implementation and results of the GCP-related communications (Section 9).
- Draws together and assesses the key points (Section 10).

2 GÉANT Community Programme Strategy

In 2019 the GÉANT Community Committee (GCC) recognised the need for a long-term strategy for the Community Programme, to sit alongside the general GÉANT Association strategy, and in 2020 a new long-term strategy was adopted [\[GCPS\]](#). This section presents some of the key elements of the strategy, namely vision and goal, mission, objectives and actions, and the role of the GÉANT Community Committee (GCC).

2.1 Vision and Goal

The vision the GÉANT Community Programme aspires to realise is:

A connected, collaborative and harmonised research and education networking community.

Its goal is to be the primary forum for enabling and fostering collaboration and harmonisation in the R&E networking community, supporting the NRENs to carry out their business and serve their users in the most informed, effective and beneficial way, furthering development and progress in Internet technology, infrastructure, R&E services, digital transformation and activities, and of the research and education community itself.

2.2 Mission

The mission of the GÉANT Community Programme, which will enable it to achieve that goal, is to:

Provide optimal conditions for the R&E networking community to collaborate both face-to-face and virtually.

This involves creating mechanisms to enable participation and inclusion, delivering a roadmap that identifies topics and trends of strategic importance (including input from the community), and providing guidance to GÉANT and the community.

2.3 Objectives and Actions

The specific objectives by which the GÉANT Community Programme fulfils its mission are:

- Identify and share areas and trends benefiting NRENs and the wider R&E community.

- Manage the lifecycle of groups and activities.
- Connect people to the right human network.
- Support methods of eliminating gaps within the R&E community.
- Facilitate collaborations.
- Raise awareness about the GÉANT Community Programme.
- Facilitate knowledge transfer.

Each of these is described in more detail below, outlining the actions the GÉANT Community Committee (GCC) and community are taking or will take in order to realise each objective. The results and achievements of the work are overseen and assessed regularly to ensure the fulfilment and continuous progress of the strategy.

- **Identify and share areas and trends benefiting NRENs and the wider R&E community.**

The GCC annually provides recommendations from the wider R&E community (via the TFs/SIGs, community platform and various expert networks) to the GÉANT Association and the General Assembly. These recommendations provide input for the annual outreach plan and the GÉANT Compendium.

- **Manage the lifecycle of groups and activities.**

The GCC identifies the process for creating, running and terminating groups and activities, and produces and disseminates guidelines. Through its communication channels and network of people, it gathers input from the community, which leads to new groups or activities. The GCC also fosters the incubation process from SIGs through TFs to concrete projects.

The GCC oversees the creation and termination of groups and activities on a continuous basis and sets priorities within the Programme.

- **Connect people to the right human network.**

The GÉANT Association team responsible for supporting the GÉANT Community Programme creates and maintains a continuously updated overview of activities and human networks, and guides people and ideas to the relevant group, facilitating knowledge exchange and the creation of communities of interest.

- **Support methods of eliminating gaps within the R&E community.**

The GÉANT Association, in conjunction with the NRENs through their participation in TF/SIG meetings and the GCC, identifies methods to ensure gaps are filled or mitigated. These may relate to funding issues as well as knowledge transfer.

- **Facilitate collaborations.**

The GCC provides guidelines, best practices, facilities and checklists for virtual and face-to-face meetings to enable equal participation. This covers the role of the chair/coordinator and communication guidelines as well as the technical elements.

- **Raise awareness about the GÉANT Community Programme.**

The GÉANT Association communications team creates an annual outreach plan and materials to ensure that the Community Programme is well-known and visible within and outside of the R&E community. These also make it clear how newcomers can contact the Community Programme.

- **Knowledge transfer.**

The GÉANT Association organises, in coordination with NREN experts, training seminars and staff exchanges (staff temporarily hosted by another NREN), writes best practices (both technical and procedural), tags all existing documentation (including GNx Deliverables) to make it a searchable database, maintains a list of experts, and organises a newcomers programme at TNC.

2.4 GÉANT Community Programme Innovation and Service/Product Lifecycle

The GÉANT Community Programme has defined a process for developing innovations that may arise during the course of its activities from idea to project to service.

The four main stages of innovation are usually identified as:

1. **Ideation** – basic research and conception.
2. **Project Selection** – the decision to develop an idea further (invest people, time and money).
3. **Product Development** – building the product or service.
4. **Operationalisation** – bringing the product or service to market and adapting it to customer demands.

All four stages need to be sufficiently supported within an organisation for innovation to systemically happen. One of the prerequisites of innovation and service development is analysis of improvement opportunities, gathering the ideas. For this stage, having a systematic ideation process is key.

In the GÉANT community ecosystem, the way ideas turn into results is often similar to the schema shown in Figure 2.1 below:



Figure 2.1: Example GÉANT Community Programme ideation process

Currently, new ideas in the GÉANT community come either from individual members of NRENs or from TFs, SIGs and workshops on specific topics. They are also supported through the GEANT Innovation programme, Incubator programme in the GN4-3 project and through roadmapping and white paper processes to ensure a continuous innovation and evolution of services cycle. Additionally, the GCC inputs, on behalf of the R&E Community into the Project Annual Internal Review (PAIR) process.

GÉANT Community Committee Role in the Services / Product Lifecycle

There are two areas of service/product development in the GÉANT community to which the GÉANT Community Committee (GCC) (see Section 3) can significantly contribute: systematic ideation and also a phase-out process (decision that a service has expired).

In addition to the processes already in place, the GCC have taken a strategic role in the idea-gathering and coordination process by:

1. Annual analysis of technological trends and innovations with particular relevance to the GÉANT community, producing white papers and/or position papers.
2. Providing clear channels to systematically gather innovation ideas within TFs, SIGs and NRENs. The GCC is also considering the idea of an electronic “idea submission box” for gathering individual ideas.
3. Providing a screening and filtering process for ideas gathered, as well as coordinating TFs and SIGs in selecting and further developing ideas.

For an account of how the GÉANT Community Programme fosters innovation through the GÉANT Innovation Programme, see Section 7.

3 GÉANT Community Committee

The GÉANT Community Committee (GCC) has oversight of the GÉANT Community Programme. This section presents an overview of the GCC's governance structure, its objectives, and its members' role and responsibilities.

3.1 Governance Structure

The GÉANT Community Committee operates under the auspices of the GÉANT General Assembly via agreed terms of reference (see [\[GA\(15\)046 GCPToR\]](#) p. 2, #9). The Chair of the GCC is an NREN representative, elected by the General Assembly; the Committee's 6–8 members, who represent key expertise areas and/or communities, are appointed by the GÉANT Board of Directors based on input provided by the Chair in consultation with the GÉANT Executive Team.

The GCC is usually closely associated with a community-focused Task within a Work Package of the current GÉANT project.

3.2 Objectives

The objectives of the GCC are to:

- Provide help, to NRENs that request it, with providing services for students, lecturers and scientists by, for example, sharing ideas, best practices, advising on harmonising procedures or technology selection, or jointly tackling an issue.
- Assist GÉANT in matters related to community-driven collaborative initiatives.
- Provide oversight of the evolution of the GCP, guidance on TFs/SIGs (based on their scorecards) and the overall direction of the Programme, and advice to GÉANT management on the execution of the Programme.

The GCC also has a role to play in the GÉANT community innovation and service/product lifecycle, as described in Section 2.4.

3.3 Members' Role and Responsibilities

Following the development of the GÉANT Community Programme Strategy, the GCC has also reviewed and redefined the role and responsibilities of the Committee members.

The objectives of the Committee members' role are to:

- Create an umbrella view for the GÉANT Association and the GÉANT community about specific thematic areas that are under the portfolio expertise.
- Liaise with experts from the field internally and externally (GÉANT project, GCP, EC, research organisations, industry, etc.) to ensure trends and challenges are integrated with the strategic direction of GÉANT.

The essential responsibilities/requirements of members are:

- Be considered as a subject matter expert in a thematic area with a broad network within and ideally also outside of the broader GÉANT community.
- Advise the GCC in relation to the area of expertise the member represents in terms of trends, emerging topics, issues, activities and lifecycle.
- Be able to represent a portfolio of TFs/SIGs related to the area of expertise, to:
 - Follow the respective GCP activities and liaise with steering committees and coordinators of those activities (corresponding to the expertise area the GCC member represents).
 - Act as a bridge for the topic area between the GCP activity and the GÉANT project/organisation and facilitate harmonisation of activities.
 - Provide oversight of TF/SIG performance related to meeting expectations (linked to scorecard).
 - Support coordinators in identifying trends, introducing content for planning of programme of the activity.
- Contribute to the GCP annual review with the GÉANT Board on the GCP activities the GCC member represents with insight and recommendations for trends, challenges and issues.
- Act as a Community Programme ambassador – strategy/promotion/success of the GCP (TFs/SIGs, Innovation Programme, Community Award, new initiatives) – on a global basis.
- Support the GCC Chair/Co-chair as required.
- Within the Innovation Programme, provide mentorship for the subject matter area the Committee member represents, providing a liaison role between the GCP activities and the respective project, and providing recommendations for continuity.

Additional responsibilities for the Chair and Co-chair are:

- GÉANT Exec interaction – the Co-chair of the GCC serves as a conduit to the GÉANT Executive Team.
- GÉANT project coordination – the Chair of the GCC ensures timely coordination with the GÉANT project.

4 GÉANT Community Programme Portfolio

This section outlines the main instruments in the GÉANT Community Programme portfolio: Task Forces (TFs), Special Interest Groups (SIGs), workshops and training, collaborative activities and services. All activities fall within the currently supported thematic areas, which are also described, and have significant global, not solely European, participation.

4.1 Instruments

4.1.1 Task Forces

TFs are fixed-term, typically short-lived community-based collaboration activities, undertaken largely by volunteers who work together on specific tasks to produce tangible deliverables. Formal processes are in place for establishing, running and dissolving a Task Force, together with standard terms of reference that determine aspects such as the role of the chair and secretary, meeting frequency, deliverables, length of mandate and mailing list. (Exceptions to the “short-lived” characteristic include the Task Force on Computer Security Incident Response Teams (TF-CSIRT).)

4.1.2 Special Interest Groups

SIGs are similar constructs to Task Forces, in that they are also community-based and largely volunteering activities, but focus on community building, best-practice dissemination and knowledge exchange rather than on tasks and deliverables. Like Task Forces their lifecycle is governed by formal processes and standard terms of reference. SIGs are normally of longer duration than TFs, and are led by a Steering Committee rather than a chair.

4.1.3 Workshops and Training

One-off or series of community-based workshops, (un)conferences or Birds of a Feather sessions (BoFs) may be organised around a specific topic of interest. Workshops may lead to recommendations for establishing further, follow-up activities. These may be captured in a workshop (or series of workshops) closing report.

4.1.4 Collaborative Activities

The GCP provides a framework of secretariat, coordination and administrative support for a broad range of collaboration activities of interest to GÉANT. These can be small or large, often global,

collaborations or specific components of such activities initiated by members or individuals from the community and administered/commissioned by the GÉANT Association.

GÉANT provides support to a variety of collaborative activities that are important to the community in order to ensure that they have the necessary coordinators and infrastructure to function well. In essence, the support provided is very similar to that for a TF or SIG – normally in the form of a professional secretariat for the collaboration – but these collaborations are typically self-sustained by the community and funding (if any) is not from the EC. Current collaborations supported include Research and Education FEDerations (REFEDS), Wise Information Security for Collaborating e-Infrastructures (WISE) and the Global eduroam Governance Committee (GeGC). Support for these collaborations includes some or all of the following functions:

- Coordinator role.
- Meeting support (both virtual and face-to-face).
- Invoicing (REFEDS).
- Infrastructure support (wiki, website, mailing lists, hosting, VC).

4.1.5 Collaborative Services

Through its TFs, SIGs and collaborative activities, the GÉANT Community Programme can identify activities within the supported thematic areas that are of a service nature and that benefit the community as a whole. GÉANT provides support to the Community Programme to confirm the viability of such services and support their incubation, with the intent to make such services self-sustaining. The services should be inclusive, and intended to be open and accessible to all participants in the community at large. The Community Programme, together with the materially contributing stakeholders of the service, will advise on the strategic direction and development of the services so created.

4.2 Thematic Areas

Thematic areas are formed and continuously evolve from the needs of the GÉANT community. The areas supported as at the end of GN4-3 are as follows. A table showing the related TFs, SIGs, workshops and collaborative activities is given in Appendix A.

- **Security**
This is a broad area, concerned with the confidentiality, integrity and availability of information and information systems. GÉANT's activities include defining and implementing appropriate security requirements for various types of systems. One requirement common to many systems is incident response: detecting and investigating failures and restoring the system to its intended security state.
- **Identity & Privacy**
Middleware is a general term that in this context refers to the layer between the network and the applications running on it. Middleware provides an interface to, and between, the applications, easing their interoperability, simplifying access by users, and allowing better management. GÉANT's middleware activities focus on identity management federations,

harmonisation and standardisation of interfaces, access control, service location and diagnostics, and involve liaison with other communities when relevant. This area also addresses user and application mobility in a networked environment.

- **Education**

This activity focuses on collaboration across the education sector on commonly identified topic areas, providing a coordinated approach to improve NREN educational services and activities.

- **Network Services and Technologies**

This area is concerned with organisational aspects, coordination and exchange of best practice regarding the provisioning and delivering of network services. Work in this area supports research on network technology and innovative network services. Campus networking is included in this area.

- **Media Services**

This area encompasses information exchange and best practice in traditional and web-based collaboration, webcasting and video-on-demand solutions, while at the same time providing a platform for activities supporting live media and videoconferencing. GÉANT's activities in this field vary from the investigation of next-generation real-time communication services to the establishment of rich media production and recording solutions, metadata and content repositories as well as distribution platforms.

- **Cloud Services**

Virtualisation generally refers to abstraction of resources, usually creating a logical view of resources while hiding the underlying arrangement of various physical elements including storage, hardware, servers and networking components. This area also includes the investigation of in-house services using private clouds and of services outsourced to public clouds.

- **Organisational Services**

This activity deals with organisational, information gathering/exchange and delivery aspects of services provided to the community and by the community.

- **Support Services**

This area caters for the support requirements of end users and the community at large with the aim to develop a framework for research engagement.

- **Health Services**

This area is aimed at enhancing coordination, exchange of best practices and sharing knowledge among the NRENs and the activities they are individually carrying out to support their eHealth User Communities.

These thematic areas are also shown on the GÉANT Community website [\[TA\]](#).

5 GÉANT Community Programme Development during GN4-3

In addition to developing the strategy outlined in Section 2, and reviewing and redefining the GCC members’ role and responsibilities (described in Section 3.3), the GÉANT Community Programme has developed in various other areas during GN4-3, namely reporting, activity mapping, one-off workshops, introducing the GÉANT Innovation Programme, improving the process and profile of the GÉANT Community Award, improving communications, changes in the TF/SIG portfolio, and providing support for URAN. The Programme was also obliged to change the way it functioned in response to COVID-19. This section summarises each of those developments.

5.1 Reporting

In order to improve the reporting process of the GÉANT Community Programme, new methods have been developed to support an easier reporting and overview of activities and impacts, namely, monthly TF and SIG coordination report, and bi-annual and annual TF and SIG dashboard. Each of these is described below.

5.1.1 Monthly Task Force and Special Interest Group Coordination Report

The coordinators of the Task Forces and Special Interest Groups now have a monthly reporting sheet which is also used for the quarterly, bi-annual and annual reports. The reporting sheet gives an overview of the past month’s activities of each TF/SIG, the number of participants, focus of the meetings, important topics/themes and the outcomes/impact of the meetings – a summary of what the meeting attendees took back to their organisation and how it has impacted their professional work. In addition, the report identifies planned future meetings, and potential synergies with other expert groups and activities. The reporting sheet template is shown in Figure 5.1 below.

Meeting dates Location(s) Number of participants (during the last month)	Focus of the meeting Important topics, themes Discussion topics	Outcomes / impact (This should be descriptive on the content and what the meeting attendees took back to their organisation and how it has impacted their work.)	Blog link(s)	Planned future meetings Dates, locations Topics, focus	Other event presence: Name of event: URL Dates / location Participant types Presentation / session / workshop	Other comments
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Figure 5.1: GÉANT Community Programme – monthly reporting sheet

5.1.2 Bi-annual and Annual Task Force and Special Interest Group Dashboard

Starting in September 2021, the GÉANT Community Programme has aimed to provide a structured impact assessment of its activities by reporting in a dashboard format on each TF/SIG's penetration, retention of members, knowledge base and reusable results, level of activity, and impact. This dashboard also helps the GÉANT Community Committee to review the TFs/SIGs on an annual basis, understanding their lifecycle and identifying potential trends and challenges. The dashboard template is shown in Table 5.1 below.

Metric	Measure	Justification	Method of calculation	Timing	Responsible	Notes	Evidence actions
1	Penetration	Engagement by NRENs when there is potential interest/relevance shows the value of the GCP	Unique number of organisations represented in a rolling 12-month period out of a potential pool of interest	Bi-annually	GCP Coordinator	Binary count of unique organisations represented in a country. NB outside of Europe shown on a continent basis 1st reporting period: June to December (February/March GCC meeting) 2nd reporting period: June (previous year) to end of May (actual year) – (June GA)	Awareness, identify trends, manage lifecycle, support gaps
2	Retention	The effectiveness of the GCP can be measured by the ongoing participation of unique organisations	Recording on a rolling 12-month basis the attendance/non-attendance in all the meetings in that period for the GCP meetings of relevance and then taking an overall average. Note this metric may also be considered over the whole life period (Term of reference stated) for a SIG when	Bi-annually	GCP Coordinator	Using the methodology of metric 1 to identify relevance 1st reporting period: June to December (February/March GCC meeting) 2nd reporting period: June (previous year) to	Lifecycle

Metric	Measure	Justification	Method of calculation	Timing	Responsible	Notes	Evidence actions
			considering renewal of that SIG			end of May (actual year) – (June GA)	
3	Knowledge base and reusable results	Objectively quantifiable output that can be reused after the specific meeting – persistence of effect	Quantifiable output recorded per meeting (blog post/wiki/presentation/other). Recorded by TF/SIG coordinator. Measured as a percentage on a rolling 12 month against the number of meetings and if an output was made	Monthly	TF/SIG coordinators	Use of a checklist to support coordinators to remind them of the reporting requirement in the conduct of the GCP meetings *Possible pre-meeting checklist and post meeting checklist* Comment from chair’s coordinators	Knowledge base
4	Active	Action through whatever medium (meetings/emails/etc.) is a positive indication of the value of that GCP stream	The coordinator/steering committee to signal annually on the status of the GCP stream	Bi-annually	TF/SIG coordinators	Measured as a binary red/amber/green with the ability to add a comment 1st reporting period: June to December (February/March GCC meeting) 2nd reporting period: June (previous year) to	Manage lifecycle

Metric	Measure	Justification	Method of calculation	Timing	Responsible	Notes	Evidence actions
						end of May (actual year) – (June GA)	
5	Impact	Value creation as a result of work done	The coordinator to record in each meeting the impacts from earlier work – perhaps as a standing agenda item. Recorded in free text to be used by the GCC Shows link from TF/SIG to project deliverable	Monthly	TF/SIG coordinators	Use of a checklist to support coordinators to remind them of the reporting requirement in the conduct of the GCP meetings *Possible pre-meeting checklist and post meeting checklist*	Connecting networks

Table 5.1: Bi-annual/annual dashboard for GÉANT Community Programme activities

5.2 Activity Mapping and Gap Identification

In late 2021, the GÉANT Community Committee worked on mapping the activities of the broader GÉANT community, which includes all GÉANT Association and GÉANT project activities, in relation to the GÉANT Community Programme activities and GÉANT Community Committee members. The Committee has designated one of its members to each activity based on thematic area, whereby members are responsible for having an overview of their respective area and providing feedback and recommendation to the Committee and to the TFs/SIGs as outlined in Section 3.3.

5.3 One-off Workshops

A new activity in this period was the introduction of a flexible set of “one-off” workshops to address areas of interest, specific themes and issues arising from the broader R&E remit that are either not covered by more traditional Task Forces and Special Interest Groups or to focus on these areas in more detail. The GCP has created a support structure to stimulate and coordinate the evolution of those topics. The workshops are discussed in more detail in Section 6.11.

5.4 GÉANT Innovation Programme

As part of the GÉANT Community Programme and an increased focus on stimulating innovation, the GÉANT Association reserved EUR300k to support an Innovation Programme for specific research projects to be carried out by the GÉANT community, i.e. GÉANT Member NRENs, universities, research institutions or other such legal entities to which a GÉANT Association Member NREN provides services.

The call for proposals is for research project funding of up to EUR30k, for a maximum duration of 5–6 months with possible extensions up to 9 months. This initiative started in 2021 and had 10 projects successfully completed in the first year; at the time of writing, the final results of the 10 projects undertaken in 2022 are awaited. The GÉANT Innovation Programme is discussed in more detail in Section 7.

5.5 Improved Process and Profile of GÉANT Community Award

Starting at the end of 2021, the GÉANT Community Programme took ownership of the GÉANT Community Award and developed a new, more engaging, rewarding and transparent way to bring together the broader research and education community to recognise the contributions from its members. As part of this approach, a new webpage has been created showing a clear timeline, the nomination criteria, selection process and Award Committee, and an online form for submitting nominations [[GCA](#)]. In addition, the new process includes sharing the shortlist of nominees (it is displayed on the website) and enabling community members to vote for the shortlisted candidates. A more than 50% increase in the previous number of nominations were received for 2022, and considerable support was demonstrated by those voting on the shortlisted nominees. The new process was very well received both by the nominees and by the general community members. The GÉANT Community Award is discussed in more detail in Section 8.

5.6 Communicating the Value of the Programme

GÉANT added more support to increase the visibility, engagement, transparency and understanding of the GÉANT Community Programme activities. The overall look and feel of the GÉANT Community

Programme were rethought as part of the creation of a dedicated Community website [[GC website](#)], [[GCP website](#)]. The marketing and communications team also created an animation video to explain the concept behind the Community Programme and its activities [[GCP video](#)]. In addition, video and text “impact interviews” with the Chairs and Steering Committee members of various Task Forces and Special Interest Groups, and with GCC members, have been produced; these are described in more detail in Section 6.13.

An Infoshare programme for the GÉANT community was launched in November 2020 and using this mechanism to raise the profile of the programme across the community several infoshares were held for the research and education community about the GCP and its activities and thematic areas, combined with social media and online articles and accompanied by slidesets. A full list is available at [[GC Infoshares](#)].

5.7 TF/SIG Portfolio changes

As a result of the TF/SIG lifecycle process, the following TFs/SIGs were established, closed or transitioned to self-sustainability during the GN4-3 project:

- Established:
 - Task Force on Educational Activities and Services (TF-EDU) [[TF-EDU](#)].
It was noted that, to complement the existing strong focus on the *research* element of R&E, the community wanted to share knowledge and collaborate in the area of *education*.
 - Task Force on eHealth (TF-eHealth) [[TF-eHealth](#)].
Established in response to the continued and additional focus on eHealth, and to reflect and support the EU’s Sustainable Development Goal with regard to health.
- Closed:
 - Task Force on Data Protection Regulation (TF-DPR).
TF-DPR was always intended to be of limited duration, its focus being to share best practice on implementing GDPR in the R&E community.
 - Special Interest Group on Performance Monitoring and Verification (SIG-PMV).
It was decided that this topic did not require its own SIG but could be covered in the SIG-NGN, with a number of supplementary infoshares to ensure NRENS are kept up to date.
 - Special Interest Group on Transnational Education (SIG-TNE).
Superseded by TF-EDU.
- Transitioned:
 - Task Force on Computer Security Incident Response Teams (TF-CSIRT) [[TF-CSIRT](#)].
It was decided that this large TF would be better served by a different governance model.

5.8 Support for URAN

Following Russia's invasion of Ukraine in early 2022, the GÉANT community stepped up to support its Ukrainian colleagues, both by rapidly addressing immediate needs (such as by helping to provide storage for data and sending equipment) and by creating a structural support group, "Community Action Aid — URAN", under the collaborative activity framework of the Community Programme. The group brings together the expertise and resources of the GÉANT community to provide various forms of practical support to NRENs that, due to external circumstances, find themselves in extremely critical situations, the severity of the circumstances presenting serious risks to life, affecting both the people and the capacity of the networks to support the national education, scientific and research community.

5.9 Changes in Response to COVID-19

When the COVID-19 pandemic started in February 2020, the GCP had to quickly adapt and convert planned face-to-face community meetings and workshops to online only, as well as address urgent needs from community members. Meetings tended to be more frequent, shorter, and more focused. Virtual collaboration tools became the central hub for community activities, including (beyond the thematic area meetings) a Zoom "GÉANT Community Café", an open online space for providing additional community support and engagement during lockdown, for exchanging thoughts, concerns and ideas and getting feedback from each other. Three virtual community meetings were held specifically addressing the situation around COVID-19 in the first quarter of 2020. Some of the discussions led to various TFs and SIGs featuring those topics on their meeting agendas; for example, sharing NREN strategies for rapid conversion from onsite education to online education, moving to the cloud, scaling-up and scaling-down strategies, as well as communications strategies and approaches (TF-EDU, SIG-Marcomms, SIG-NOC) and the creation of a specific crisis management and communication exercise (CLAW). Other topics, such as Distributed Ledger Technologies (DLT) and eHealth, were new.

Several infoshare events were organised to support the knowledge-sharing and promotional activities of the GÉANT Community Programme.

The GÉANT Community Programme also collected best practices and resources to support the members during the challenging times and shared them on a dedicated wiki page [[C-19 Resources](#)].

More details can be found in the CONNECT Online post [[C-19 Together](#)].

Having remote meetings and workshops benefited GÉANT community members as more people from more countries were able to attend and participate on an equal basis, supporting inclusivity for all. However, virtual meetings required more preparation and extended support from the Community Programme team to run them smoothly and to ensure that all remote participants were engaged and their voices were heard. The GÉANT community stepped up to support societies during this crisis using its knowledge and tools in the areas of education and communication, and especially in coordinating global knowledge and joint actions. Several SIGs and TFs addressed the new challenges being faced in research and education.

6 Thematic Area Support

This section presents a summary of the activities that have taken place in GN4-3 to support each thematic area. It also includes one-off workshops and collaborative activities, and an assessment of the activities’ impact and reach.

6.1 Overview

During the four-year period of GN4-3, attendance at GÉANT Community Programme meetings and events continuously increased (Figure 6.1). In the first year of the project, 2019, the previous record for annual attendance was surpassed, with a total of 1,923 attendees at 36 meetings of Task Forces, Special Interest Groups, one-off workshops and infoshares. In the last year of the project, 2022, the record was broken again, with 2,043 attendees from 77 different countries at 35 events. In total, there were 7,283 participants and 123 events.

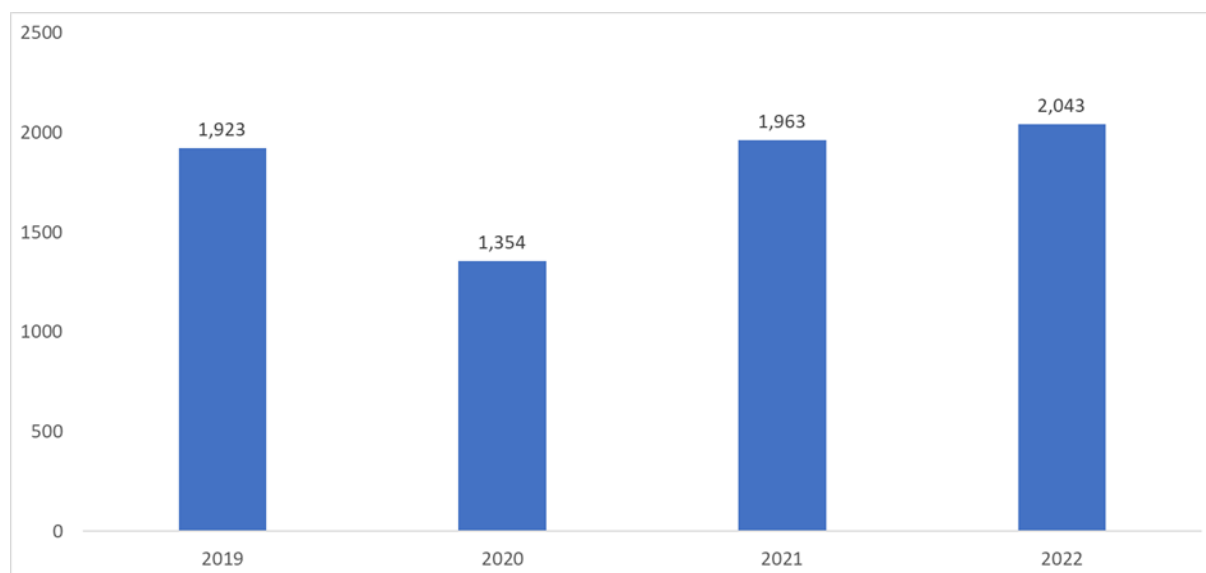


Figure 6.1: GÉANT Community Programme meeting attendance overview

In **Period 1** (1 January 2019 – 30 April 2020), **30 Task Force and Special Interest Group meetings** were held along with **6 “one-off” workshops**. A total of **1,923 members of the GÉANT community attended these events** and benefited from knowledge sharing across a very broad section of topics areas – including a new Task Force with a focus on Education.

In **Period 2** (1 May 2020 – 31 August 2021), **34 Task Force and Special Interest Group meetings** were held (TF-CSIRT: 3, SIG-MSP: 4, SIG-NOC: 3, TF-EDU: 11, SIG-Multimedia: 1, TF-RED: 3, SIG-ISM: 2, SIG-Marcomms: 4, TF-eHealth: 1, GCP infoshare 1, Security day 1), totalling 237 participants. GÉANT Community programme events recorded high numbers of attendees, including many more global participants, during the COVID-19 pandemic.

In **Period 3** (1 September 2021 to 31 December 2022), 42 meetings took place in total: **36 Task Force and Special Interest Group meetings** were held (TF-CSIRT: 3; SIG-MSP: 3; SIG-Marcomms: 4; TF-EDU: 2; SIG-ISM: 2; SIG-NGN: 5; TF-DLT: 5; SIG-NOC: 3; SIG-CISS: 4; SIG-Multimedia: 2; TF-eHealth: 2; TF-RED: 1) and **6 “one-off” workshops and collaborative activities meetings** (Public Affairs: 2; GÉANT Innovation Programme showcase: 1; REFEDS: 1; Security Day: 1; NPAPW: 1), totalling 2,368 participants. This period recorded the highest number of meetings and attendees.

6.2 Security

6.2.1 Task Force on Computer Security Incident Response Teams (TF-CSIRT)

Period 1

TF-CSIRT meets three times a year in May, September, and January. From January 2019 to April 2020 three face-to-face meetings were held in Tallin, Luxembourg, and Cyprus. The January meeting was again a joint collaboration with the FIRST community [[FIRST](#)]. The face-to-face meeting due to take place in Romania for May 2020 had to be cancelled due to the COVID crisis and a series of short VCs were planned instead. The COVID-19 crisis also impacted the operation of the TRANSITS training courses, and the course planned for April 2020 had to be postponed. The TF-CSIRT team explored options for TRANSITS training and the planned TF-CSIRT meeting for the autumn of 2020. The TF-CSIRT community continued to grow, with a total of 395 listed teams within Trusted Introducer (TI), of which 216 were accredited and 31 were certified.

As well as sharing information on practical topics such as malware analysis, APIs for security work and forensic lab work, meetings included presentations and discussions on EU incident response capabilities, CSIRT maturity and CSIRT training networks. TF-CSIRT also reflected on its strategy, which at the time had been in place for two years [[TF-CSIRT Strategy](#)]. TRANSITS training materials form a key part of the TF-CSIRT portfolio and were being made available under a Creative Commons licence. The first set of these materials was available on the TF-CSIRT website [[TF-CSIRT TRANSITS Mats](#)] and other modules were due to be made available in the near future. TRANSITS provides affordable, high-quality training to both new and experienced CSIRT personnel, as well as individuals with a bona-fide interest in establishing a CSIRT.

Key outputs of this TF during the period include:

- The TF-CSIRT Futures Working Group published an RFQ to look at a future legal structure for TF-CSIRT.
- The first of the new TRANSITS materials was published under Creative Commons on the TF-CSIRT website.

Period 2

The following TF-CSIRT meetings were held during Period 2:

- In the first quarter of P2, four virtual meetings were hosted: a Steering Committee (SC), a Futures Working Group, a Taxonomy Working Group and a Community Update Report. A new secure chat service for the community was launched.

- TF-CSIRT hosted its 61st virtual meeting and celebrated its 20th anniversary. The event, which attracted 170 participants, took place online on 30 September – 1 October 2020 and included three side meetings for the Steering Committee, Futures WG and Taxonomy WG.

An election was due to be held for three Steering Committee positions. The Trusted Introducer team was working with the Zeus tool for trusted voting, which had been integrated with the TI certificate authentication workflow. This was judged to be a good outcome for both the TF-CSIRT Community and the NREs developing the tools.

The focus of the meeting was on trust – what does trust mean in the community, how can the trust infrastructure be expanded to incorporate new challenges (online voting), and how can new members be trusted especially in light of US embargos. Several topics of interest were discussed including the voting process at the September 2020 meeting, the meeting plans for January 2021, and the new cost model for Pastebin (a website where any text, including pieces of source code or configuration information, can be stored online for easy sharing [[Pastebin](#)]) and whether they can be approached about it. Future work was due to cover a review of the accreditation criteria and of the terms of reference to update the approach to voting.

Several blog posts were created for the meeting [[TF-CSIRT News](#)]. These included six interviews with community members, and posts on the video created for the meeting, on new SC candidates and soliciting feedback on the election process.

- A TF-CSIRT meeting took place on 25–26 January 2021, with 230 participants. Activities and results included the creation of new TF-CSIRT working groups on accreditation and voting, and a successful Capture the Flag exercise. The TF also looked at the impact of the NIS2 Directive on CSIRTs. The KPI of 80% participation in the response testing was achieved. The key topics discussed included: remote forensics, AI and security, OpenVAS vulnerabilities and big game hunting. Topic proposals for the next meeting included: COVID-19 related attacks / impact on network / incidents; community updates; HPC incidents; communication techniques with non-technical management; malware analysis (Cuckoo toolbox); general focus on tools; incident response in controlled / restricted environments; learning from (the) pandemic; and incident response from home.
- A virtual meeting was held with 88 participants on 27–28 May 2021. The key topics covered were network security and CSIRTs, and crisis management training in virtual environments. The new voting process, some changes to the ToR, and the TF-CSIRT futures proposal were also approved.

Period 3

The following activities took place in Period 3:

- A virtual meeting was held on 13–14 September 2021 with 180 participants. New Steering Committee members were appointed [[TF CSIRT SC](#)]. The following topics were discussed:
 - MISP (an open-source threat intelligence and sharing platform).

- Ryuk analysis and incident response. (Ryuk is targeted ransomware where demands are set according to the victim's perceived ability to pay [\[Ryuk\]](#).)
- Office365.
- Spoofing.
- NIS2.
- TLS1.3 deprecation.
- Phase 2 of the TF-CSIRT Futures project was kicked-off and the September 2021 reaction test completed.
- A TF-CSIRT Futures Partners meeting was held on 12 October 2021 in Amsterdam, during which good progress was made towards defining the TF's future structure.
- A TF-CSIRT Steering Committee meeting was also held on 28 October 2021. Monthly meetings of the SC were taking place to push forward the Futures work. A draft ToR for the new Foundation and statements from the Futures Partners on contributions were in place.
- The first live TRANSITS training since 2019 took place on 16–18 November 2021 with 21 participants. The smaller than usual number of attendees was due to having to limit participation in consideration of COVID-19 restrictions.
- A virtual meeting with 352 participants was organised in March 2022. The main topics discussed were:
 - New bylaws for OpenCSIRT Foundation drafted by notary.
 - TRANSITS return to face-to-face teaching.
 - March reaction test completed—several issues with spam blocking identified.
 - Joint meeting with FIRST.
 - Emergency meeting to discuss support for Ukraine and issues with Russian and Belarussian teams led to RU and BY teams being suspended from Trusted Introducer.

Details of all TF-CSIRT meetings can be found at [\[TF-CSIRT-Meetings\]](#).

6.2.2 Special Interest Group on Information Security Management (SIG-ISM)

Period 1

In April 2019, SIG-ISM reunited with the WISE Community (Wise Information Security for Collaborating e-Infrastructures), to discuss risk assessment and management, security baselining, training and awareness, crisis management and information exchange. The two security collaborations were established back in 2015 and held their first joint meeting in Barcelona. Four years on, it was agreed to strengthen their relations and collaborate more closely by forming a joint working group on Security Communications Challenge Coordination. They will also continue to work together on an Inventory for Security Officers and hold joint meetings at least once a year.

The second meeting took place on 21–22 October 2019 in Zagreb. CARNET (the Croatian NREN) had only recently started attending the SIG-ISM meetings. The group had not met since April that year and had several updates to share, from general information about risk management and information security governance, to incident and risk mitigation stories. The meeting included community presentations and three feedback sessions: on the annual Cyber Threat Assessment conducted by

SURFnet; on the structure of the Security Baseline for NRENs, which is being developed as part of the Security Work Package in the GN4-3 project (WP8); and on the work that the Business Continuity Planning team is doing within the project.

Period 2

- A two-day joint SIG-ISM and WISE meeting took place on 26 and 29 October 2020, with 38 participants. Discussions focused on the work done and on planning future collaboration between the two groups. Joint sessions looked at the progress of the groups in the past few years, shared results and outcomes and presented challenges to be overcome. The most up-to-date information on Information Security Management was shared, including Security for Collaborating Infrastructures (SCI), security policy and SLATE (Services Layer at the Edge). The programme also featured updates about the GÉANT Security Strategy, discussion on Vulnerability Assessment as a Service (VAaaS), security baseline, business continuity recommendations and discussions on the EU-US privacy shield. Participants also shared concerns about the protection of sensitive data, talked about ISO certification, Cyber Security Month and shared their COVID-19-related challenges. The WISE session featured a proposal for a new working group dedicated to “Best practices on handling software vulnerabilities”. Two blog posts were created for the events [[SIG-ISM/WISE 1](#)], [[SIG-ISM/WISE 2](#)].
- A SIG-ISM Steering Committee meeting was held on 7 April 2021 to prepare for the next SIG-ISM meeting and Security Day.
- A joint SIG-ISM / WISE meeting was held on 25 May 2021 with 40 participants. The meeting featured updates from all WISE working groups and on international security communities and projects, as well as presentations on current and upcoming security subjects. Topics covered included: Cyber Security Month 2021; regional Security Operations Centres (SOCs) development; emergency cyber surveillance threats; new EU and UK Legislation on cybersecurity; next phase of the GÉANT project; EOOSC – trust and security; and fighting online distribution of child sexual abuse material.
- Security Day 2021 took place online on 14 June 2021. Around 85 attendees joined a full day of discussions, workshops and briefings on the latest security developments for research and education. The main objective of the one-day event was to share progress and achievements, look at new ways for the GÉANT community to collaborate in the future, and resource-sharing. [[SecurityDay 2021](#)].

Period 3

- A virtual meeting took place on 26–27 October 2021 with 48 registered participants – 24 per session. The following topics were discussed:
 - Follow up / updates on EU directives – upcoming Regulations for security in the EU.
 - Security roadmap for GÉANT.
 - Crisis management / business continuity –2020 experiences/outcomes.
 - Security baseline.
 - Security operations – What does your security look like? How Security is set up in different organisations.
 - “Zero Trust” (guest speaker from BT).
 - “Tooling” from Support Security Operations.
 - Privacy vs. Security – how can these work together.

- Security policies / policy-making.
- SIG-ISM/WISE complementary projects.
- The challenges of handling security risk in EOSC and the EOSC security baseline.
- A virtual meeting took place in April 2022 with 50 participants. The following topics were discussed:
 - Top 10 risks for R&E.
 - COBIT 5 risk approach, ENISA Threat Landscape (October) 2021.
 - Top 10 threats for R&E.
 - Performance testing: How well is your NREN prepared for business continuity?
 - Looking ahead:
 - The European R&E security intelligence hub.
 - GN5-1 WP8.
 - Strategic Advisory Committee on Security.
 - WISE community introduction.
 - SCI Trust Framework – maturity assessment – how-to guidance.
 - Software Vulnerability Handling WG.
 - SCI-WG – maintenance of AARC PDK.
 - EOSC Security.
 - EOSC Security Incident Response.
 - Incident Response and Threat Intelligence WG.

6.3 Identity & Privacy

6.3.1 Task Force on Distributed Ledger Technologies (TF-DLT)

Period 3

- A virtual kick-off meeting was held on 27 October 2021. A total of 19 participants registered for the event, but additional members joined during the call so that 22 attended. At the meeting, the direction of work was outlined and initial views and topics were presented.
- Another virtual meeting took place on 14 December 2021, with 16 participants. Topics discussed included a welcome and follow-up to the kick-off meeting by CSC, and the Finnish IT Centre for Science’s proof of concept for using SSI to manage permissions for sensitive human genomic datasets. With regard to community initiatives, Belnet and the EBSI and user-centric model vs. the federation-centric model were discussed.
- The first meeting of 2022 took place virtually in February, with 21 participants. The following topics were covered:
 - Presentation reporting on EBSI (results, challenges, with Q&A).
 - Description of three proposed use cases.
- The second meeting of 2022 took place in April, with 15 participants. The topics addressed were:

- Dragonfly blockchain.
- “The Impact of European Digital Identity Wallets on NRENs” (presentation by a guest speaker from the GÉANT Innovation Programme).
- A virtual meeting was held in July with 12 attendees. During the meeting, the possible next steps for eduCLAIMS were discussed. An interest was expressed in investigating how it could bridge into the world of wallets, e.g. once a signed document has been created, how that could be digitally represented in a wallet. What is clear is that users do not know what to have signed, how to sign it, and what needs to be done to make it legal. What would be useful more broadly would be information to help users understand what needs to be done. There is a potential to take signatures forward in future GÉANT projects.
- A virtual meeting was held in September with 15 participants. The focus of the meeting was to discuss SSI implementation on the commercial side (in this case Microsoft) and to report on relevant initiatives in which GÉANT is involved, such as the EU Wallet pilots.

6.4 Education

6.4.1 Task Force on Educational Activities and Services (TF-EDU)

Period 1

The new Task Force on Educational Activities and Services (TF-EDU) was created in February 2020. Over 55 organisations, including NRENs, universities, education institutions and commercial companies specialising in educational technologies, have unanimously endorsed the creation of TF-EDU. This new Task Force aims to gather information, and discuss and develop tools and best practices to address the common issues faced by NRENs with regard to their educational services and activities. The Task Force’s areas of interest are varied and span Learning Management Systems (LMSs), Learning Analytics (LA), Virtual Learning Environments (VLEs), eduID, Open Educational Resources (OER) and more.

TF-EDU opens a space to enable organisations and individuals to share their own practice (both positive and less successful aspects). It is focused on two major tracks:

- Serving as a strategic platform for the creation of an overview of the educational technologies landscape in the NREN community and beyond.
- Liaising with interested parties and supporting the creation and work of smaller working groups that will dynamically form around specific services, challenges and opportunities in the area of educational technologies.

The Task Force held its first meeting in virtual format on 25 March 2020, at which the ways in which the NREN and R&E communities can meet the current challenges and support the continuation of education were addressed. The initiatives covered included the launch of openUp2U, a new next-generation digital learning environment platform, as well as several use cases from Norway, Croatia, Slovenia and the United Kingdom. Discussions followed on the topic of digital exams and digital assessment.

Period 2

- On 12 May 2020, the 3rd virtual TF-EDU meeting was held, dedicated to real-time collaboration tools, with around 70 attendees globally. The Steering Committee organised a 4th, longer virtual TF-EDU mini-conference jointly with representatives from SIG-Multimedia, TF-CSIRT, SIG-ISM, SIG-Marcomms and SIG-MSP to address some topics that are relevant for cross-expertise. The recording of the conference and all slides and information are available on the Task Force wiki [[TF-EDU Wiki](#)].
- Several discussions were held about the future situation after the pandemic.
- TF-EDU held four sessions on education at the virtual APAN conference (3–6 August 2020).
- The 5th TF-EDU meeting with 65 participants was held virtually on 29 October 2020, on the topic of digital transformation and scaling up quality.
- A learning analytics (LA) community session with 16 participants was held on 26 November 2020. Topics covered included: scaling-up of services, technical solutions, NPAPW and SIG-Multimedia collaboration. An update was provided on the NRENs' education strategy, real-time collaboration tools and digital assessment evolution since March 2020. A discussion was held on issues/challenges and opportunities involved in scaling up. Learning analytics experiences were also discussed, and CARNET shared dilemmas and challenges encountered by their learning analytics project, which aims to improve learning outcomes in Croatian schools by enhancing informed decision-making based on data evidence [[TF-EDU Nov2020](#)].
- On 8 December 2020, the 6th TF-EDU meeting took place with 38 attendees. The main focus of the meeting was data handling, with topics covered including data mining, educational analytics, learning analytics, opportunities and challenges for NRENs, eduID, and student mobility.
- A meeting on 7 January 2021 addressed the importance of standards in the EdTech ecosystem, with a focus on wrapping up 2020 and looking forward to 2021 TF-EDU plans and community needs. Topics and themes included: a presentation of the previous year's survey on educational services and activities, followed by SC members' perspective on educational services and challenges in their NRENs, plus a community discussion on scaling up LMS services; digital assessment challenges and the need for redesigning assessment strategies, rather than developing technological solutions for the old strategies (skills and competencies vs. knowledge reproduction assessment); and Schrems II challenges to developing educational services (Schrems II is a July 2020 judgment by the Court of Justice of the European Union which declared the European Commission's Privacy Shield Decision invalid on account of invasive US surveillance programmes, thereby making transfers of personal data on the basis of the Privacy Shield Decision illegal; the Court also stipulated stricter requirements for the transfer of personal data based on standard contract clauses [[Schrems II](#)]).
- The new annual survey on educational services and activities was launched during the infoshare (with deadline of 1 April 2021).
- On 4 March 2021, a virtual meeting was held with 40 participants. Topics included issues with Moodle and why it is crucial for NRENs to collaborate on developing customised solutions as well as the need for quickly scalable, low-cost, safe and secure LMS infrastructure. NRENs face specific needs for Moodle deployment ranging from central to local administration, migration of existing courses into a new solution or availability of specific plugins, to name just a few. The possibility of developing a common solution that would meet the specific needs of different NRENs, and at the same time benefit from collaborative development, administration

and future maintenance between NRENs, is a challenge the TF hoped to address in the next TF-EDU session.

- On 18 May 2021, a virtual community meeting with 29 participants was held to discuss topics including: stepping up and reaching out: EdTech startups; virtual classrooms; and reaching out to international students.
- On 17 June 2021, a virtual pre-TNC21 “mini-conference” took place, with 113 participants, focusing on both strategic opportunities and challenges, and sharing knowledge and best practice on practical issues related to the delivery of education, both nationally and globally. The event was hosted by TF-EDU Steering Committee members [[TF-EDU Mtg7](#)].

Period 3

- The 8th TF-EDU meeting was held virtually on 12 October 2021, with 52 registered participants. The meeting focused on TF-EDU strategic directions for 2022 and key takeaways since the pandemic on the effect of digitalisation of education, eduID, lifelong identities and student administration systems development – SURF pilots and international developments. The following strategic directions were presented and supported by the meeting attendees:
 - Strategic horizon scanning.
 - Knowledge management and sharing.
 - Community building.
 - Cross-sector collaboration.
 - Facilitating technological change:
 - Flexibilisation of education.
 - Data handling.

Regarding eduID and mobility, coordination of efforts on development is needed to ensure interoperability and standardisation for cross-border applications. Key takeaways included:

- NRENs to support connectivity.
- NRENs’ role to support trusted access to digital education tools and services.
- Open standards development.
- A hybrid face-to-face/virtual meeting was held in June during TNC22, with 40 attendees (20 in person and 20 remote). The results of the 2022 annual survey were shared and trends and challenges identified based on the survey results from the last four years. International projects where NRENs support education (CSC, Finland (Digivisio 2030) and SURF, the Netherlands) were discussed and experiences shared by the Swedish Council of Higher Education.

6.4.2 Special Interest Group – Transnational Education (SIG-TNE) *now closed*

Period 1

During the last year, the SIG developed a Toolkit document containing information on setting up and running a TNE support programme, and which includes country profiles where TNE activity is high,

example case studies, and links to various other useful resources. This document is aimed primarily at NRENs who wish to support their institutions in the delivery of TNE.

SIG-TNE established a workplan covering four key areas:

- TNE data – regional, national and global.
- Global TNE policies.
- Technology barriers and TNE service development.
- Tools, toolkits and resources.

Under the first workstream, the task conducted a survey, led by Jisc and Internet2, collecting, collating and analysing data related to TNE activities.

During TNC19, a SIG-TNE meeting was held during which an update was given to the members on the status of its activities.

Having started in February 2017, SIG-TNE closed in October 2020, superseded by TF-EDU (see Section 6.4.1 above).

6.5 Network Services and Technologies

6.5.1 Special Interest Group on Network Operations Centers (SIG-NOC)

Period 1

During the first meeting of the period, on 8–9 April 2019 in Ljubljana, Slovenia attendees learned about the challenges relating to NOC recruitment, were introduced to the MD-VPN Service Inventory tool and heard about lessons learned from CARNET’s cloud-managed school network project. A discussion was held on flow monitoring tools, focusing on their functionalities, strengths and weaknesses and a debate on “Tools for campus network as a service”. Campus Network as a Service (CNaaS) will be available for NRENs to offer to their connected institutions, standardising network architecture, tools and processes in use.

The Slovenian NOC introduced the WLAN-2020 project that is projecting Slovenia to impressive levels in the implementation of digital education. A SIG-NOC member from ARNES and a systems engineer from commercial partner Fortinet discussed their successful collaboration on WLAN-2020, presenting the project’s objectives, architecture, scalability and key features. Furthermore, ARNES introduced ARNES Automator, an application developed to help the ARNES NOC manage and operate the network, and RIPE NCC Routing Information System (RIS), which collects and makes publicly available Internet routing data from all over the world.

A two-day event was also held in Prague in November 2019, with 36 attendees (in person and remote) taking part in presentations, discussions and debates about a variety of current topics for NOCs.

Period 2

- The 12th SIG-NOC meeting on 23 June 2020 discussed the demand for new tools and services in light of the lessons learned from the COVID-19 situation as well as including a session entitled “How do the NOCs deal with security, bandwidth, quality assurance; demand for digital exams, helpdesks, e-signatures”. The meeting focused on the new normality after the COVID-19 lockdown, discussing tools and processes in the new situation and the debugging of incidents at the Network Operations Centres.
- The 13th SIG-NOC meeting was held on 26 January 2021, with 55 participants. Discussions included: the trials and tribulations of DIY development; Atlassian going to the cloud (Atlassian’s products include Jira (issue tracking), Confluence (content collaboration) and Trello (project management) [[Atlassian](#)]); sharing network telemetry data between NRENs and R&E organisations; NOC operations – what will be the new normal post-COVID-19; and latency and jitter monitoring for real-time applications: state of the art and real cases (LoLa) [[SIG-NOC Mtg13](#)].
- The 14th SIG-NOC meeting took place on 10 June 2021, with a key focus on “Managing the Network and Services of the Future”. Cyber Security Month 2021 was also introduced at the meeting [[SIG-NOC Mtg14](#)].

Period 3

- A virtual meeting was organised on 15 December 2021 with 45 participants. The theme of the meeting was “Operational challenges in the new normal”. An update was given on the progress made to date in GN4-3N (the four-year project to restructure and refresh the GÉANT backbone network [[GN4-3N](#)]), including deployment status, migration status and decommissioning status, along with a look at the top risks, financial status and what is planned for the next three months. The GN4-3N extended scope, which has been possible based on procurement savings to date compared to the budget estimates for the original reference network, was also discussed.
- A face-to-face meeting was held in May 2022 in Cambridge with 36 attendees. The meeting mainly focused on automation and orchestration. Of specific interest was a presentation about the SURF orchestrator, with use cases demonstrating how to use it, where to get it, and how to install it and integrate it into existing systems. This was followed by a presentation from RIPE NCC on the large-scale information service RIPEstat and its open data platform. The CEO of the network automation company NetYCE [[NetYCE](#)] gave a presentation on “How to drive standardisation and compliance with network automation”. Other presentations covered streaming telemetry (Jisc), “Microdep – End-to-end monitoring improves the quality of inter-domain routing” (Sikt), and the GÉANT “Network Automation eAcademy” (CSUC/RedIRIS). Various updates were given by SUNET and DFN.
- A hybrid meeting was held in November in Paris, with 70 attendees in total. The focus of the meeting was on sustainability with regard to network operations, how to best perform on energy optimisation of the network infrastructure and how to reduce power consumption. The first presentation, from GÉANT, shared best practices and experiences on optimising energy consumption for the network and the services offered on top of it. It was followed by a presentation from PSNC on energy optimisation and green solutions in the computing and networking areas at PSNC, including implementations and work that PSNC is doing for external parties. Flash talks on power consumption measurement practices (Belwü) and strategies for power shortages / blackouts (SWITCH) were also shared.

The second part of the meeting focused on networking technologies in the area of telemetry developments (RNP), P4-based flow monitoring system (University of Belgrade) and the routing solution Router for Academia, Research & Education (RARE) (RENATER). The day concluded with a presentation on efficient energy management for servers in data centres using a three-layer strategy (architecture, service and physical) in order to deal with energy restrictions at any level (rdlab Universitat Politècnica de Catalunya).

6.5.2 Special Interest Group on Next Generation Networks (SIG-NGN)

The Special Interest Group on Next Generation Networks (SIG-NGN) endeavours to create an open forum where experts from the community exchange information, knowledge, ideas and best practices about specific technical areas relevant to the research and education networking community. One area of focus of this SIG has been on using commodity (Whitebox) hardware to support a desegregated network infrastructure for both the IP and optical layers of the network.

Period 1

- During the SIG-NGN meeting of 1 October 2019 a number of topics were covered including “What’s happening in the NIAC”, which was followed by presentations on “AI Augmented Network Operations”. An overview was provided on “The Next Generation of GÉANT”. The following presentations were also given: “ARTEMIS: Neutralizing BGP Hijacking within a Minute”; “Next Generation Internet Projects”; “RARE Project Update”; “ESnet’s application of AI and ML to High Precision Telemetry”; and “Future Quantum Key Distribution Services on GÉANT”.
- At the meeting on 15–16 January 2020, challenges with time and frequency (T&F) services were discussed in detail. In the second part of the meeting a number of presentations were given, including: “SCION: New directions for high-throughput and high-security academic research communication”; “DCI for datalakes”; “Integrating Openstack with Tungsten”; “Kubernetes Networking”; “EISCAT-3D”; “LHCb Data Acquisition Network”; “GradientGraph”; and by ESnet on “ESnet6 High Touch Services: Real-Time Precision Telemetry and ML-based TCP Classification”.

Discussions were held on software becoming the new lock-in as the options for white box hardware shift the landscape to a wider range of vendors. Smartoptics showed how disaggregated optical systems are bringing disruption to the optical side of the network in the same way that white boxing is changing the landscape for the IP layer. GÉANT lab automation and network evolution will be validated as a disaggregated optical system is deployed and how an optical time frequency service providing improved precision can be deployed on this network will be investigated.

Period 3

- A new coordinator started supporting the SIG and two new Steering Committee members joined. The Steering Committee prepared the SIG’s kick-off meeting, which took place virtually on 13 December 2021 with 89 participants. This was a short meeting, taking place after almost two years of inactivity of this SIG, during which the NRENs shared practices and experiences on deployed transmission technologies faster than 100 Gbps, the variety of pluggable transceivers available from vendors for 400 Gbps, and where faster transmission technologies are evolving within the research community. Presentations were given by the optical networking solutions company Smartoptics [[Smartoptics](#)], ESnet, GÉANT, CESNET and SURF.

- A virtual meeting was held in February 2022 with 74 participants. The focus of the meeting was on network applications beyond the packet layer – with earthquake detection and quantum applications on the agenda.
- A virtual meeting was held in May 2022 with 71 participants. The focus of the meeting was to consider connectivity technology and services for environments and applications where optical networking is not possible or economically feasible. These include low Earth orbit (LEO) satellites, packet networking architectures for 5G, and other mobile technologies.
- A hybrid meeting was held in September 2022 in Reykjavik, Iceland, with 94 participants in total. The presentations and discussion focused on future network architectures that R&E networking will need in order to manage the next leap in capacity requirements from next-generation research infrastructures (HL-LHC, SKA, LSST and more). The meeting addressed technologies such as spectrum sharing (GÉANT, Funet, ESnet), underlay and overlay networking, L2 packet inspection, P4, and more, and discussed ideas for how these technologies can be used by R&E networks to perform traffic engineering, capacity management and provide support for demanding research applications. The latest developments on next-generation networks were shared by ORION, Florida International University, GARR, ESnet and SURF.
- A virtual meeting was held in November with 70 attendees. The meeting focused on programmable network technology. P4 and software data planes based on DPDK are the current popular solutions, as well as MPLS/IPv6 segment routing as an alternative paradigm. Switching and routing control plane software, to build complete solutions, is also emerging. Experiences with P4 and “FPGA / P4 / Controlplane – vision and reality” were shared by RENATER, AMD, ESnet and RARE, among others. To conclude the meeting, participants heard from VMWARE about the latest P4 standards updates and technological development for OFP4 – a P4 and OvS mashup.

6.5.3 Special Interest Group on Performance Monitoring and Verification (SIG-PMV): *now closed*

Period 1

During the 6th SIG-PMV meeting on 2–3 July 2019 in Dublin the group discussed the charter, goals, and review of scenarios and tools for SIG-PMV. The participants then heard an overview on “What’s New in OpenNMS 2019”. The topics of BGP monitoring, perfSONAR 4.2, the Service Analysis and Network Diagnostic (SAND) Project, and ESnet’s Experience (so far) with streaming network telemetry were then presented. The second day of the meeting included presentations about WiFiMon, Kubernetes and microservice monitoring. The final part was dedicated to eduPERT, its history and future. Following the discussion, it was felt that SIG-PMV should be closed, and its future content distributed between SIG-NOC and SIG-NGN. This was formally confirmed by the Steering Committee later in the year.

6.6 Media Services

6.6.1 Special Interest Group on Multimedia Applications (SIG-Multimedia)

Period 1

The last face-to-face meeting of SIG-Multimedia prior to the COVID-19 lockdown was held on 9 October 2019. Topics discussed included how NRENs provide services. The following presentations were given: a Jitsi-pilot update from SURFnet; a WebRTC Standardisation and STUN/TURN infrastructure update; a live demo of a multiparty meeting application in Docker with a final presentation about VoIP; and a presentation by the Hungarian NREN as a telco operator for a closed group. A discussion on the use of multimedia to bind the arts, education and video communities together ensued.

During the COVID-19 pandemic the group has seen a significant rise in interest from NRENs in sharing information on tools available, procurement and further joint developments. This topic is also being covered in TF-EDU.

Period 2

During Period 2 SIG-Multimedia was engaged in the deployment of eduMEET and interaction with TF-EDU.

Period 3

- A new coordinator started supporting the SIG and a new Steering Committee member joined.
- A virtual meeting was held in February 2022 with 40 participants. This was a kick-off meeting following two years of the group being dormant due to COVID-19, and focused on information sharing on multimedia best practices.
- A virtual meeting was held in May 2022 with 34 participants. The meeting addressed the topics of interactive video and virtual/augmented reality solutions for the future of research and education. Presentations were given by both open-source and commercial technology providers on their experiences with integration and future developments and how these comply with the open standards for education. The experiences of various NRENs using or exploring these technologies were also presented.

6.7 Cloud Services

6.7.1 Special Interest Group on Cloudy Interoperable Software Stacks (SIG-CISS)

Period 1

- The first SIG-CISS meeting of GN4-3 took place on 28–29 May 2019 at CERN in Geneva. All organisations present updated the community on their current affairs and projects in their home organisations as well as (pan-)European collaborations. One of the highlights was the

new CS3MESH4EOSC project [\[CS3MESH4EOSC\]](#) for which the proposal was drawn up in collaboration between the SIG-CISS and Cloud Storage Services for Synchronization and Sharing [\[CS3\]](#) communities. Other topics discussed included long-term storage at SWITCH, large data migrations at CESNET and the GARR Cloud. CSC presented on admin and development tooling for the CSC OpenStack Cloud and CERN updated the participants on the work done on CS3 APIs following the last CS3 Conference in Rome in January 2019.

- On 28–29 November 2019, the second meeting in the period was held at GRNET in Athens, during which the following topics were discussed: Architecture and design principles of the Oracle Cloud Infrastructure; Building a Public Cloud from scratch: Get to 8K cores OpenStack; GN4-3 community clouds update; Rahti – our OpenShift/OKD service. What have we learned?; The Armenian experience on clouds and a brief overview on Eastern Partnership Region cloud activities; “Cloud as a code”: half a year experience in production; Update on CS3MESH4EOSC status and progress; and a workshop on eduTEAMS for CS3MESH4EOSC followed by an eduTEAMS introduction.

Period 2

During Period 2 the CISS community was very active on a dedicated cloud operators Slack channel, initiated by SWITCH. Bi-weekly catch ups took place, but no official SIG-CISS meetings.

Period 3

- A new coordinator started supporting the SIG.
- A SIG-CISS Steering Committee meeting was held on 16 December 2021 after two years of inactivity. A new Steering Committee member also joined. Discussions centred around resuming the activities of the SIG, deciding how to meet, and what the focus of the SIG should be. It was suggested to resume simple, basic community building around the NRENs’ cloud activities and to avoid splitting the SIG into buyers and builders, working towards benefits for end users and NRENs. Other suggestions included themes for specific calls and the next SIG-CISS meeting (6th), that proposals from the Community Cloud position paper written by a number of NRENs should be followed, and the possibility of spawning a community PoC on Integrated Rule-Oriented Data System (iRODS) working on Persistent Identifiers for datasets and storage services and on contributing upstream to existing open-source projects.
- A virtual meeting took place in February 2022 with 35 participants. The NRENs’ position paper on the Community Cloud was the topic and feedback was sought for future GN projects.
- A face-to-face meeting took place in June during TNC22 with 30 participants. GARR and GRNET gave updates on ongoing and future cloud activities. Both NRENs underlined the need to keep up coordination on community clouds and the relevance of joint procurements. Vendor reports were presented (Dell, Huawei) on their latest storage hardware and cloud platforms. The SIG agreed that more focus should be given to storage platforms going forward.
- A hybrid meeting was held in September in Reykjavik, Iceland, with 28 attendees. The meeting focused on iRODS, OpenStack, and community cloud activities. Participants were updated on what NRENs are doing with OpenStack (CSC, CERN, KIFÜ, SURF, GARR) and agreed next steps around the Community Cloud Task. An overview of iRODS storage was given (SURF) and hands-on experience with iRODS was shared (SANGER).
- A virtual meeting was held in November with 22 participants. The first session focused on solutions and technology sharing from the community, with an overview of OpenInfra (OpenInfra), SURFCumulus (SURF), Liqo (POLITO) and SSH with Federated Identities using

OpenID Connect (KIT). It was followed by a series of reports from NRENs on building clouds (PSNC, GRENA and CESNET).

6.8 Organisational Services

6.8.1 Special Interest Group Management of Service Portfolios (SIG-MSP)

Period 1

The period saw strong activity by the group with three meetings held (two in person and one virtual).

- At the first meeting of the period on 5 March 2019 in Cyprus, the group stressed the importance of data transfer in the context of the European Open Science Cloud and more widely in the Open Science policy national initiatives. DeIC announced plans to launch Satcom services for researchers in remote areas, as well as the launch of an open call for collaboration to investigate the use of satellite communications to support researchers around the globe.
- During the second meeting, co-located with TF-Marcomms on 18 September 2019 in Montpellier, France, the group discussed services marketing as part of a wider strategic plan. The session objective was to improve collaboration between services managers and marcomms teams to ensure a good fit between needs and outputs, align team strategic planning and support company strategy.
- During the next meeting, held on 10 March 2020 in Istanbul, Turkey, a discussion was held around developing a services portfolio and serving the community in individual countries. This was followed by a discussion focused on the best practices around education and research and how the governance and members play a role in services development. Open discussions were held around business models and resources needed to run the service. An update was given on the work being carried out in the Security Work Package (WP8), followed by a session on future service portfolio development focused on security. The final part of the meeting was dedicated to the topic of EOSC, and discussions on “new” services which could be delivered by NRENs which go beyond “business as usual” (data transfer, etc.) and NREN involvement in data curation, FAIR certification, data management plans, support for virtual organisations, e-science application,; and e-science/EOSC-related topics.

Period 2

- A virtual meeting was held on 3 June 2020 on “Lessons learned and strategies used during the COVID-19 crisis for Service Portfolio Management”, with a special focus on VC tools.
- The second virtual meeting of the group took place on 29 September 2020, with 38 participants. Key topics covered included: an update on OCRE Cloud Services procurement; sharing national procurement experiences and “Procurement as a Service”; services to support national Open Science agendas; and Digital Innovation Hubs. A blog post on the meeting was published [[SIG-MSP Sep2020](#)].
- In November 2020, a “pop-up” MSP meeting of over 50 community members from Europe and the US on the topic of Atlassian was held following concerns from the community that changes in the overall Atlassian portfolio could negatively impact the community. Following the meeting, a strategy going forward was drawn up.

- A meeting took place on 19 January 2021 with 43 participants. Key topics were “T&I and Security services – ‘What’s new?’” and COVID-19 funding [[SIG-MSP_Jan2021](#)].
- On 13 April 2021, a mini-workshop was held on the subjects: Compendium; How NRENs can utilise COVID-19 relief funds; and eduTEAMS next steps [[SIG-MSP_Apr2021](#)].

Period 3

- On 21 September 2021, a virtual meeting was held with 41 participants. The following topics were discussed:
 - How external factors are impacting NRENs’ service portfolios.
 - NIS directive update.
 - Strategic plans update.

More information is provided in a blog post published in CONNECT online [[SIG-MSP_Sep21](#)].

- In March 2022, a joint virtual meeting was held with SIG-Marcomms, attended by 30 participants. The meeting focused on how NRENs are evolving and increasing their training activities and experiences of external training. From these discussions, it emerged that NRENs should share more information about training best practices and further use training as a marketing tool.
- A hybrid meeting was held in October in Tbilisi, Georgia, with 48 attendees. The first part of the meeting focused on Contextualising Foresight in R&E – what is it, why is it important and latest lessons learned. The first speaker from EDHEC Business School, Lille, introduced what strategic foresight is and how leading organisations leverage it to develop novel businesses. NREN national case studies followed, with presentations from Jisc and SURF who discussed why foresight is important for NRENs, exploiting the opportunities of new technologies to their fullest potential as well as plans and ideas for the future.

The second part of the meeting was on Sustainability of Services. GÉANT shared feedback and lessons learned from the CEO track and forum that took place at TNC22 in June, with an analysis of environment, organisational set-up, strategic plans and evolution of the service portfolio.

In the Above-the-net Services session, GÉANT talked about procurement as a service and welcomed a lively discussion with high involvement of EaP countries on international collaboration. SURFSpot and HEAnet Store explained how students in the Netherlands and Ireland can benefit from the purchase of hardware and software at favourable rates. Participants also received an update on the GÉANT Compendium and were introduced to the GÉANT Foresight study: work will start in 2024 under the auspices of the GN5-1 project. The meeting concluded with a presentation on RedIRIS’s strategic plans for 2024.

6.8.2 Special Interest Group on Marketing and Communications (SIG-Marcomms)

Period 1

- At its first meeting in the period, on 4–6 February 2019 in London, UK, the group approached the subject of crisis management and communications. Having originated the idea for the GÉANT community CLAW workshops, the group heard a report from the second CLAW event – held in November 2018 – where it was noted that clearly defining roles and responsibilities is an important step towards successfully dealing with a crisis. Belnet, SURF and Jisc

presentations then revealed their lessons learned from CLAW, practical exercises and, in some cases, real crises, and the plans put in place by each organisation. The common thread found was that substantial marcomms support and regular practice are needed to turn crisis management from a one-off stressful situation into a task that all those involved can easily handle.

- During TNC19 (16–20 June 2019, Tallinn, Estonia) a joint meeting of SIG-Marcomms was held with the Global PR Network. The groups explored challenges and opportunities in marketing communications work which supports the core business of research and education networks around the world. Participants shared their experiences and best practices and explored which TNC19 sessions and keynotes look promising for future marcomms work and collaborations.
- At the SIG-Marcomms meeting in Montpellier, France on 17–18 September 2019, which included an afternoon joint meeting with SIG-MSP, the following questions were explored: How can NRENs attract the right staff?; and How to build and manage a brand towards different target groups and especially towards potential job candidates?
- An extraordinary meeting with a COVID-19 focus was held virtually in Q4 to share best practices around marketing and communications. The outcome was a shared understanding of the key messages and some best practices for NRENs in this challenging time.

Period 2

- On 29–30 October 2020, an online meeting took place with around 50 attendees from Europe, Asia-Pacific, North America, Africa and the Arab States, with participants from the Partnership for Advanced Computing in Europe (PRACE). The main focus of the meeting was on how NRENs have been adapting to COVID-19, including success stories, events and tools to support engagement and internal communications. Participants expressed interest in a joint workshop (with e.g. TF-Multimedia, TF-EDU) focusing on engagement tools, best practices and similar for online events.
- A SIG-Marcomms online meeting, including a TF-RED joint session, was held on 29-30 March 2021 to discuss how research engagement and marcomms colleagues could support each other's work. Topics included: a brief introduction to SIG-Marcomms, what kind of information marcomms teams need from research engagement colleagues; a brief introduction to TF-RED; stages of development, useful tools and channels, what "success" looks like, interview series; brief examples of synergies; and the example of the EaPConnect project.
- An online meeting was held on 29 June 2021 to discuss networking, regional project updates, NREN updates, and life after COVID-19. The meeting was wrapped up with a feedback survey.

Period 3

- A virtual meeting was held on 30 September – 1 October 2021 with 42 participants. The focus of the meeting was on:
 - Future of events (lessons learned in COVID times).
 - Brand strategy.
 - Multi-lingual website management.
 - Teaser session – testing the level of interest in a follow-up practical workshop on video production processes and skills.
 - Updates on:
 - WACREN website and newsletter.

- Clouds.
- Cyber Security Month.
- A virtual meeting took place in March 2022 attended by 48 participants over two days. On the first day, a joint meeting with SIG-MSP was held (described in Section 6.8.1 above), while communications topics were covered on the second day, including communications updates, Women in STEM campaigns, and practical examples on how to construct a searchable social media dashboard, including templates and practical guidelines.
- A face-to-face meeting was held during TNC22 (13–17 June 2022, Trieste, Italy) with around 42 attendees (25 in person and 17 remote). The meeting focused on the topics of website development and promotion, with presentations on messaging refresh, privacy and compliance for websites, and webpages for target audiences. The meeting included an engaging Q&A session in the afternoon and an open discussion on marcomms challenges; HR recruitment campaigns and website platforms were among the topics discussed.
- A hybrid meeting was held in October 2022 in Brussels, Belgium, with 44 attendees. The meeting focused on three main topics: social media campaigns, including a workshop led by GÉANT on how to create and use videos and visuals; the structure of various marcomms teams across the NRENs; and brand management, with a focus on rebranding and employer branding. PRACE presented their various communications channels and campaigns. Also on the topic of addressing the audience on social media and customising content for different targets to increase engagement, ARNES presented on how the Slovenian NREN uses different strategies for the general audience, users and institutions, and researchers. RENAM presented their view of “do’s” and “dont’s” in social media campaigns, and RENU shared a “behind the scenes” look at their social media campaigns and techniques. The discussion continued on how marcomms teams are structured (Belnet, RNP) and branding (RESTENA, Belnet, HEAnet, GRENA). Being such a wide topic, the presentations and the conversations included examples and questions about NREN brand management, HR recruitment campaigns and employer branding as well as the project branding.

6.9 Support Services

6.9.1 Task Force on Research Engagement Development (TF-RED)

TF-RED formalises existing collaborations of NRENs and other research infrastructures from around the world, to provide an open forum for all those interested, to work together and develop methods for engaging researchers and collaborations nationally and internationally. The scope of the Task Force focuses on collaboration between the participating NRENs/research infrastructures, who then work within their own countries to engage their research support offices and collaborations. The TF intends to develop a framework for research engagement amongst the participating NREN community, and with other research infrastructures. Its other ambition is to assist NRENs/research infrastructures to develop their own form of research engagement, which will benefit the various research domains across Europe (and beyond).

The vision of TF-RED is to grow NREN/research infrastructure business development capabilities and competencies for members through building a community of professionals which shares and

collaborates globally, thereby benefiting the global R&E community through the increased opportunities for collaboration offered to their researchers.

Period 1

- A TF-RED meeting took place at TNC19 (16–20 June 2019, Tallinn, Estonia) with the aim of scoping the varied nature of the international user organisations that make up its environment, including organisations of different sizes and forms, spanning multiple countries or individual campuses (multinational), or having operations within a number of countries at co-located sites but with one central headquarters (transnational). Given the wide range of AUPs, legislation and respective procedures involved, this workshop explored some of the service provision approaches that could be used.

GÉANT Association and the NREN partners work with these stakeholders to give participants the chance to better define how the GÉANT community could deliver services to international organisations. The meeting focused on user engagement successes from around the world, challenges and opportunities with engagement around cloud services and a workshop to better define the future direction of the Task Force.

- A virtual all-hands meeting was held on 24 March 2020, where the new chair, Chris Atherton of GÉANT, presented an update on the state of the Task Force and its progress since the last TF-RED meeting at TNC19 in Tallinn in June 2019.

Period 2

In Q1P2, the Task Force held a survey and began developing a Research Engagement Blueprint for the community. This document is aimed at NRENs who do not have a research engagement function, research liaison groups within a university or research institute, and also for an e-infrastructure involved in research or user engagement. It describes how to go about research engagement, which groups to talk to and the types of services for which help could be provided, as a starting point.

The Task Force also organised a virtual all-hands meeting and recorded a Q&A session with a long-standing community member who is due to retire at the end of the year, so that some of his thoughts and advice for future research engagement contributors could be captured. A logo and branding were developed for TF-RED, to improve its visibility and image.

Two meetings took place in Q2 of the period, in September and at the beginning of October 2020, where survey results were presented, and discussions held to further develop the Research Engagement Blueprint document, which was then presented at an all-hands meeting on 28 October 2020 with 26 attendees. The meeting included a presentation by SURF about the role of research engagement in facilitating the merger of the SURF families into one organisation. A video was produced of the presentation and the resulting Q&A session which is now stored on the wiki [[TF-RED Oct2020](#)]; the Research Engagement Blueprint is available at [[TF-RED REB](#)]. This body of material assists the NREN community in understanding the changes within the community, the effects on the NRENs involved and the impact they have on research engagement.

A meeting of the Global Research Engagement Group (GREG) was held on 22 October 2020 with a subset of members from TF-RED. GREG is a global NREN strategic collaboration to share knowledge and facilitate a coordinated and aligned effort in engaging with established and emerging Big Data research groups. The goal is to ensure that these groups are aware, and can maximise the value, of

the global research and education network community to enable a frictionless research experience throughout the research and data lifecycle.

A TF-RED joint session with SIG-Marcomms was held online on 29–30 March 2021, to discuss how research engagement and Marcomms colleagues could support each other's work (described in Section 6.8.2 above).

Two smaller meetings took place in Q4P2, the first on 14 June 2021 on the subject of data delivery infrastructure and the second on 29 June 2021, on the topics "Global (N)RENs Supporting Future Research" and "Artificial Intelligence".

A Research Data Alliance (RDA) Plenary was held with about 45 participants to discuss how NRENs can support the RDA community.

Period 3

- 27 September 2021 – Research Data Alliance (RDA): How NRENs can support the data lifecycle (online – 10 participants), discussing the objectives and vision for developing a data lifecycle and working group.
- 21 October 2021 – TF-RED All-Hands (online – 16 participants). Topics addressed included data movement challenges for NRENs, setting up a research engagement group, and setting up a national user forum. More information is given in a blog post published in CONNECT online [[TF-RED Oct2021](#)].
- 27 October 2021 – RDA: How NRENs can support the data lifecycle (online). During the meeting, a whiteboard exercise was held for developing a research data lifecycle model.
- A face-to-face meeting was held in June during TNC22 with 22 attendees (18 in person and 4 remote). HEAnet presented the research engagement activities taking place in Ireland; an open discussion followed about how some of these activities could translate to other regions around the world. The research engagement blueprint was presented. A strong desire was expressed to establish a training course for research engagement as it was widely agreed that commercial training courses do not meet the requirements of the GÉANT community.

6.10 Health Services

6.10.1 Task Force eHealth (TF-eHealth)

eHealth is an area of growing interest for the GÉANT and NREN community, given its increasingly central role in enhancing the quality of medical care. New user-centric services are being designed and provided, to ensure every citizen's right to health, for prevention, diagnosis and treatment of diseases. In the implementation of future eHealth, patients will be more and more in control of what information about their medical records will be made accessible, in turn being provided with highly personalised medical services responding to their specific health needs with greater effectiveness compared to common medical practice-based diagnostics and therapy. Genomics analysis, DNA sequencing, digital twins, AI, ML and robotics will change the landscape of eHealth and provide new instruments for doctors and specialists to work with.

Period 3

- The results of the successful eHealth baselining event held in January 2021 (see Section 6.11) were presented at the 23rd GÉANT Community Committee (GCC) meeting on 21 October 2021.
- A face-to-face meeting was held in June during TNC22 with 29 attendees. During the meeting, inspiring/lightning talks were presented on eHealth and discussions took place regarding the next steps to implement the TF work plan. The European Health Data Space regulation proposal (EHDS) and implications for NRENs and the Sovereign Data Cloud for eHealth in Europe were discussed.
- In July, a follow-up face-to-face meeting was organised in Malaga with 16 attendees, followed by Security and Privacy training for eHealth with 41 participants.

6.11 One-off Workshops

These workshops were very popular within the community and covered a variety of topics:

Period 1

- The **2019 edition of the Network Performing Arts Production Workshop (NPAPWS19)** was held on April 2–4 2019 at the Music and Dance Faculty of the Academy of Performing Arts in Prague (HAMU) [[HAMU](#)] in Prague, Czech Republic and included collaboration activities as well as a hackathon.
- A **Public Affairs Workshop** was also held to support NRENs in interacting more effectively with key stakeholders and distinguishing themselves from the other organisations when addressing policy makers.
- To support the new TF-EDU and the focus on “Education of the Community” programme, two one-off workshops took place, including an **education workshop and an NREN educational technologies workshop** at TNC19 to focus on the common interests in this area that emerged from the results of a Europe-wide survey and mapping exercise that was conducted in February and March 2019. Key topics were discussed in the areas of LMS lifecycle examples, microbadges, MyAcademicID and the Up2University Next Generation Digital Learning Environment. Together these workshops attracted 75+ attendees, reflecting a strong community interest. Over 50 participants from across the world with an interest in this topic took part in the inaugural TF-EDU.
- There was a continued focus on trust and identity and security, with a **Mobility Day and a workshop on “Security Operations Tools”**, both at TNC19. The latter initiative was held as part of the one-off workshop ideas and was aimed mainly at NREN security professionals. 23 people attended in person and 29 joined remotely. It took the form of an open meeting with a collaborative workshop and presentations for security operations practitioners. The following topics were covered: analytics, detection, automation for leveraging staff, and architecture and performance handling. The Mobility Day had a full agenda, to satisfy requirements from the mobility community that do not currently have a dedicated Task Force or Special Interest Group.

Period 2

- **e-Health:**
 - A very successful first workshop was held on 27 January 2021 with 104 participants. The objective of the workshop was to establish the community requirement for e-health technological activities coordination and synchronisation with research and community activities. This was a baseline session to hear from NRENs what their existing experience is and their (planned or potential) effort in the field of e-health.
 - On 25 June 2021, a meeting was held with 60 participants to establish the new Task Force on eHealth.
- **Managing and running a large-scale Moodle system, for IT:** Held on 20 April 2021 with 100 participants. The meeting objective was to share information, success stories, challenges and solutions from an IT perspective for running and managing a large-scale Moodle system
- **NPAPWS21:** 27–28 April 2021 was co-organised and co-hosted as an online event [[NPAPWS21](#)]. A record 150 participants attended from the US, EU, Asia/Pacific and Canada. The workshop focused on innovative technologies in the performing arts that utilise advanced networks provisioned by Internet2, GÉANT, and partners across the globe. The objective was to explore emerging solutions and lessons learned during 2020, including the transition to substantial reliance on home broadband connections.
- **Security Day:** 14 June 2021– Security Day was held online prior to TNC21 with 80 participants. Subjects covered ranged from DDoS, business continuity planning and security research to vulnerability assessment and related new technologies, as well as platforms and web applications scanning. The discussions and presentations touched also on the status of the Vulnerability Assessment as a Service project and API development plus general updates from GN4-3 Work Package 8 on security projects.
- **GCP infoshare:** 9 June 2021 – 51 participants. This infoshare provided an introduction and overview of the GÉANT Community Programme, including the thematic areas currently covered, examples of success stories originating from the Community Programme and Innovation Programme, and information on how to propose and create a topic to be included among the programme’s activities.

6.12 Collaborative Activities

6.12.1 REFEDS

Period 3

REFEDS’s annual meeting for Federation Operators and other interested parties was held virtually in June 2022 with 106 attendees. The meeting presented updates from the REFEDS work plan alongside presentations and themes for community members and a series of lightning talks highlighting progress from the community. Discussions were held on Federation 2.0 and Assurance Updates as well as on eduGAIN Futures.

6.12.2 Security Day

Period 3

A face-to-face meeting was held during TNC22 in June with 55 attendees. During this annual meeting, AI-based anomaly detection and QKD link monitoring were presented by ADVA representatives. Experiences from setting up a SOC at Sikt were shared by Uninett. An update was also provided on what is available from the security work package tooling options. This was followed by a WISE community meeting and working group meetings on communication challenges coordination, collaboration among infrastructures, and incident response and threat intelligence.

6.13 Impact

The value of the GÉANT Community Programme TF and SIG activities is described in a series of “impact interviews” with TF/SIG Chairs and Steering Committee members and GCC members. They were asked for their feedback, and to provide use cases, on the value they see for their organisation and their professional work in being engaged with the activities.

Interviews regarding the following activities took place during the period:

- Task Force on Distributed Ledger Technologies (TF-DLT) [[CONNECT TF-DLT](#)].
- Special Interest Group on Management of Service Portfolios (SIG-MSP) [[CONNECT SIG-MSP](#)].
- Special Interest Group on Network Operations Centres (SIG-NOC) [[CONNECT SIG-NOC](#)].
- Special Interest Group on Multimedia (SIG-Multimedia) [[CONNECT SIG-MM](#)].
- GCC, TF-EDU and SIG-Multimedia [scheduled for publication early 2023].
- Special Interest Group on Next Generation Networks (SIG-NGN) [scheduled for publication in January 2023].

The following NRENs / countries provided their input:

- Belnet, Belgium.
- DeiC, Denmark.
- ESnet, USA.
- NORDUnet, Nordics.
- PSNC, Poland.
- RedIRIS, Spain.
- SURF, The Netherlands.
- SWITCH, Switzerland.

All the interviews can be read at [[CONNECT IVIEWS](#)].

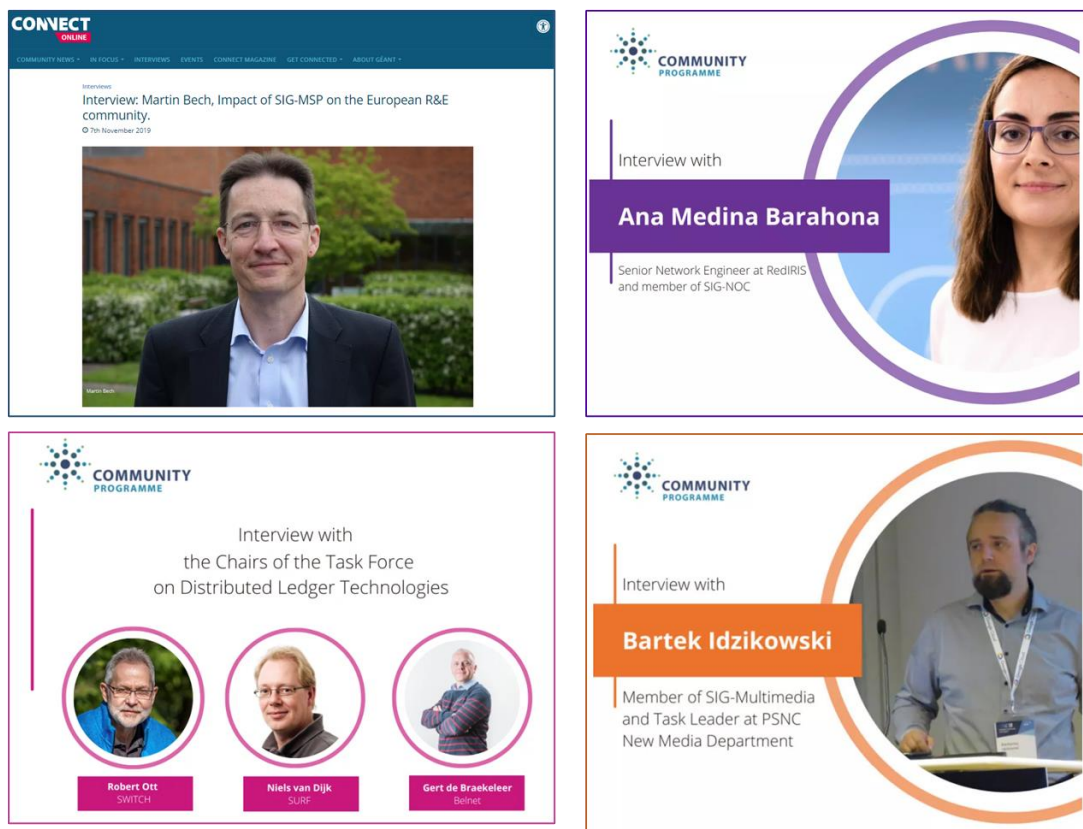


Figure 6.2: Selection of interviews with TF and SIG members

The interviews confirm that these groups present a valuable environment to share experiences, information, use cases and discoveries, to try out new ideas and to innovate. It is especially important in the international setting as local approaches in most cases should be based on best practices that have been established in a broader international context to ensure usability and interoperability beyond the national border. Working together with other experts in the same field, members can elaborate on ideas about where use cases are heading and, at early stages, help standardisation and cross-border, cross-industry synchronisation.

Specific examples provided by the interviews include:

TF-DLT

The work of TF-DLT has demonstrated that a large European organisation such as GÉANT can grasp the opportunity to bring the European Blockchain Services Infrastructure (EBSI) network of maintaining ledgers of information in a DLT by trustless blockchain nodes to the level of production in a European setting, where certain NRENs can focus on hosting, governance, use-case support, the trust model, strong identity authentication, security and privacy. In February 2020, Belnet, the Belgian NREN, was the first operator to launch an EBSI node and in 2021 this network proved its value for Belgium’s universities [[TF-DLT Belnet](#)]. Lack of resources and budget can force some NRENs to refrain or withdraw from such initiatives. So what is needed in this respect, and what GÉANT/TF-DLT offers, is a large European player capable of coordination, collaboration and commitment on the one hand and co-creation with (inter)national partners and the entire R&E community on the other.

SIG-MSP

SIG-MSP was the first group to instigate the mapping of participating NRENs' service portfolios, which is now known as the service matrix part of the GÉANT Compendium, a much-valued reference source charting European NRENs' development and the organisations behind them. It was also the first group to start discussions relating to rules of engagement for the provision of services between NRENs at an international level, work that is now continuing as part of the rules of engagement element for the EOSC programme service provision section. Further examples of the value of the group are its role in ensuring that ideas for new services become international initiatives and collaborations rather than a host of separate, unconnected but overlapping services across the community, and its role in providing advice, such as that given to representatives from the Infrastructure as a Service (IaaS) team on how to improve and increment the adoption of this service in a variety of countries.

SIG-NOC

Feedback on SIG-NOC indicates its value as a forum for sharing challenges, for discussion, exchanging ideas, learning from colleagues and helping its members to grow in their professional role. It also conducts a survey every three years on the software tools the NOCs use to operate networks and services. The reports arising from these surveys make it easy to see how NOCs are evolving, and help identify and predict changes and trends. The surveys have shown an increase across the NREN NOCs in the use of tools related to business intelligence, automation, and security, while new challenges likely to be of interest to the community is the power efficiency of data centres and infrastructure.

SIG-Multimedia

SIG-Multimedia has an important role to play in expanding the expertise of NRENs and organisations by learning from each other. During the COVID-19 pandemic, people were forced to switch to virtual meetings and conferences, and the experiences and recommendations shared by multimedia experts during that period proved extremely valuable for NRENs offering virtual collaboration tools and services. Its value is evident too in the applications and services developed within the community, such as eduMEET and eduTURN. These are aimed at organisations that can handle daily maintenance of on-premise installations on their own infrastructure – for their own users. These tools and services address the needs of the community as reported by its representatives, such as users and their organisations. The eduMEET development was accelerated and supported by the community during the beginning of the pandemic and was offered as part of the openUp2U offering.

SIG-NGN

SIG-NGN, with an average of 85+ attendees, supports global collaboration to advance networking and is an open forum in which to learn about future technologies and get a deeper understanding of issues that the network technology experts might not have time to explore in their daily routine. These include 5+ year predictions for optical and packet switched networking, new use cases for R&E networks, new technology such as quantum and satellite networking, and programmable networking technologies such as FPGAs and P4 switches. The group meetings bring in also the users' and researchers' needs for network technology advances. For example, one of the projects funded by the 2021 GÉANT Innovation Programme, RaQSaC – RaptorQ-based data transport for low earth orbit Satellite Constellations, was discussed, together with the HyDRON project from the European Space Agency, when the group addressed topics around Low Orbit Satellites [[SIG-NGN_May2022](#)].

TF-EDU

TF-EDU was the first group to instigate the mapping of European NREN educational activities and services by developing the annual survey, which produces reports on challenges faced and trends identified from the four-year overview of the results. The Task Force provides a forum for collaboration where synchronisation enhances the efficiency and the speed of development, such as the creation of openUp2U at the beginning of the COVID-19 pandemic. openUp2U was developed and offered to all schools and universities across Europe in direct response to the pandemic, and constituted a digital learning environment, including tools for course management, videoconferencing and file sharing that were integrated into a learning management system [openUp2U]. The service was set up specifically to provide support for educational institutions who had no alternative solution for remote teaching and learning during a very challenging 2020, and was provided through voluntary efforts and sponsorship from GÉANT, NRENs, universities and Amazon Web Services (AWS). Whilst openUp2U was originally intended to run until the end of 2020, it was extended for three months in early 2021, and discontinued from 14 April 2021. Before it was discontinued, the usage was checked; it had reduced by the beginning of 2021, and the remaining users were contacted and offered the option to migrate to the Up2DigiSchool project [Up2DigiSchool].

6.14 Reach

The GÉANT Community Programme enables open participation regardless of the interested participants' country, organisation or role. It is noticeable that having online or hybrid meetings, such as during the pandemic, made it possible for a broader geographical reach, resulting in at least 77 countries being represented in Task Force and Special Interest Group meetings (Table 6.1 below), and higher participant numbers than before (Figure 6.1 above). This feedback also resonated with the impact on the work of the International Relations team and the Partner Relations team. Members who were normally not able to engage with the activities became active parts of the groups and more people from the same organisation were also able to join.

TF/SIG	No. of countries/regions
TF-CSIRT	54
TF-EDU	49
SIG-Marcomms	44
SIG-NGN	34
SIG-NOC	33
SIG-MSP	29
TF-eHealth	28
SIG-Multimedia	26
SIG-ISM	26
TF-DLT	20

TF/SIG	No. of countries/regions
TF-RED	13

Table 6.1: Number of countries/regions represented at TFs/SIGs

7 GÉANT Innovation Programme

7.1 Concept

As mentioned in Section 5.4, the GÉANT Innovation Programme (GIP) was added to the portfolio of the GÉANT Community Programme in 2021. With annual funding of EUR300k provided by the GÉANT Association, the initiative supports specific research projects carried out by the GÉANT Community, i.e. GÉANT Member NRENs, universities, research institutions or other such legal entities to which a GÉANT Association Member NREN provides services.

The GIP is a unique opportunity to enable initial development, establish a proof of concept or testing of new ideas, with lightweight administrative constraints. The programme offers researchers flexibility to focus on any subject area or topic providing that it falls within GÉANT's community remit. Proposals can, for example, draw from networking, cloud, security, trust and identity, and education, but the primary focus and impact must benefit the GÉANT European research and education community. The programme particularly encourages ambitious and novel research proposals addressing new concepts and techniques and those with the potential for significant scientific or societal and economic impact. Funding decisions are based on a number of criteria, including: quality, innovation, potential impact and value for money.

Similar to the TF/SIGs, the time and effort needed for the co-ordination of the programme is funded through the project, although the funding itself is provided by the Association members rather than the EC. In this way we leverage the skills and experience of the team to stimulate innovation in a new way. The outputs and outcomes are shared across the project, with each of the Work Package leaders being involved in the appraisal of projects to ensure no duplication and only synergistic links with other elements of the GN4-3 project.

The call for proposals is for research project funding of up to EUR30k, for a maximum duration of 5–6 months with possible extensions up to 9 months.

7.2 Implementation

Full details of how the programme is implemented are provided on the dedicated GIP website [[GIP](#)], including the timeline (for the latest iteration), who can apply and how to apply. Supporting materials provided include:

- *GÉANT Innovation Programme Guide for Applicants* [[GIP GfA](#)], which covers aspects such as scope and contents of proposals, how to prepare and submit a proposal, proposal evaluation

and selection, eligibility, funding of participation, and final report. It also includes a checklist for applicants to check their proposals against, and FAQs.

- Application Form / Proposal Template [[GIP PT](#)].
- Template for the final report to be submitted by successfully funded projects, which includes results achieved, or the reason why they were not achieved, and lessons learned.

As part of the programme process, on acceptance by the evaluation committee of the final report, an interaction with the project coordinator will explore, if necessary, how to carry on further the obtained results.

The GÉANT Innovation Programme was launched on 23 February 2021 at a virtual event with 166 participants. An infoshare was presented to introduce the new programme and encourage new innovative ideas for the benefit of the research and education community [[GIP Infoshare](#)].

The programme is supported logistically by the WP3 Task 4 team and members of the GCC, but funding (EUR300k) is provided by the GÉANT community, from the GÉANT Association budget. There are monthly review points to assess new ideas that are proposed, and regular drop-in sessions for questions and answers with submitters are organised. The programme will remain open until all funds have been allocated.

The GIP is strongly promoted by the Marcomms team through CONNECT Online articles (6 in 2022 and 5 in 2021 – see Appendix B) and via social media.

7.3 Results

7.3.1 2021

In the first year of the GÉANT Innovation Programme, a total of 26 submissions from 15 different countries were received in 3 rounds of calls, as summarised in Table 7.1.

Country	Cloud	Education	Multimedia	Networking	Security	Trust&Identity	Grand Total
Bulgaria	1						1
Croatia		1					1
Czech				1			1
Denmark		1					1
Finland		1					1
Hungary						1	1
Israel					2		2
Italy	1		1	3	2		7
Moldova		1					1
Netherlands						1	1
Poland			2				2
Portugal		1					1
Slovakia				1			1
Spain						2	2

Country	Cloud	Education	Multimedia	Networking	Security	Trust&Identity	Grand Total
UK		1		2			3
Grand Total	2	6	3	7	4	4	26

Table 7.1: Summary of GÉANT Innovation Programme 2021 submissions

In total, 10 projects received funding in 2021, for a total of EUR287,000, or 96% of the budgeted EUR300,000. A list of the projects, showing the organisation and grant, is given in Table 7.2. The funded projects fall under 4 separate categories: Trust & Identity and Education, Security and Privacy, Clouds and Networks, and Multimedia, as shown in Figure 7.1.

All projects finished with their expected outcomes and were showcased in a virtual event in March 2022.

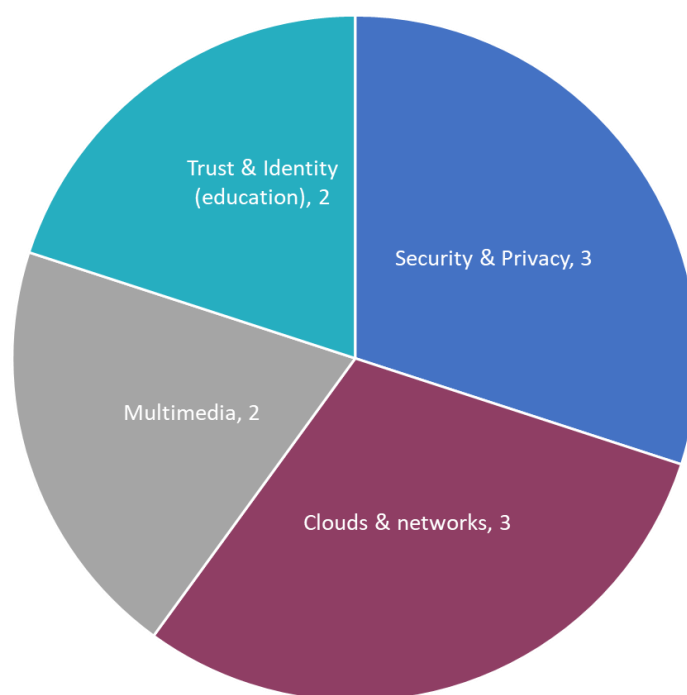


Figure 7.1: GÉANT Innovation Programme 2021 – categories of funded projects

All projects finished with their expected outcomes and were showcased in a virtual event on 3 March 2022 [[GIP21 Showcase](#)].

Title	Organisation / grant
mingleMeet – Interactive meeting space for eduMEET	PSNC, PL / 30.0 K eur

Title	Organisation / grant
Adaptive DNSSEC – DNSSEC: Make or Break Vulnerabilities in DNS	<i>TAU, IL / 30.0 K eur</i>
VoDsync – Synchronous playback of high quality videos in eduMEET sessions	<i>PSNC, PL / 30.0 K eur</i>
eduCLAIMS – educational claims and recommendation letter service with eduGAIN identifiers	<i>BME, HU / 28.0 K eur</i>
PLAS: Platformed Workflows	<i>CNIT, IT / 30.0 K eur</i>
User Controlled SD-WAN Services (UCSS) with Performance Monitoring over GÉANT	<i>CNIT, IT / 30.0 K eur</i>
ABEBox: Privacy Preserving File Sharing Service	<i>URoma2, IT / 30.0 K eur</i>
Design and Implementation of an 802.11 Privacy Preserving Sub-Layer	<i>UniBS, IT / 28,8 K eur</i>
RaQSaC: RaptorQ-based data transport for low earth orbit Satellite Constellations	<i>Sussex University, UK / 30.0 K eur</i>
The impact of EU Digital Identity Wallets on NRENS	<i>SURF, NL / 20.0 K eur</i>

Table 7.2: GÉANT Innovation Programme 2021 – funded projects

Further details of the 2021 funded projects are available on the GIP website at [[GIP_FP](#)].

7.3.2 2022

In the second year of the GÉANT Innovation Programme, a total of 42 submissions from 17 different countries were received, as summarised in Table 7.3; this time around there was only one call.

Country	Cloud	Education	Health	Multimedia	Networking	Security	Trust&Identity	Grand Total
<i>Albania</i>		1						1
<i>Armenia</i>	1							1
<i>Belgium</i>					1			1
<i>Bulgaria</i>		1						1
<i>Czech</i>	1							1

Country	Cloud	Education	Health	Multimedia	Networking	Security	Trust&Identity	Grand Total
<i>Hungary</i>					1			1
<i>Ireland</i>					1			1
<i>Israel</i>					1			1
<i>Italy</i>	1	5	2	3	11			22
<i>Lithuania</i>						1	2	3
<i>Moldova</i>		1						1
<i>Netherlands</i>							1	1
<i>Poland</i>				2	1			3
<i>Portugal</i>		1						1
<i>Serbia</i>					1			1
<i>Spain</i>						1		1
<i>UK</i>					1			1
Grand Total	3	9	2	5	18	2	3	42

Table 7.3: Summary of GÉANT Innovation Programme 2022 submissions

In total, 10 projects received funding in 2022, for a total of EUR293,000, or 97.6% of the budgeted EUR300,000. A list of the projects, showing the organisation and grant, is given in Table 7.4. The funded projects fall under 5 separate categories: Trust & Identity and Education, Security & Privacy, Clouds and Networks, Multimedia, and Health, as shown in Figure 7.2.

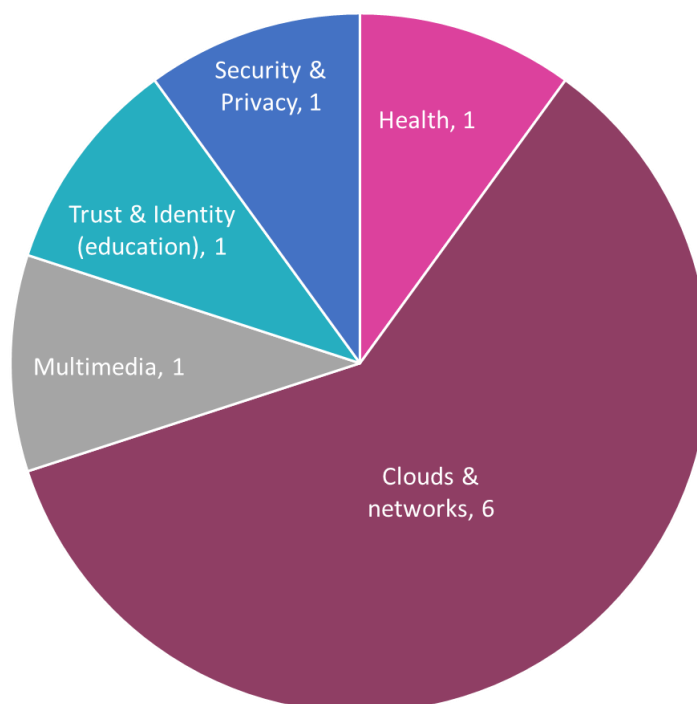


Figure 7.2: GÉANT Innovation Programme 2022 – categories of funded projects

All projects expect to finish with their anticipated outcomes in December 2022, and it is planned to showcase them in a virtual event in March 2023.

Title	Organisation / grant
Artificial Intelligence-based contactless Devices for tele-Rehabilitation and Health	<i>Univacq, IT / 30.0 K eur</i>
eCLAT: eBPF Chains Language And Toolset	<i>UromaTV, IT / 30.0 K eur</i>
PBSPro-Kubernetes Connector for Seamless HPC Submission	<i>MasarykU, CZ / 26.4 K eur</i>
drawOnMeet – Common drawing on any video in eduMEET sessions	<i>PSNC, PL / 30.0 K eur</i>
TCPLS Low-Lat	<i>UCLouvain, BE / 29.1 K eur</i>
Federated Learning-Driven Network and Service Management	<i>BuniT, HU / 28.2 K eur</i>

Title	Organisation / grant
SMART Campus – Building the campus on Digital key identification	VytautasMU, LT / 30.0 K eur
Research and Education Network as a Service for Developing Nations	TCD, IE / 30,0 K eur
SIEVA: SIEM Visibility Assessment	i2CAT, ES / 29.5 K eur
Borderless Data Spaces	Politecnico T, IT / 29.5 K eur

Table 7.4: GÉANT Innovation Programme 2022 – funded projects

Further details of the 2022 funded projects are available on the GIP website at [[GIP FP](#)].

7.3.3 Impact

The GÉANT Innovation Programme delivers value for the NREs by helping new ideas from their member institutions to become completed projects that can potentially provide benefit to the GÉANT and wider research and education community. Results from the 2021 round of projects have already moved on to GÉANT community liaison (i.e. presentations at Task Force / Special Interest Group meetings), been incorporated into services (e.g. eduMEET) and produced valuable lessons learned (Table 7.5).

In addition to the actual outcomes of the completed projects, more visibility about both the GÉANT Innovation Programme and the GÉANT Community Programme has been achieved within the NREN community and the broader research and education community.

Project	Results	Adoption
mingleMeet	Innovative and unique dynamic handling of VC rooms enabling emulation of what happens during meeting breaks	Yes – eduMEET
Adaptive DNSSEC	A much-improved and attack-resistant DNS which is also efficient in terms of speed, maintenance and scalability	Not yet
VoDsync	Innovative and unique solution to provide high quality recorded video playback and handling inside eduMEET	Yes – eduMEET
eduCLAIMS	Provides an easy and scalable secure solution for digital education “claims”, document signature, etc., suitable for less “techie” users. Efficiently reuses GÉANT’s T&I ecosystem in a different area.	Not yet
PLAS	Extends the GÉANT Cloud Flow platform beyond containerised tasks, into platformed tasks (providing open source code). Adds parallelised workload capabilities (needed by bioinformatics and community clouds).	Not yet

Project	Results	Adoption
User-controlled SD-WAN services (UCSS)	<p>Provides transparent SRv6 services – a user-controlled monitored overlay VPN service.</p> <p>Discovery of several issues regarding IPv6 support in NRENs' data centres and firewall systems (operational bottlenecks in the periphery) which need an urgent fix.</p>	No – but value from learning that not viable at this time
ABEBox	<p>A privacy-preserving service add-on for file-sharing was created, which can be used on existing services (commercial off-the-shelf services such as Dropbox, but also ownCloud, etc.).</p> <p>The new results empower end users to properly preserve privacy (no operators usually care about it centrally).</p> <p>Operators and vendors have shown interest in this new solution.</p>	Not yet
802.11 privacy preserving sublayer	<p>Proved in the field that an efficient anti-tracking system can be implemented in Wi-Fi.</p> <p>An open-source working implementation which can be used with any openWi-Fi supporting access point (and no need for any action by users' client devices).</p>	Not yet
RaQSaC	<p>Detailed simulations of next-gen transport protocol for Low Earth Orbit (LEO) satellites.</p> <p>Evaluation of how NRENs could benefit from LEO satellite systems.</p> <p>Study on current situation in LEO above-the-net services providers and protocol maturity.</p> <p>Collaboration has started with Jisc.</p>	Yes – Jisc
EU digital identity wallets impacts	<p>SWOT analysis and hi-level architecture (NRENs vs EU Digital Wallets),</p> <p>Understanding on how to liaise NRENs and EU digital wallets services.</p> <p>Awareness of possible areas that need intervention now during the legislation preparation.</p>	Not yet

Table 7.5: GÉANT Innovation Programme 2021 – results and adoption of funded projects

8 GÉANT Community Award

8.1 Concept

GÉANT honours community members who have made outstanding contributions to collaborative work and the development of services and technologies and who have shared their ideas, expertise and time with the community. It is recognised that such contributions are often provided voluntarily and through the good will of employer organisations.

Presented for the first time in 2012, the Community Award is sponsored by the GÉANT project. This sponsorship provides administrative support, allowing the award to be opened up to nominations from across the community, and facilitates the selection of winners by a panel of judges. The Community Award is a sign of recognition for the individual efforts that make up our community collaborations. It is presented every year at TNC, the GÉANT community's flagship conference.

The GÉANT Community Programme also took ownership of the GÉANT Community Award starting at the end of 2021 and developed a new, more engaging, rewarding and transparent way to bring together the broader research and education community to recognise the contribution from their members. With the new way we have created a more transparent webpage with clear timeline, process and selecting committee and an online submission form for nominations. Also a new process included a shortlist of nominees displayed on the website and the community members adding their supporting votes to the candidates. We have received double amount of nominations and experiences a large support from those voted on the shortlisted nominees. The new process was very well received by both the nominees as well as by the general community members.

8.2 Implementation

As part of the enhanced process, the GÉANT Community Committee proposed a revision of the criteria for nomination:

- Refine the submission process to ensure that the GÉANT Community Award would be given based on well-defined reasoning.
- Enable GÉANT Association staff members to be nominated and be recognised by the community for their lasting impact on the GÉANT community activities. Such nominations would be equal to other shortlisted nominations.

The reasons for enabling GÉANT Association staff members to be able nominated were:

- All community members are in many cases also paid by GÉANT (projects, NREN manpower, etc.) and staff members of the GÉANT Association are considered by the community as members.
- The Award represents the recognition of community members by the community and provides visibility of this recognition for exceptional achievements and contributions.

Other enhancements included giving the GÉANT Community Award a dedicated webpage within the new community website at the beginning of November 2021 (Figure 8.1), with the following benefits:

- The webpage enables nominations to be placed and voted on (the vote results remain hidden to facilitate the community engagement until the final deadline and also for social sensitivity reasons). A submission form for nomination was developed, as well as an anonymised voting system.
- Nominated persons remain visible even after the award deadlines, to show the recognition by the community of their achievements.
- The website clearly explains the timeline, nomination criteria, selection process, the GÉANT Community Award Committee and judging panel, who can nominate, eligibility criteria, and award categories. In addition it gives past award results with supporting content (videos, profiles, articles, etc.) and also recognises the organisations the award winners come from.

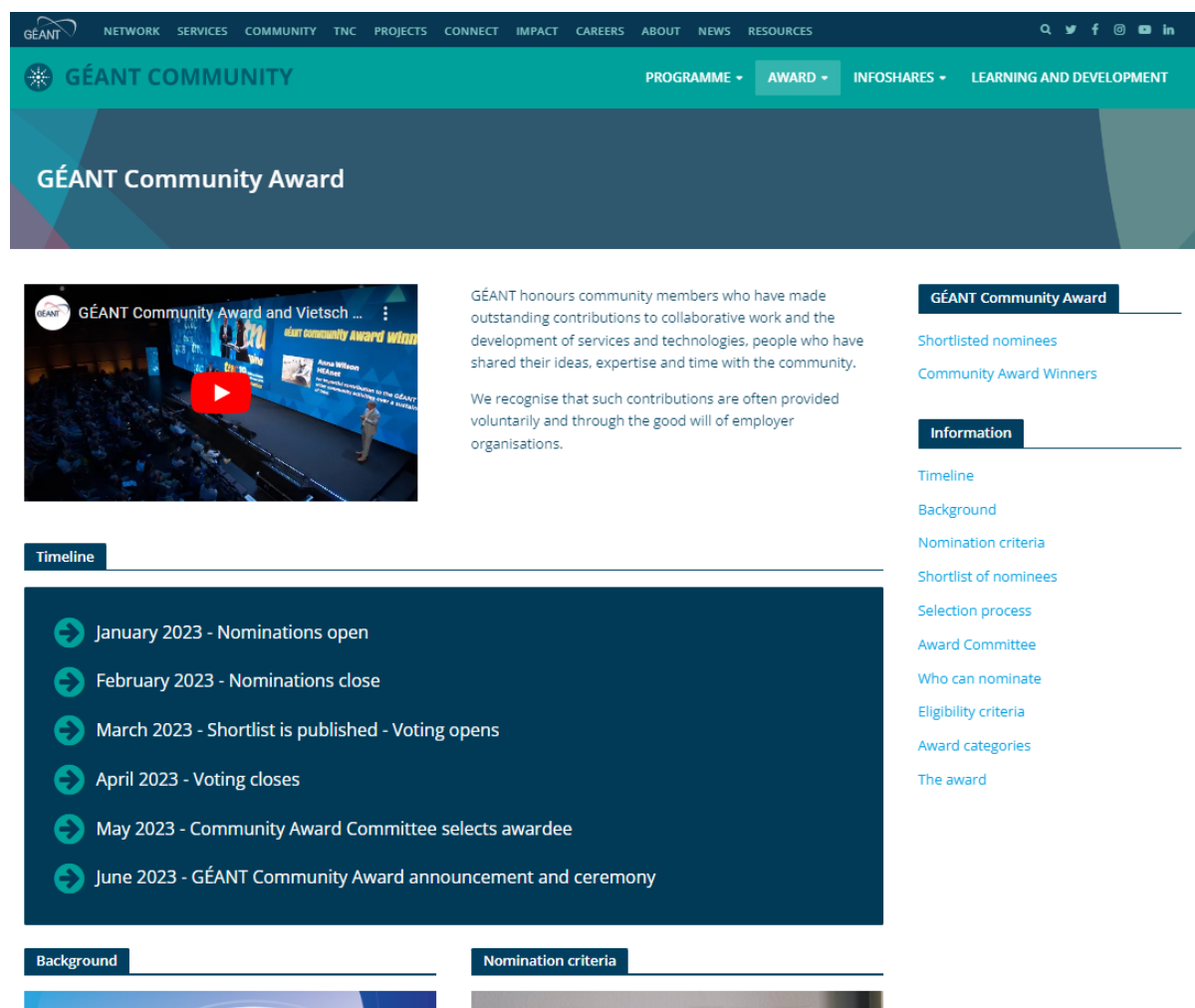


Figure 8.1: GÉANT Community Award webpage

In addition to the improved process and method, more visibility has been given to the GÉANT Community Award to raise its profile. There were 6 dedicated articles in CONNECT Online to promote the award and provide visibility among the broader research and education community, and 1 article in the printed *CONNECT* magazine to celebrate the winners of the Community Award. Besides those articles, the award was also broadly promoted via email to the GÉANT project partners and Community Programme groups, and via social media channels.

8.3 Results

In the first year of the new method and process for the GÉANT Community Award, the number of nomination submissions received increased by more than 50%, as shown in Table 8.1.

2022	2021	2020
20 received	13 received	5 received

2022	2021	2020
20 valid	9 valid	4 valid
12 nomination	8 nomination	4 nomination

Table 8.1: Number of GÉANT Community Award nomination submissions received 2020–2022

The GÉANT Community Award Committee selected 5 shortlisted nominees from the 12 total nominations. The shortlisted nominees were displayed on the website and will remain displayed as 2022 shortlisted nominees [[GCA_SN](#)].

The community was enabled to vote for the shortlisted nominees and a total of 664 valid votes were received. Members from 31 NREs voted and 290 votes were received from the broader community, as shown in Table 8.2.

Nominee	TOTAL votes	Other NREs	Own organisation	Community
Nominee 1	37	11	23	3
Nominee 2	56	16	27	12
Nominee 3	96	12	50	32
Nominee 4	184	90	45	49
Nominee 5	291	19	73	194

Table 8.2: GÉANT Community Award 2022 voting for shortlisted nominees

The GÉANT Community Award Committee then selected the final winners – there were two recipients in 2022 – who were presented with their awards during GÉANT’s annual conference TNC22. The award winners are displayed on the website [[GCA_AW](#)].

Feedback from the award recipients was very favourable about the process and appreciative of the broader recognition by their peers. Paul Dekkers (SURF) commented:

“I was so thrilled to be nominated for the GÉANT Community Award together with outstanding members of our community: such an honour to be part of this group! The voting procedure turned out to be a very nice experience, seeing people within and outside our community showing enthusiasm for the work we do. Winning the award is of course fantastic; I’m so happy that this career and the amazing people I work with in the eduroam community appeared on my path! I am grateful to SURF and the GÉANT community for what we are able to achieve working together.”

Tryfon Chiotis (GÉANT Association) commented:

“I am privileged and excited to receive this award. For the last thirty years, from campus level at NTUA, to national level at GRNET and to international level at GÉANT, working with the GÉANT community is my passion. Together with more than 600 colleagues from

44 countries and driven by a strong sense of community, we deliver the infrastructures and services that enable research and education to excel. This award also goes to all the friends from the GÉANT PMO. Making our GÉANT project a success is teamwork. My heartfelt thanks to all of them.”

This is further supported by follow-up interviews conducted with the two winners [[GCA I PD](#)], [[GCA I TC](#)].

8.4 Impact

As a result of the process enhancements, the GÉANT and broader R&E community feels more ownership and engagement with the Community Award. Furthermore, the award gives the community members more motivation to contribute to collaborative work and the development of services and technologies, and adds more value to sharing their ideas, expertise and time with the community.

The new website and increased promotional activity have given the GÉANT Community Award more visibility and a higher profile.

9 Communicating the Impact of the GÉANT Community Programme

9.1 Concept

The GÉANT Community Programme is a grassroots voluntary activity where topics and issues raised by community experts are discussed and addressed. Those activities are conducted by a niche group of our community and raising awareness about the programme is essential to enhance the broader engagement with the groups as well as support cross-sector involvement. Both the Task Force and Special Interest Group coordinators and GÉANT's marketing and communication team support those efforts via various channels of communication.

9.2 Implementation

Communications activities for the GÉANT Community Programme are agreed and defined in a multi-annual plan by the joint efforts of the Task Force and Special Interest Group coordinators and GÉANT's marketing and communications team.

The objectives of the plan are to:

- Increase the visibility and profile of the GÉANT Community Programme's scope, remit and activities.
- Increase active participation and interest within the NREN community, their constituencies and beyond.
- Support engagement of the target stakeholders for each thematic area.

The plan includes a definition of the communications responsibilities of both groups:

- Task Forces and Special Interest Groups:
 - Promote the group activities via the group mailing list.
 - Write a blog post on the discussions and outcomes of the group meetings.
 - Promote the purpose of the group among the broader research and education community at other events and conferences.
 - Promote cross-sector activities were relevant among their respective groups.
 - Promote other activities such as:

- Innovation Programme
- Community Award
- Marketing and communications team:
 - Promote the group activities, events, results via:
 - Blog posts and articles.
 - Social media promotions.
 - Infoshares.
 - Promote the purpose of the groups via:
 - Interviews.
 - Social media promotions.
 - Infoshares.
 - Promote the GÉANT Innovation Programme via:
 - Blog post.
 - Interviews.
 - Social media promotion.
 - Infoshares.
 - Promote the GÉANT Community Award via:
 - Blog post.
 - Interviews.
 - Social media promotion.
 - Infoshares.

In addition, a short video has been created to explain the GÉANT Community Programme to the broader research and education community [[GCP video](#)].

Furthermore, the overall visibility of the GÉANT Community Programme has been improved by creating a dedicated area as part of the new GÉANT Community website, launched in September 2021 [[GC website](#)], [[GCP website](#)].

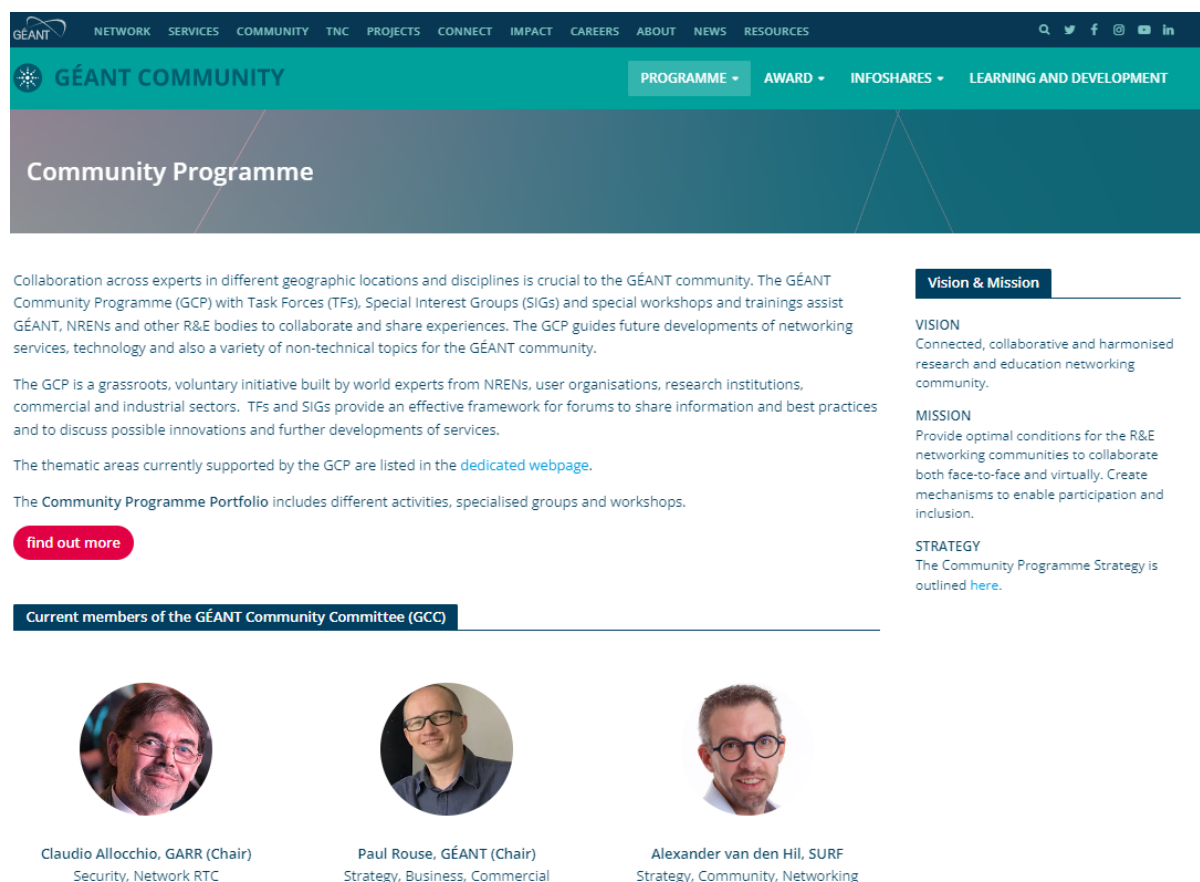


Figure 9.1: GÉANT Community Programme website

The website explains the vision and mission of the GÉANT Community Programme; shows the current members of its oversight body, the GÉANT Community Committee; presents the GÉANT Community Programme strategy; and presents the portfolio of activities, groups and workshops. It displays more clearly the thematic areas currently covered and their respective groups [GCP TA]. Dedicated webpages have been created for the Innovation Programme [GIP] and the Community Award [GCA]. The website also shows the latest tools developed as a result of the Community Programme activities [GCT].

9.3 Results

During the period from January 2019 to December 2022, the following GCP promotions and communications materials have been produced:

- New dedicated community website [GC website].
- Promotional video about the GÉANT Community Programme [GCP video].
- 6 dedicated blog posts on the 2022 GÉANT Community Award, including two interviews with the winners.
- 13 dedicated blog posts on the GÉANT Innovation Programme.

- 12 dedicated blog posts to promote and explain the concept of the GÉANT Community Programme
- Dedicated interviews with Task Force / Special Interest Group / collaborative activity representatives, including:
 - TF-DLT.
 - TF-EDU.
 - SIG-NOC.
 - SIG-MSP.
 - SIG-Multimedia.
 - REFEDS.
- In total, 114 posts tagged “Community Programme” since July 2019. This includes interviews, event posts, infoshares, past Community Awards, and various other articles.
An overview of all blog posts from 2019 to 2022 is provided in Appendix B.

10 Conclusions

Throughout GN4-3 there have been a number of areas of improvement and development across the GÉANT Community Programme to ensure that the R&E community is well supported and has all the relevant ways in which to share information, leverage knowledge and stimulate innovation.

The Community Programme is unique in that it is open to all community members (not just those members of the GÉANT Association who are primarily Europe based); this allows a very wide cross-fertilisation and exchange of ideas and experiences. This was particularly important and impactful during the COVID-19 pandemic, when NREs across the globe could share experiences in all relevant subjects, including best practices for Zoom procurements and use of multimedia; communication methodologies; strategies for supporting campuses and supporting Open Science and data centres.

In particular, the addition of the GÉANT Innovation Programme to the portfolio has enabled projects and ideas at earlier technology readiness levels (TRLs) to be explored within the community and for Work Package Leaders in the GÉANT project to meet with new community members (mostly from universities) who are working across similar areas.

Communicating the results of the GÉANT Community Programme in an engaging way has also resulted in additional participants from a wide geographic scope, while holding online or hybrid meetings has also lowered the barrier of entry for those who are unable to travel to face-to-face meetings. Most recently, the addition of Zenodo as a data repository for sharing presentations from the myriad meetings held annually builds up a valuable community tool for ensuring the transparency, openness and impact of the meetings more widely.

The sheer volume of meetings, workshops, trainings and both face-to-face engagement and online communications facilitated by the GÉANT Community Programme means it continues to be a valuable source of sharing, leveraging and stimulating further knowledge and innovation widely across R&E. Meeting and participant numbers have grown year on year, with changing thematic areas covered and explored in response to community needs; this demonstrates that the community continues to find great value in the Programme as a mechanism to connect, collaborate and share knowledge.

Appendix A How the Thematic Areas Are Supported

This appendix lists the Task Forces, Special Interest Groups, workshops and training, collaborative activities, groups or communities, and collaborative services by which each thematic area is supported, as at the end of GN4-3.

Thematic Area	Task Force	Special Interest Group	Workshop and Training	Collaborative Activity / Group / Community	Collaborative Service
Security	TF on Computer Security Incident Response Teams (TF-CSIRT) – Coordinating training, services and knowledge exchange for security teams worldwide [TF-CSIRT]	SIG on Information Security Management (SIG-ISM) – Developing security expertise and excellence within the NREN community [SIG-ISM]		Wise Information Security for Collaborating e-Infrastructures (WISE) – Community that aims to enhance best practice in information security for IT infrastructures for research [WISE]	
Identity and Privacy	TF on Distributed Ledger Technologies (TF-DLT) – A forum to explore the usage of distributed ledger technologies (DLT) as well as distributed identity and self sovereign identity (SSI) in the context of the research and			Global eduroam Governance Committee (GeCC) – Sets technical and organisational standards for the eduroam service and authorises compliant roaming operators to provide eduroam around the world [GeCC]	

Thematic Area	Task Force	Special Interest Group	Workshop and Training	Collaborative Activity / Group / Community	Collaborative Service
	the education community [TF-DLT]			Research and Education Federations (REFEDS) – Group that aims to represent the mutual needs of research and education identity federations worldwide in the ever-growing space of access and identity management	
Education	TF on Educational Services and Activities (TF-EDU) – Addressing common issues NRENs and education-focused organisations are dealing with regarding their educational services and activities [TF-EDU]				
Network Services and Technologies		SIG on Next-Generation Networks (SIG-NGN) — Knowledge exchange and collaboration on developments in networking technologies [SIG-NGN] SIG on Network Operations Centres (SIG-NOC) – Sharing and creating common best practices for the organisation and management of Network Operations Centres [SIG-NOC]			

Thematic Area	Task Force	Special Interest Group	Workshop and Training	Collaborative Activity / Group / Community	Collaborative Service
Media Services		SIG on Multimedia Applications (SIG-Multimedia) – Facilitating technology and service interoperability and sharing knowledge about multimedia solutions [SIG-Multimedia]	Network Performing Arts Production Workshop (NPAPWS) – Annual workshops exploring the potential of using advanced networks for arts and humanities [NPAPWS]		
Cloud Services		SIG on Cloud Interoperable Software Stacks (SIG-CISS) – Sharing and collaborating on cloud infrastructure software stacks, platforms and research workflows [SIG-CISS]		Open Cloud Mesh (OCM) – A joint international initiative under the umbrella of the GÉANT Association that is built on the open Federated Cloud Sharing application programming interface (API) taking Universal File Access beyond the borders of individual clouds and into a globally interconnected mesh of research clouds without sacrificing any of the advantages in privacy, control and security an on-premises cloud provides [OCM]	
Organisational Services		SIG on Marketing Communications (SIG-Marcomms) – Sharing and collaborating on marketing,	Public Affairs Workshop (PAW) – Workshop on how to achieve visibility and influence the priorities of policy makers [PAW]		

Thematic Area	Task Force	Special Interest Group	Workshop and Training	Collaborative Activity / Group / Community	Collaborative Service
		communications and public relations [SIG-Marcomms] SIG on Management of Service Portfolios (SIG-MSP) – Supporting management across the product lifecycle and sharing service ideas [SIG-MSP]			
Support Services	TF on Research Engagement Development (TF-RED) – Developing frameworks, methods and best practices for participating NREN/research organisations to better collaborate together when engaging with national and international research communities, so as to grow an NREN’s business as well as gain an understanding of the needs and trends of research communities more broadly [TF-RED]				
Health Services	TF on eHealth (TF-eHealth) - Exploits synergies among the NRENs and assesses the possibility of joint efforts on the items identified by the GÉANT community as most				

Thematic Area	Task Force	Special Interest Group	Workshop and Training	Collaborative Activity / Group / Community	Collaborative Service
	relevant for eHealth [TF-eHealth]				

Table A.1: Activities by which thematic areas are supported as at the end of GN4-3

Appendix B Overview of GCP Blog Posts 2019–2022

Topic area	Activity	Date	Link
2022			
GÉANT Innovation Programme	GÉANT Innovation Programme	05-12-2022	https://connect.geant.org/2022/12/05/geant-innovation-programme-call-for-proposals-is-open
GÉANT Innovation Programme	GÉANT Innovation Programme	29-11-2022	https://connect.geant.org/2022/11/29/note-it-down-the-geant-innovation-programme-is-coming-back-in-december
Identity & Privacy	REFEDS	29-11-2022	https://connect.geant.org/2022/11/29/interview-heather-flanagan-member-of-refeds-and-owner-of-spherical-cow-consulting
Organisational services	SIG-Marcomms	28-11-2022	https://connect.geant.org/2022/11/28/sig-marcomms-how-hpc-communications-support-the-supercomputing-community-21-22-february-2023
Cloud services	SIG-CISS	21-11-2022	https://connect.geant.org/2022/11/22/9th-sig-ciss-meeting-online-28-november-2022
Network technologies	Infoshares	21-11-2022	https://connect.geant.org/2022/11/18/infoshare-scion-access-for-universities-and-research-institutes-24-nov-2022
GÉANT Community Award	GÉANT Community Award	14-11-2022	https://connect.geant.org/2022/11/16/interview-with-paul-dekkers-surf
GÉANT Innovation Programme	GÉANT Innovation Programme	14-11-2022	https://connect.geant.org/2022/11/15/10-unique-and-innovative-projects-supported-by-the-geant-innovation-programme-in-2022
Network technologies	Infoshares	14-11-2022	https://connect.geant.org/2022/11/15/infoshare-in-band-network-telemetry-measurements-24-nov-2022
Identity & Privacy	TF-DLT	14-11-2022	https://connect.geant.org/2022/11/15/interview-with-the-chairs-of-the-task-force-on-distributed-ledger-technologies
Identity & Privacy	Infoshares	14-11-2022	https://connect.geant.org/2022/11/14/infoshare-new-intellectual-property-rights-ipr-policy-for-the-geant-project-25-november-2022

Topic area	Activity	Date	Link
Network technologies	Infoshares	14-11-2022	https://connect.geant.org/2022/11/14/infoshare-quantum-key-distribution-deployments-25-november-2022
Network technologies	SIG-NOC	05-11-2022	https://connect.geant.org/2022/11/03/interview-with-ana-medina-barahona-senior-network-engineer-at-rediris-and-member-of-sig-noc
Organisational services	SIG-MSP	05-11-2022	https://connect.geant.org/2022/10/26/foresight-and-sustainability-for-nrens-sig-msp-met-in-tbilisi
Network technologies	Infoshares	05-11-2022	https://connect.geant.org/2022/10/26/argus-infoshare-28th-november
One-off Workshops	One-off Workshops	05-11-2022	https://connect.geant.org/2022/10/26/open-source-software-licensing-workshop-for-software-developers-23-24-nov-2022
Organisational services	SIG-MSP	05-11-2022	https://connect.geant.org/2022/10/26/sustainability-and-foresight
Network technologies	Infoshares	05-10-2022	https://connect.geant.org/2022/10/11/infoshare-maturity-model-for-orchestration-automation-and-virtualisation-21-october-2022
Organisational Services	SIG-Marcomms	05-10-2022	https://connect.geant.org/2022/10/06/social-media-branding-marcomms-teams-sig-marcomms-autumn-meeting-in-a-nutshell
Network technologies	SIG-NOC	05-10-2022	https://connect.geant.org/2022/10/03/kilowatt-per-bit-how-hungry-is-your-network-16-17-november-2022
Infoshares	Infoshares	05-10-2022	https://connect.geant.org/2022/09/06/call-for-infoshare-share-your-idea-with-the-community
Cloud services	SIG-CISS	05-09-2022	https://connect.geant.org/2022/08/03/sig-ciss-meeting-alongside-nordunet-conference-in-reykjavik-16-september-2022
Health	TF-eHealth	05-08-2022	https://connect.geant.org/2022/07/12/the-ehealth-task-force-one-year-on
Organisational Services	SIG-Marcomms	05-08-2022	https://connect.geant.org/2022/07/11/join-the-conversation-on-social-media-campaigns-marcomms-brand-management-sig-marcomms-oct-4-5-in-brussels
Organisational Services	SIG-Marcomms	05-07-2022	https://connect.geant.org/2022/06/23/sharing-laugh-stories-and-ideas-sig-marcomms-at-tnc22-in-a-nutshell
GÉANT Community Award	GÉANT Community Award	05-07-2022	https://connect.geant.org/2022/06/14/2022-geant-community-award-celebrating-our-communitys-silent-heroes

Topic area	Activity	Date	Link
Network technologies	SIG-NGN	05-07-2022	https://connect.geant.org/2022/06/10/sig-ngn-meeting-future-network-architectures-september-12-2022
Organisational Services	SIG-MSP	05-07-2022	https://connect.geant.org/2022/06/08/sig-msp-on-foresight-and-sustainability-in-re-10-11-october-2022
Network technologies	Infoshares	05-07-2022	https://connect.geant.org/2022/06/06/infoshare-management-and-monitoring-of-time-frequency-services-21-june-2022
Health	TF-eHealth	05-07-2022	https://connect.geant.org/2022/06/01/training-ehealth-data
Educational services	TF-EDU	05-06-2022	https://connect.geant.org/2022/05/17/tf-edu-annual-community-meeting-at-tnc22-june-13-2022
Identity & Privacy	Infoshares	05-05-2022	https://connect.geant.org/2022/05/05/infoshare-ipr-policy-final-conclusions-10-may-2022
Network technologies	Infoshares	05-04-2022	https://connect.geant.org/2022/04/22/infoshare-campus-network-management-as-a-service-cnaas-4-may-2022
Organisational Services	SIG-Marcomms	05-04-2022	https://connect.geant.org/2022/04/22/sig-marcomms-finally-meets-again-live-in-trieste-17-june-2022
Media services	SIG-Multimedia	05-04-2022	https://connect.geant.org/2022/04/22/immersive-visual-experiences-for-re-sig-multimedia-meets-on-24-may-2022
Identity & Privacy	Infoshares	05-04-2022	https://connect.geant.org/2022/04/06/infoshare-ipr-policy-19-april-2022
Organisational Services	SIG-Marcomms SIG-MSP	05-04-2022	https://connect.geant.org/2022/04/04/nrens-explore-opportunities-and-challenges-in-training-sig-marcomms-sig-msp-joint-meeting
Network technologies	SIG-NOC	05-04-2022	https://connect.geant.org/2022/04/04/sig-noc-to-host-in-person-event-in-cambridge-uk-10-11-may-2022
Network technologies	SIG-NGN	05-04-2022	https://connect.geant.org/2022/04/01/7th-sig-ngn-meeting-blog-stepping-outside-the-frame
Network technologies	SIG-NGN	05-04-2022	https://connect.geant.org/2022/03/29/reaching-where-the-fibre-cant-sig-ngn-meeting-on-23-may
GÉANT Innovation Programme	GÉANT Innovation Programme	05-03-2022	https://connect.geant.org/2022/03/04/geant-innovation-programme-2021-winners-showcase-results-during-online-meeting

Topic area	Activity	Date	Link
GÉANT Community Award	GÉANT Community Award	05-02-2022	https://connect.geant.org/2022/02/16/2022-geant-community-award-have-you-sent-your-nomination
Organisational Services	SIG-Marcomms SIG-MSP	05-02-2022	https://connect.geant.org/2022/02/09/sig-marcomms-spring-meeting-with-joint-sig-msp-session-21-22-march
GÉANT Innovation Programme	GÉANT Innovation Programme	05-02-2022	https://connect.geant.org/2022/02/07/the-geant-innovation-programme-presents-the-2021-awarded-projects-during-virtual-showcase-3-march-2022
Identity & Privacy	TF-DLT	05-02-2022	https://connect.geant.org/2022/02/02/the-task-force-on-distributed-ledger-technologies-meets-on-february-21
GÉANT Community Programme	GÉANT Community Programme	05-02-2022	https://connect.geant.org/2022/01/26/the-geant-community-programme-the-multiplier-effect
Media services	SIG-Multimedia	05-01-2022	https://connect.geant.org/2022/01/19/sig-multimedia-the-way-into-the-metaverse-22-february-2022
Network technologies	SIG-NGN	05-01-2022	https://connect.geant.org/2022/01/19/sig-ngn-stepping-outside-the-frame-15-february-2022
GÉANT Community Programme	GÉANT Community Programme	05-01-2022	https://connect.geant.org/2022/01/19/the-geant-community-programme-ideas-that-turn-into-realities
Infoshares	Infoshares	05-01-2022	https://connect.geant.org/2022/01/19/it-is-time-for-your-topic-to-shine-propose-an-infoshare
GÉANT Community Award	GÉANT Community Award	05-01-2022	https://connect.geant.org/2022/01/12/nominations-open-for-the-2022-geant-community-award
GÉANT Community Programme	GÉANT Community Programme	05-01-2022	https://connect.geant.org/2022/01/12/the-geant-community-programme-who-is-it-for
GÉANT Community Programme	GÉANT Community Programme	05-01-2022	https://connect.geant.org/2022/01/05/the-geant-community-programme-part-1-added-value-and-impact
GÉANT Innovation Programme	GÉANT Innovation Programme	05-01-2022	https://connect.geant.org/2022/01/04/the-geant-innovation-programme-is-coming-back-in-january-2022-copy
2021			
Network technologies	SIG-NGN	05-12-2021	https://connect.geant.org/2021/12/17/special-interest-group-on-next-generation-network-meeting-beyond-100g

Topic area	Activity	Date	Link
GÉANT Community Programme	GÉANT Community Programme	05-12-2021	https://connect.geant.org/2021/12/10/the-geant-community-programme-explained-at-virtual-infoshare
GÉANT Innovation Programme	GÉANT Innovation Programme	05-12-2021	https://connect.geant.org/2021/12/06/the-geant-innovation-programme-is-coming-back-in-january-2022
Network technologies	SIG-NOC	26-11-2021	https://connect.geant.org/2021/11/26/operational-challenges-in-the-new-normal-sig-noc-meets-on-dec-15
GÉANT Community Programme	Infoshares	17-11-2021	https://connect.geant.org/2021/11/17/infoshare-geant-community-programme-7-december-2021
Support Services	TF-RED	09-11-2021	https://connect.geant.org/2021/11/09/develop-research-engagement-with-tf-red
Network technologies	SIG-NGN	08-11-2021	https://connect.geant.org/2021/11/08/the-special-interest-group-on-next-generation-networks-is-up-and-running-again
Support Services	TF-RED	03-11-2021	https://connect.geant.org/2021/11/03/task-force-on-research-engagement-development-gathered-in-autumn-all-hands
Organisational Services	SIG-MSP	27-09-2021	https://connect.geant.org/2021/09/27/sig-msps-autumnal-event-on-current-and-future-plans-for-community-based-services
Infoshares	Infoshares	25-08-2021	https://connect.geant.org/2021/08/25/geant-infoshares-are-coming-back-for-a-second-season
Health	TF-eHealth	21-07-2021	https://connect.geant.org/2021/07/21/a-new-task-force-on-ehealth-joins-the-geant-community-programme
GÉANT Innovation Programme	GÉANT Innovation Programme	26-05-2021	https://connect.geant.org/2021/05/26/geant-innovation-programme-submit-your-innovative-idea-by-may-28th
GÉANT Community Programme	Infoshares	25-05-2021	https://connect.geant.org/2021/05/25/infoshare-geant-community-programme-26-may-2021
Organisational services	SIG-Marcomms	19-05-2021	https://connect.geant.org/2021/05/19/how-can-research-marketing-communications-support-each-other
Infoshares	Infoshares	28-04-2021	https://connect.geant.org/2021/04/28/geant-infoshares-part-of-the-new-normal-that-we-like-april-and-may-2021-schedule

Topic area	Activity	Date	Link
Organisational services	SIG-MSP	21-04-2021	https://connect.geant.org/2021/04/21/sig-msp-meets-again-compendium-covid-relief-funds-and-eduteams
GÉANT Community Award	GÉANT Community Award	10-03-2021	https://connect.geant.org/2021/03/10/2021-geant-community-award-nominations-open-today
Infoshares	Infoshares	24-02-2021	https://connect.geant.org/2021/02/24/infoshares-sharing-knowledge-for-the-benefit-of-the-geant-community-march-2021-schedule
GÉANT Innovation Programme	GÉANT Innovation Programme	24-02-2021	https://connect.geant.org/2021/02/24/geant-innovation-programme-call-for-proposals-now-open
GÉANT Innovation Programme	GÉANT Innovation Programme	15-02-2021	https://connect.geant.org/2021/02/15/infoshare-community-and-innovation-programme-23-feb-2021
GÉANT Innovation Programme	GÉANT Innovation Programme	03-02-2021	https://connect.geant.org/2021/02/03/geant-innovation-programme-supporting-innovative-ideas-from-the-geant-community
Network Technologies	SIG-NOC	03-02-2021	https://connect.geant.org/2021/02/03/from-on-prem-to-the-cloud-and-from-the-cloud-back-to-the-office
Organisational services	SIG-MSP	21-01-2021	https://connect.geant.org/2021/01/21/spotlight-on-trust-identity-at-sig-msps-third-virtual-meeting
2020			
Infoshares	Infoshares	22-12-2020	https://connect.geant.org/2020/12/22/infoshares-sharing-knowledge-for-the-benefit-of-the-geant-community-january-2021-schedule
Educational services	TF-EDU	17-12-2020	https://connect.geant.org/2020/12/17/the-importance-of-standards-within-the-edtech-ecosystem
Educational services	TF-EDU	02-12-2020	https://connect.geant.org/2020/12/02/6th-tf-edu-virtual-meeting-data-and-analytics-8-dec-2020
Infoshares	Infoshares	25-11-2020	https://connect.geant.org/2020/11/25/infoshares-sharing-knowledge-for-the-benefit-of-the-geant-community
Identity & Privacy	SIG-ISM	04-11-2020	https://connect.geant.org/2020/11/04/sig-ism-wise-joint-workshop-were-all-in-this-together
Identity & Privacy	SIG-ISM	23-10-2020	https://connect.geant.org/2020/10/23/sig-ism-and-wise-unite-forces-in-a-two-day-online-workshop

Topic area	Activity	Date	Link
Educational services	TF-EDU	14-10-2020	https://connect.geant.org/2020/10/14/education-and-the-digital-world-tf-edu-meets-again
Identity & Privacy	TF-CSIRT	02-10-2020	https://tf-csirt.org/2020/10/candidates2020/
Organisational services	SIG-MSP	02-10-2020	https://connect.geant.org/2020/10/02/sig-msp-moves-forward-ocre-open-science-and-digital-innovation-hubs-on-the-agenda-of-the-groups-second-virtual-meeting
Identity & Privacy	TF-CSIRT	16-09-2020	https://connect.geant.org/2020/09/16/tf-csirt-is-turning-20
Media Services	SIG-Multimedia	12-06-2020	https://connect.geant.org/2020/06/12/how-covid-changed-video-conferencing
GÉANT Community Award	GÉANT Community Award	11-06-2020	https://connect.geant.org/2020/06/11/2020-geant-community-award-multiple-celebrations
Educational services	TF-EDU	04-06-2020	https://connect.geant.org/2020/06/04/4th-tf-edu-virtual-meeting-finding-the-balance-9th-june-1100-1600-cest
GÉANT Community Award	GÉANT Community Award	03-06-2020	https://connect.geant.org/2020/06/03/2020-geant-community-award-save-the-date-copy
Identity & Privacy	TF-CSIRT	01-06-2020	https://connect.geant.org/2020/06/01/virtual-tf-csirt
GÉANT Community Award	GÉANT Community Award	27-05-2020	https://connect.geant.org/2020/05/27/2020-geant-community-award-save-the-date
Identity & Privacy	SIG-ISM	06-05-2020	https://connect.geant.org/2020/05/06/the-virtual-sig-ism-wise-trilogy
Identity & Privacy	TF-CSIRT	27-04-2020	https://tf-csirt.org/2020/04/malaga2020/
GÉANT Community Programme	GÉANT Community Cafe	15-04-2020	https://connect.geant.org/2020/04/15/welcome-to-the-geant-community-cafe
GÉANT Community Award	GÉANT Community Award	30-03-2020	https://connect.geant.org/2020/03/30/2020-geant-community-award-voting-deadline-extended-to-3-april-2020
Collaborative Activities	REFEDS	27-03-2020	https://connect.geant.org/2020/03/27/covid-19-call-to-action-refeds-needs-your-help

Topic area	Activity	Date	Link
GÉANT Community Programme	GÉANT Community Programme	26-03-2020	https://connect.geant.org/2020/03/26/claudio-allochio-elected-as-the-new-geant-community-committee-chair
Organisational Services	SIG-MSP	23-03-2020	https://connect.geant.org/2020/03/23/south-east-europe-and-sig-msp-participants-gather-in-istanbul
GÉANT Community Programme	GÉANT Community Programme	18-03-2020	https://connect.geant.org/2020/03/18/geant-community-pulls-together-amidst-covid19-challenge
Support Services	TF-RED	11-03-2020	https://connect.geant.org/2020/03/11/task-force-on-research-engagement-development-announces-next-all-hands
GÉANT Community Award	GÉANT Community Award	26-02-2020	https://connect.geant.org/2020/02/26/nominations-open-for-2020-geant-community-award
Educational services	TF-EDU	19-02-2020	https://connect.geant.org/2020/02/19/the-task-force-for-educational-services-and-activities-tf-edu-is-born
GÉANT Community Programme	GÉANT Community Programme	04-02-2020	https://connect.geant.org/2020/02/04/lets-talk-about-the-geant-community-programme
2019			
Support Services	TF-RED	11-07-2019	https://connect.geant.org/2019/07/11/task-force-for-research-engagement-development-discusses-future-activities
Identity & Privacy	TF-CSIRT	11-02-2019	https://tf-csirt.org/2019/02/11/winter-wonderland-for-tf-csirt-56/
Identity & Privacy	SIG-ISM	29-04-2019	https://blog.geant.org/2019/04/29/intense-three-day-information-security-management-meeting-we-should-do-this-more-often
Identity & Privacy	SIG-ISM	28-10-2019	https://connect.geant.org/2019/10/28/nema-problema-the-slogan-of-the-sig-ism-autumn-meeting-in-zagreb
Identity & Privacy	TF-CSIRT	27-09-2019	https://tf-csirt.org/2019/09/sunsets-sand-and-security-at-the-58th-tf-csirt-meeting/
Identity & Privacy	TF-CSIRT	28-05-2019	https://tf-csirt.org/2019/05/57-blog/
Identity & Privacy	TF-CSIRT	29-03-2019	https://tf-csirt.org/2019/03/tf-csirt-strategy-two-years-on/
Identity & Privacy	TF-CSIRT	01-03-2019	https://tf-csirt.org/2019/03/request-for-quotations-future-tf-csirt/

Topic area	Activity	Date	Link
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Network Technologies	SIG-NOC	19-11-2019	https://connect.geant.org/2019/11/19/10th-sig-noc-meeting-how-to-be-successful-and-maintain-the-competitive-edge
Network Technologies	SIG-NOC	18-12-2019	https://connect.geant.org/2019/12/18/noc-noc-what-tools-are-there
Organisational services	SIG-Marcomms	10-02-2019	https://blog.geant.org/2019/02/10/success-and-crisis-preparation-key-for-marketing-communications-community
Organisational services	SIG-Marcomms	25-06-2019	https://connect.geant.org/2019/06/25/visibility-and-value-marketing-communications-community-groups-review-progress
Organisational services	SIG-Marcomms	07-10-2019	https://connect.geant.org/2019/10/07/recruitment-branding-and-video-making-marketing-communications-community-group-september-meeting
Organisational services	SIG-MSP	08-03-2019	https://blog.geant.org/2019/03/08/the-service-portfolios-odyssey-in-cyprus
Organisational services	SIG-MSP	26-09-2019	https://connect.geant.org/2019/09/26/head-for-the-clouds-marketing-and-portfolio-management-in-the-era-of-cloud-services
Network Technologies	SIG-NGN	10-04-2019	https://blog.geant.org/2019/04/10/sig-ngn-in-stockholm
One-Off Workshops	NPAPW	07-05-2019	https://blog.geant.org/2019/05/07/2019-network-performing-arts-production-workshop-at-the-crossroads-of-music-technology-and-science
One-Off Workshops	Educational Technologies and Services	19-11-2019	https://connect.geant.org/2019/11/19/educational-technologies-for-higher-education-notes-from-a-workshop

Table B.2: Communications overview of all blog posts from 2019–2022

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Glossary

AARC	Authentication and Authorisation for Research and Collaboration
APAN	Asia Pacific Advanced Network
API	Application Programming Interface
AUP	Acceptable Use Policy
AWS	Amazon Web Services
BGP	Border Gateway Protocol
BoF	Birds of a Feather
CNaaS	Campus Network as a Service
COBIT	Control Objectives for Information and Related Technology
CSUC	Consorti de Serveis Universitaris de Catalunya (Consortium of University Services of Catalonia)
DNS	Domain Name System
DPDK	Data Plane Development Kit
EBSI	European Blockchain Services Infrastructure
ENISA	European Union Agency for Cybersecurity
EOSC	European Open Science Cloud
FIRST	Forum of Incident Response and Security Teams
FPGA	Field-Programmable Gate Array
GA	General Assembly
GCC	GÉANT Community Committee
GCP	GÉANT Community Programme
GDPR	General Data Protection Regulation
GeCC	Global eduroam Governance Committee
GIP	GÉANT Innovation Programme
GPPC	GÉANT Programme Planning Committee
HAMU	Music and Dance Faculty of the Academy of Performing Arts in Prague
HL-LHC	High-Luminosity Large Hadron Collider
IaaS	Infrastructure as a Service
ICT	Information and Communications Technology
iRODS	Integrated Rule-Oriented Data System
ISO	International Organisation for Standardisation
KPI	Key Performance Indicator
LA	Learning Analytics
LAN	Local Area Network
LEO	Low Earth Orbit
Liqo	An open-source project that enables dynamic and seamless Kubernetes multi-cluster topologies
LMS	Learning Management System

LSST	Large Synoptic Survey Telescope
MD-VPN	Multi-Domain Virtual Private Network
MPLS	Multi-Protocol Label Switching
NIS2	Network and Information Security 2
NPAPWS	Network Performing Arts Production Workshop
NREN	National Research and Education Network
OC	Oversight Committee
OCM	Open Cloud Mesh
OER	Open Educational Resources
OvS	Open Virtual Switch
P4	Programming Protocol-independent Packet Processors
PAIR	Project Annual Internal Review
PDK	Policy Development Kit
PMO	Project Management Office
PoC	Proof of Concept
R&E	Research and Education
RARE	Router for Academia, Research & Education
REFEDS	Research and Education FEDerations
RFQ	Request for Quotation
SC	Steering Committee
SCI	Security for Collaborating Infrastructures
SIG	Special Interest Group
SIG-CISS	Special Interest Group on Cloud Interoperable Software Stacks
SIG-ISM	Special Interest Group on Information Security Management
SIG-Marcomms	Special Interest Group on Marketing Communications
SIG-MSP	Special interest Group on Management of Service Portfolios
SIG-Multimedia	Special Interest Group on Multimedia Applications
SIG-NGN	Special Interest Group on Next-Generation Networks
SIG-NOC	Special Interest Group on Network Operations Centres
SKA	Square Kilometre Array
SLATE	Services Layer at the Edge
SOC	Security Operations Centre
SSI	Self Sovereign Identity
T&F	Time and Frequency
TERENA	Trans-European Research and Education Networking Association
TF	Task Force
TF-CSIRT	Task Force on Computer Security Incident Response Teams
TF-DLT	Task Force on Distributed Ledger Technologies
TF-EDU	Task Force on Educational Activities and Services
TF-eHealth	Task Force on eHealth
TF-RED	Task Force on Research Engagement Development
TI	Trusted Introducer
TNC	The Networking Conference
ToR	Terms of Reference
TRL	Technology Readiness Level
VAaaS	Vulnerability Assessment as a Service
VC	Videoconference
VLE	Virtual Learning Environment

VoD	Video on Demand
VPN	Virtual Private Network
VUCA	Volatile, Uncertain, Complex and Ambiguous
WG	Working Group
WISE	Wise Information Security for Collaborating e-Infrastructures
WP	Work Package
WP3	Work Package 3 User and Stakeholder Engagement
WP3 T4	WP3 Task 4 Community Programme