

# HIGHLIGHTS



This document presents the highlights from Period 1 of the EC-funded GN5-2 project from 1 January 2025 to 31 March 2026 (GN5-2 Period 1). GN5-2 is the second phase implementing the actions defined in the 72-month GN5 Framework Partnership Agreement established between the GÉANT Consortium and the European Commission in 2021.

GÉANT provides Europe's research and education (R&E) community with the connectivity, collaboration, trust and identity, and security services needed to support evidence-based decision making and effective knowledge exchange with their peers within Europe and around the world.

The GÉANT projects are a fundamental element of the European e-infrastructure, supporting digital sovereignty. Through its integrated catalogue of connectivity, collaboration, identity and security services, GÉANT, together with its

National Research and Education Network (NREN) partners, provides users with reliable, secure access to communication, high performance and quantum computing, analysis, storage, cloud applications and other resources, whenever and wherever needed.

The demands of the R&E community are evolving faster than ever in terms of quantity, types of data, and diversity of disciplines. GÉANT's flexible, agile, and long-term approach

remains vital to ensuring they are met. The work of the project increases European data and digital sovereignty, and GÉANT's state of the art network and trust and identity layer are prepared for the expected increase in volume and diversity of data sources and user communities. For over 30 years, this collaboration has strengthened and secured Europe's position as a global research hub.

**Period 1 of GN5-2 delivered excellence in connectivity and related services, extending its reach to strategically important and emerging areas such as high-performance computing, sovereign digital research environment, artificial intelligence, quantum key distribution (QKD) and time and frequency (T&F)**

 **210 FTEs**  
550+ contributors  
38 partners  
43 countries

 **GÉANT**  
9 Work Packages  
38 Tasks  
21 Deliverables  
28 Milestones

**International users such as CERN, ESA, SKA, ECMWF, EUMETSAT, ITER, and research infrastructures EuroHPC, Copernicus, Destination Earth link new user communities to facilitate, extend and maximise the use of the GÉANT network and services to new science communities, data spaces and collaborations**



## Developed collaboration in new fronts

By interconnecting Europe's NRENs and facilitating high-speed links with other regions across the globe, GÉANT connects schools, universities, and the world's largest research infrastructures, enabling scientific discoveries, supporting remote learning, and upskilling communities. GN5-2 Period 1 furthered the reach of its human network through:

**Ongoing alignment with societal goals:** Stakeholder interviews, recommendations and monitoring of project alignment with the UN's Sustainable Development Goals, and digital rights and principles. Responding to the need for greater digital sovereignty.

**Strengthening relationships:** TNC25 and host Jisc welcomed 900 attendees from a record 72 nations, 167 community-wide speakers, 250 unique online participants and 19 commercial partners. The Community Hub supported talks and demos from 73 participants. Global Network Advancement Group collaborated through 10 working groups, 8 global community VCs and a meeting at TNC25 with more than 100 attendees.

Global partnership on network monitoring and management tools was provided through perfSONAR, MetrANOVA and WFO consortiums.

Network eAcademy content is enriched through collaboration with the GlobalNOC, SoBigData, CERN and the HellasQCI project.

**Nurturing talent:** The Future Talent Programme brought 12 students to TNC25. The Emerging NREN Programme (ENP25) successfully brought together 14 participants from 9 countries.

Network eAcademy continued to provide learning sources in the areas of network automation, quantum technologies, and time & frequency with new training tracks on AI and fibre sensing

nmaas platform supports university labs with its vLab use case.

**Increasing visibility:** the CONNECT website achieved its best results to date, welcoming 75,000+ visitors, contributing to a 94% increase in aggregated visitors to all GÉANT websites.

**Highlighting impact:** instilling an "impact culture" and sharing success stories within the project helps value creation, leading to transitions or transformations.

**Promoting gender equality** through the GÉANT Mentoring programme (GEM). GÉANT's 'Meet the Next Generation of Women in STEM' campaign, in parallel with Women's History Month, showcased the diversity, depth and breadth of female representation in the GÉANT community.

**Sharing knowledge and driving innovation:** As part of the Community Programme, 39 events, including 33 SIG meetings (1,966 participants) and 45 infoshares (2,108 participants) took place.

**Developing skills:** GLAD delivered 23 live training events for 292 participants from 43 NRENs, including non-members of GÉANT. The project continues to value, maintain and develop the exceptional skills and experiences of its human resources.

Network eAcademy in WP6 delivered a new metro map, 6 new units, 3 documents, and reviewed 27 units; AI units were made into a new AI eAcademy. Virtual labs continue to be provided via the production nmaas service platform, available for NRENs and Universities.

**Shaping policy:** 16 EU policy consultations submitted. Materials covering secure connectivity, data access, and digital transformation delivered to 65 high-level stakeholders. The fourth iteration of the CEO Track was held at TNC25, welcoming NREN and RREN directors from the international community, enabling strategic discussions at a global level. Regular coordination meetings were also held, including EOSC and EuroHPC, and two policy white papers.



**'Meet the Next Generation of Women in STEM' campaign**

## CONNECT

**75,000+ visitors**

**and 460+ posts**

**Average impressions**

**per post increased**

**by 56% on LinkedIn**

**Equality, Diversity and Inclusion and Gender Equality BoF at TNC25**

**New Special Interest Groups:**

- **Public Affairs**
- **Quantum**
- **Time and Frequency**
- **AI**
- **Campus Networking**

**GÉANT Learning and Development (GLAD) and WP5 delivered two Trust & Identity Mentorship Programmes: TIM25 and TIM26**

**The PLM process continues to provide effective support to GÉANT products and services throughout their lifecycle**

## Increased core network capacity and coverage

GÉANT's foundation is its ultra-high-speed and secure connectivity: a recently refreshed terabit-ready pan-European internet purely for research and education, connecting 43 European countries via our NREN partners. Together we proudly support all science, all innovation, and all thematic areas – including high energy physics, biological research, Earth observation, and much more.

### **Community-centric strategic planning:**

The annual CTO Workshop brought together all technical domains (Network, Trust and Identity, Above the Net and Security) into a single, interactive roadmap event, strengthening cross-domain alignment and shaping technical strategy.

Network evolution studies and workshops, and the Network Infrastructure Advisory Committee (NIAC) meetings set out how the GÉANT infrastructure will evolve.

### **Next-generation network:**

The GÉANT backbone was upgraded with higher capacity, new platforms, and automation, improving performance and scalability. Record-breaking trials (e.g. 400G optics) and expanded intercontinental connectivity strengthened network capability and resilience.

Upgrade of the Western Ring, and core routes outside the Western Ring from 400 Gbps to 800 Gbps. These upgrades strengthen GÉANT's ability to support sustained traffic growth and demanding, data-intensive use cases, including EuroHPC.

Major automation enhancements through GAP and the Workflow Orchestrator, including the introduction of "massive" service migration workflows that enabled multiple services on a port or interface to be migrated in rapid sequence. This helped the migration of GÉANT's IP/MPLS backbone from the legacy Juniper platform to the Nokia SR platform.

The RARE subtask is investigating how network programmability can help in the context of Quantum Key Distribution (QKD).

### **Effective network management:**

Operational systems and tools were modernised, including ticketing, dashboards, analytics, and service management platforms. A new Software Certificates website has been launched.

BRIAN dashboard now shows greater details on levels and types of traffic on NREN networks.

GÉANT-Argus, a specialised frontend based on the Argus WP6 production service, designed specifically for GÉANT NOC operations, marks a further shift towards network automation.

perfSONAR is increasingly seen by the community as the vital active network monitoring tool for multi-domain network performance management with TimeMap zero-footprint tool successfully supporting real-time network performing art events.

Virtual NOC nmaas increases its support to network management and monitoring with new tools, active monitoring and metrics use cases.

### **Service innovation:**

Four services passed through a development gate and delivered improvements with the PLM process and governance.

Service orchestration and management enhancements supported by Maat and GP4L.

19 incubator projects: 3 completed for WP6 and 1 ongoing; 4 started in WP4; 12 ongoing in WP5.

### **Enhanced security:**

Progress was made to protect the network and users in a rapidly evolving threat landscape. NeMo-based DDoS detection and mitigation solution upgraded; continued growth of the use of privacy friendly safe connectivity with eduVPN. Clear guidance on threat intelligence with quarterly CTI reports and sharing of actual attack indicators with 10 partners.

Advanced DNS added, and successful migration of management and telemetry interfaces to the new SNM platform.

### **Non-data service evolution:**

Progress made, particularly T&F infrastructure, including successful demonstration of White Rabbit time transfer over the DWDM L-band, completion of the equipment provider selection for C-TFN, and further development of GÉANT's role in QKD/KMS interoperability and fibre sensing, in a single- and multi-domain scenario.

### **Intercontinental Connectivity:**

Collaboration with the GN5-IC1 project in transitioning from leased capacity circuits to a long-term spectrum and fibre ownership model for intercontinental connectivity, enhancing resilience and long-term stability and reducing reliance on the market.



## Improved and expanded connectivity and collaboration service catalogue

GÉANT's range of user-focused connectivity, collaboration, trust and identity, above-the-net and security services remains vitally important to research, education, and an evolving European e-infrastructure. An agile development approach ensures services continue to meet user needs in a rapidly changing environment, while the PLM framework ensures their quality and relevance.

### Expanding above-the-net services

All 416 contracts from OCRE 2024 Framework were transitioned and are operational. Consumption expanded to 29 countries and the financial use is accelerating.

Above-the-Net Services Strategy Forum set-up, including outreach, stakeholder engagement, and scheduling.

eduMEET software expanded user base as it livestreamed a jazz concert at SXSW EDU in Austin in March 2025 about technology for inclusivity.

Collaboration with global partners including EUNIS and NII/SINET also continued.

### Three major service concepts:

Digital Research Environment (DRE), Sovereign Object Storage, and Data Movement launched and awarded an Incubator call to support them. The DRE passed PLM review, was supported through the 2025 GÉANT Innovation Programme, and was adopted as a core part of the awarded EOSC4All project proposal.

### Leveraging Trust and Identity services

Core trust and identity services such as eduroam and eduGAIN were enhanced, improving resilience, governance, and global interoperability.

**eduroam:** over 9.2 billion national and international authentications.

**eduGAIN:** improved resilience, launched Open ID Federation pilot.

**Core AAI Platform:** The technical platform to bring AAI services to over 750K users from GÉANT community, e-science, research infrastructures, EOSC, HPC and Student Mobility programmes; introducing new advanced features and forefront deployment capabilities; platform of choice for EuroHPC and EOSC projects.

**InAcademia** delivered 5.3 million validations.

**MyAccessID** builds on top of the Core AAI Platform to deliver a common trust and identity layer for Science in Europe being actively used by European Research Infrastructures, EOSC and EuroHPC Federation Platform.

**MyAcademicID** builds on top of the Core AAI Platform to deliver the common trust and identity layer for Education in Europe being actively used by Erasmus mobility programme and University Alliances.

**Innovation:** Above-the-Net, Trust & Identity and NETDEV incubators continued to deliver innovative projects and practical outcomes used by the community.

### Taking GEANT's network and partners' security to the next level

Security Days, the annual security conference, was held with 166 active participants, keynotes, workshops and training.

Security Bootcamp sessions were held in a variety of formats from lightning talks to structured sessions.

Security Baseline now used by 10 NRENs or products.

The Security Innovation Lab became fully operational in February 2026.

Cybersecurity awareness expanded from a featured campaign month to year-round activities.

**ISO/IEC 27001:2022** GÉANT organisation's certification represents an important step in aligning information security practices with the needs of the European research and education sector, as well as broader EU policy and funding frameworks.



**framework was fully implemented, with strong uptake and €140 million consumption in 2025**



**6 new participants and an OpenID Federation Pilot with 13 members**



**Security Days conference was held in Prague in April 2025. Attended by 166 participants from 28 different countries**



**The first three quarterly R&E Cyber Threat Reports were published**

**First international crisis exercise, TALON, was held successfully with 10 participating organisations**

**New GNA-G Network eAcademy Working Group**