

What is GÉANT?

GÉANT is the pan-European research and education network that interconnects Europe's National Research and Education Networks (NRENs).

Together, as the GÉANT project, we connect over 50 million users at 10,000 institutions across Europe, supporting research in areas such as energy, the environment, space and medicine. Operating at speeds of up to 500Gbps, and offering unrivalled geographical coverage, GÉANT remains the most advanced research network in the world.

What is the GÉANT Innovation Programme?

As a flagship project of the European Union, GÉANT is key to keeping Europe at the forefront of the global research race.

By investing in the research and development of an advanced portfolio of technologies, the GÉANT Innovation Programme seeks to shape the internet of the future, developing the right services, tools and network capabilities to support tomorrow's researchers.

The programme encompasses all research and innovation activities under the GÉANT project and is represented by a vast community of NRENs and other partners who collaborate to deliver the Joint Research Activities (JRAs).

Harnessing the skills of this huge resource pool the GÉANT Innovation Programme encompasses Open Calls, standards development and Testbeds for disruptive and experimental new uses of the network.



Further Information

Go online to learn more about GÉANT and keep up to date with the latest developments



www.twitter.com/GEANTnews



www.facebook.com/GEANTnetwork



www.youtube.com/GEANTtv

www.geant.net



Also available in this series:



Transforming the way researchers collaborate



Delivering user services across borders



The GÉANT Innovation Programme

Shaping the internet of the future

www.geant.net/innovation



This document has been produced with the financial assistance of the European Union. The contents of this document are the sole responsibility of DANTE and can under no circumstances be regarded as reflecting the position of the European Union.

BR/INN/0514

connect • communicate • collaborate

Network Architectures for Horizon 2020

GÉANT is part of Excellent Science: the e-infrastructures programme with a vital role to ensure Horizon 2020 project participants are able to collaborate, share and access data and test their innovations unimpeded.

The challenges of the "data deluge", the "Internet of Things" and the growth of cloud applications will require radical changes to the core network architectures we see today. This area of research investigates three key areas:

- **Future Network Architectures.** Researching how GÉANT and the NREN community will build their networks in the future. This important research will influence how the telecommunications industry accommodates increasing capacity and emerging services.
- **Network Architectures for Cloud Services.** The way computing power and applications are delivered to users has undergone a step change. This investigates how GÉANT and the NRENs will offer cloud-based services, at scale, to the full range of users.
- **High Speed Mobile Architectures.** Can current network architectures support cloud services, sensor networks, scientific content delivery networks and high-speed mobile networking? This investigates existing and new approaches to network architecture.



Technology Testing for Advanced Applications

The purpose of this research is to deliver the next generation of innovative services. It will investigate prototyping and testing innovative services to enhance and extend the current service portfolio.

By focusing on the needs of specialised applications and disruptive experimentation, particular emphasis will be placed on the specialised needs of large projects and all-encompassing community initiatives (such as cloud service offerings).

Identity and Trust Technologies

Research and education is increasingly virtualised. Identity and trust are crucial for ensuring authorised users can access data and services, and that those services are trustworthy.

Supporting collaboration for research activities whilst guaranteeing users' privacy and security requires careful balancing. The NREN community and the GÉANT project have been amongst the greatest innovators in this area – demonstrated by the success of eduGAIN and eduroam®.

This research focuses on two core areas:

1. **Attributes and Groups.** How to extend the current services provided by Identity Federations (such as eduGAIN) to support managing user groups and user attributes to allow finer-grained identity and trust management
2. **Identity and Trust Technologies.** How to extend the benefits of these services in three ways:
 - Linking the R&E Identity Federations to Commercial provider services to enable greater access to commercial services
 - Investigating the use of physical token systems to enhance user security
 - Working to extend Identity Services beyond the current web-based systems



GÉANT Open Call Research

As part of the GÉANT Innovation Programme, the Open Call projects will bring in fresh ideas and support new uses of the network. GÉANT has invested €3.3 million into 21 independent projects for research into advanced networking technologies.

In support of the Horizon 2020 aims, each project is aligned to one of the GÉANT Joint Research Activities, divided into four themes:

- **Applications and Tools** – supporting advanced research activities and projects.
- **Authentication** – helping support secure end-to-end authentication of systems and people.
- **Network Architecture and Optical Projects** – studying future networking systems.
- **SDN** – exploring Software Defined Networking potential to meet new networking demands.

Find out more: www.geant.net/opencall

GÉANT and Standards

Ensuring interoperability with other networking organisations is essential to effective collaboration at all levels. GÉANT works with a range of standards bodies in network technologies, protocols, security and identity management to help guide the future of networking standards.

Members of the GÉANT project have leadership roles in the OGF (Open Grid Forum) and IETF (Internet Engineering Task Force) standards organisations and make significant contributions to the formation of standards.

GÉANT Testbeds

The objectives of the GÉANT project are to provide a next-generation pan-European network and related services that meets the communications needs of research communities. These require a transport facility for production data and a network environment where experiments can be conducted.

"Testbeds as a Service" will provide two types of Testbed capabilities to support the network research community. The first is a Dynamic Packet Network Testbed Service intended to address higher layer network research, and the second is a Dark Fibre Testbed intended to provide photonic layer long haul facilities for testing novel optical/photonic technologies in the field.

Find out more: www.geant.net/innovation

