

THE GÉANT PROJECT (GN4-3 AND GN4-3N)

HIGHLIGHTS



This document presents the highlights of the EC-funded GN4-3/GN4-3N projects during Period 3 (1 September 2021 to 31 December 2022). GN4-3/GN4-3N form the last of three phases implementing the actions defined in the 68-month Framework Partnership Agreement, established between the GÉANT Consortium and the European Commission that started with GN4-1 in May 2015.

GÉANT's vision is to provide users equal, high-performance network access to the research infrastructures and e-infrastructure resources across Europe.

The GÉANT projects are a fundamental element of the European e-infrastructure. Through its integrated catalogue of connectivity, collaboration, and identity services, GÉANT, together with its National Research and Education Network (NREN) partners, provides users with unconstrained access to communication, computing, analysis, storage, applications, and other resources, whenever and wherever needed.

As GN4-3N refreshes the pan-European network, GN4-3 in parallel continues to deliver excellence in networking services, enables integrated High-Performance Computing, and supports open science, which reinforces Europe as a global research hub, whilst exploring the potential for new network services in areas such as Quantum Key Distribution and Data Plane Programming. The data demands of the research and education community are evolving faster than ever, and GÉANT's flexible, agile, and long-term approach remains vital.

Supporting the knowledge community

By interconnecting Europe's NRENs and facilitating high-speed links with other global regions, GÉANT connects schools, universities, and the world's largest research projects, enabling scientific discoveries, supporting remote learning, and upskilling communities.

Supporting Ukraine: the GÉANT Community Committee approved the creation of The "Community Action Aid – URAN" collaborative project, as part of immediate and structural community efforts to support Ukrainian colleagues following the Russian invasion of Ukraine.

Returning to live events: the first face-to-face TNC for three years saw 735 participants attend the conference in Trieste, with a further 500+ joining online, together representing 80 countries. 122 speakers delivered 64 presentations and the conference was mentioned in over 1,300 social media posts.

Driving innovation: the GÉANT Innovation programme received 42 proposals (highest so far) and awarded funding to 10 projects. Showcase event held with 150+ attendees to promote the programme, which will run again in 2023.

Demonstrating socio-economic impact: three new IMPACT stories published to highlight the support provided to the research community, with a focus on supercomputing and HPC; redesigned IMPACT website helped to increase visitors by over 40%.

Raising awareness: new websites linked with a common navigation and global search function to consolidate diverse web presences on a common platform, improving the user experience and raising awareness of the breadth of GÉANT activities.

Supporting EuroHPC: ongoing engagement activities to ensure connectivity and support for all EuroHPC sites; working on AAI with all stakeholders.

Thriving Community Programme: 2000+ attendees across 35 member meetings/workshops. The new community website helped to promote the Community Programme and facilitate the Community Award.

Gender Equality: GÉANT's Women in STEM campaign celebrated women's achievements. Videos featuring women from across the GÉANT community were published together with several written interviews as part of the campaign to drive awareness and to encourage girls and women who want to work in STEM subjects to pursue their goals.

Support for EOOSC: 11 of the 25 mandated members of the EOOSC Association are NRENs; 2 of 9 directors from GÉANT community. Ongoing support provided to task forces; leadership of Procurement and Interoperability activities; monthly co-ordination and sharing with the community.

Engaging with Industry: GÉANT's Commercial Partnership Programme grew to 20 commercial partners, 18 of whom attended TNC22.

Renewing global agreements, with three MoUs signed:

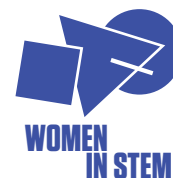
- For the Asia-Pacific—Europe Ring to provide network back-up arrangements between Europe and the Asia-Pacific region.
- For back-up connectivity in the South Atlantic, establishing the Bridging Europe, Africa, and the Americas (BEAA) Collaboration.
- Between RedCLARA, GÉANT, and ASREN, expressing their support for Earth Observation activities.

 **156 FTEs**
600+ contributors
39 partners
43 countries

 **TNC22**
735 event attendees
500 online attendees

 **GÉANT**
9 Work Packages
34 Tasks
84 Deliverables
71 Milestones

 **GÉANT IMPACT**
impact.geant.org
40% increase
in visitors



Optimising the network for all users

The GÉANT network continues to deliver excellent service and extremely high performance for all users, while implementing the largest network refresh of a generation to maintain and strengthen European and international high-speed networking for the research and education community.

Planning for the future: network evolution workshops fed into the network roadmap setting out guidance and constraints for future developments; presented at CTO workshops in September 2021 and November 2022.

Energy monitoring: a baseline for energy usage monitoring has been established to allow for future upgrades and potential changes to be assessed in terms of their impact on energy consumption.

Next-generation network: 20 routes added to production service; full new Western Ring in production from February 2022; new Eastern Europe Inner Ring in service from September 2022. Total of 20,000km of dark fibre or spectrum now lit.

New packet layer: planning completed for packet layer renewal tender.

Managed wavelength: 100Gbps private circuits offered to NRENs on new FlexILS network. The "GÉANT Managed Wavelength Service" will in time completely replace the legacy Lambda service.

GÉANT Services Catalogue: GÉANT services now published to EOSC Marketplace via an API for researchers to select and use.

New services: Argus, TimeMap, and Network eAcademy services entered production. 28 modules added to Network eAcademy to support upskilling.



3 NEW SERVICES

entered production and 28 new modules added to the Network eAcademy



800

**Institutions
23 countries
over €55,000,000
of services in 2022**

Developing services for a rapidly changing world

GÉANT's range of user-focused connectivity, collaboration and identity services remain vitally important to research, education, and an evolving European e-infrastructure. Shorter and more agile development cycles ensure services continue to meet user needs in a rapidly changing environment.

Security outreach: two successful Cyber Security Month (CSM21 and CSM22) campaigns helped raise awareness among the community; two cyber-crisis workshops (31 NRENs attended CLAW) were held to prepare community users for cyber-attacks; and best practices for DDoS Mitigation Strategies were published.

Expanding cloud services: extensive collaboration with user communities such as European Universities Information Systems Association (EUNIS) and ELIXIR, and with global partners including NII/SINET in Japan and Internet2 in the US. Clouds team organised, attended, and presented at over 70 events, as part of efforts to support NRENs that do not yet use GÉANT cloud services or frameworks.

InAcademia: work with national Identity Federations to expand the service's presence in seven countries; milestone of 2 million validations in a calendar year achieved; service growing rapidly and now self-sustaining.

eduGAIN: security team established and integrated; seven new federations joined; new reporting tool launched; 11% growth in identity federations participating.

eduroam: international authentications growing again post-COVID; 6.4 billion authentications recorded in 2022.

eduMEET: eduMEET was the official service for remote online speakers at TNC22.

eduTEAMS: the service continued to reinforce its underlying infrastructure while adding new features such as the new group management user interface (UI) based on OIDC; deployments exceeded targets; underpins federated access to LUMI supercomputing.



**6.4 billion national and international authentications
106 territories
9,500+ institutions**



**80 members
5,000+ institutions**

GN4-3N TO DATE

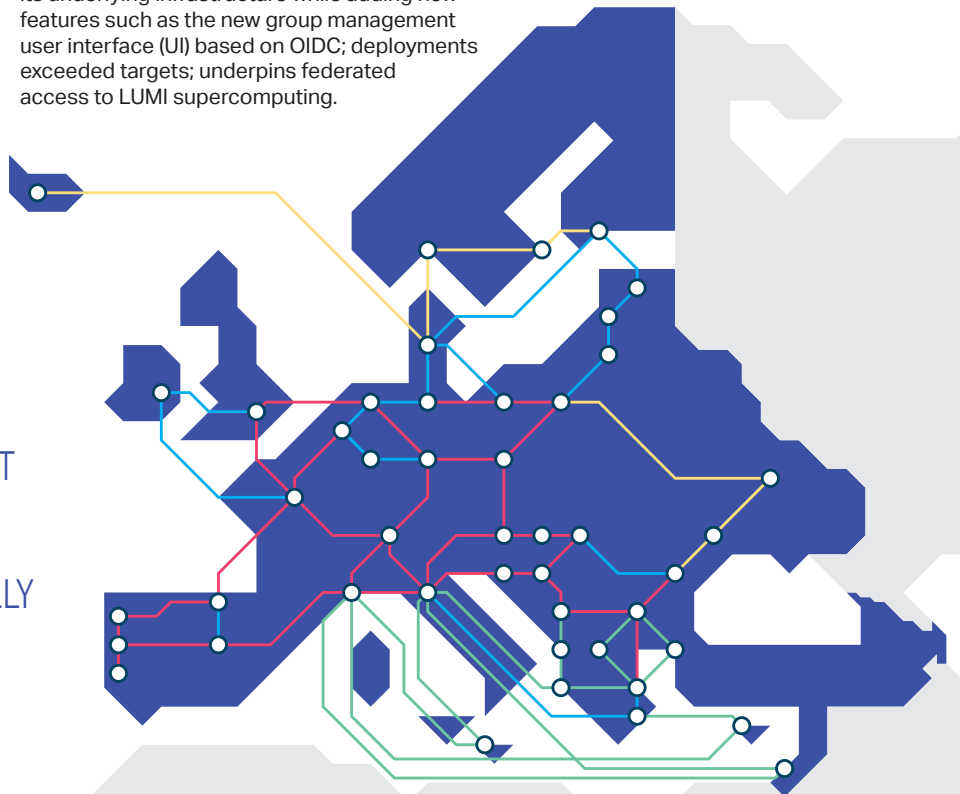
20,000 km

DARK FIBRE AND SPECTRUM LIT

238
PHYSICAL SPANS

42
ROUTES FULLY DEPLOYED

— Fibre
— Spectrum
— Connected Regional Network
— Leased Capacity



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See highlights from past GÉANT projects →

