GÉANT - Networking and services for research and education

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MARNET/UKIM

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www.geant.org

To support collaboration and development amongst researchers, the dissemination of information & knowledge, and provide access to a portfolio of services and infrastructure resources:

Runs a membership association for Europe's National Research & Education Networks (NRENs)
GÉANT Association

Coordinates and participates in EC-funded projects
Under Horizon 2020 the financial instrument for implementing the Innovation Union, a Europe 2020 flagship initiative aimed at securing Europe's global competitiveness

Operates a pan-European e-infrastructure
GÉANT network

Manages a portfolio of services for research & education
EduX

Organises and runs community events & working groups
TNC, task forces & special interest groups

Membership Association

GÉANT Association supports and represents over 40 NRENs across Europe.

Together they support over 10,000 institutions and 50 million academic users.

Membership Association
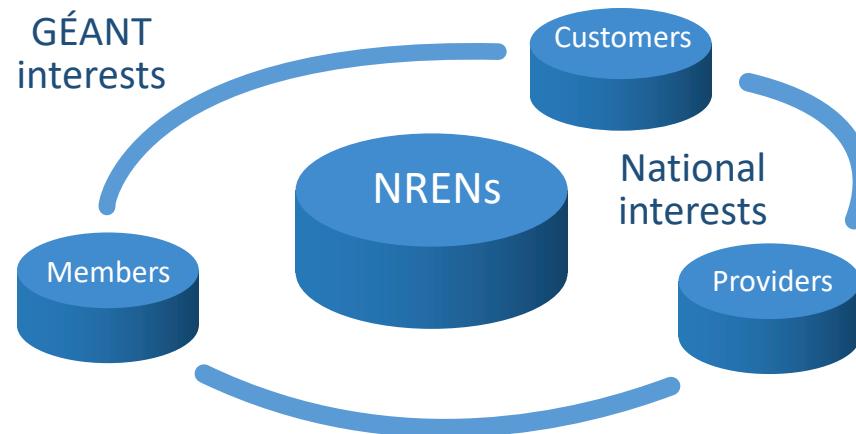
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Governance

GÉANT interests

Customers

NRENs

National interests

Members

Providers

Members	All European NRENs
GÉANT Board	Subset (9) of European NRENs

GÉANT Community committee	Cost Sharing committee	Audit committee	Remuneration committee	GÉANT Programme Planning committee	GÉANT SGA2 Oversight committee

Subset of board + CEO

CEO

GÉANT Executive

GÉANT organisation management team

Projects

GÉANT is a trusted European Commission (EC) partner in many global collaboration projects and initiatives through our special relationship with the European Union.
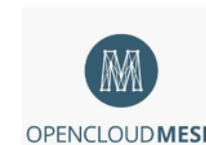
European
e-infrastructure
projects

GÉANT

EUROPEAN
CLOUD INITIATIVE
UNLOCKING THE POWER OF
BIG DATA FOR OPEN SCIENCE

Trust & identity
projects

GÉANT

AARC

Network
projects

Africa
Connect2   CAREN

EaPConnect
Eastern Partnership Connect

EUMED
connect3

Collaborative
projects

OPENCLOUDMESH   UP2U

eInfra Central

GÉANT

Network

The GÉANT network interconnects research, education and innovation communities worldwide, with secure, high-capacity networks.

We design, plan, build and operate the large-scale, high-performance GÉANT network that connects European NRENs to each other and the rest of the world for sharing, accessing and processing the high data volumes generated by research and education communities and for testing innovative technologies and concepts.
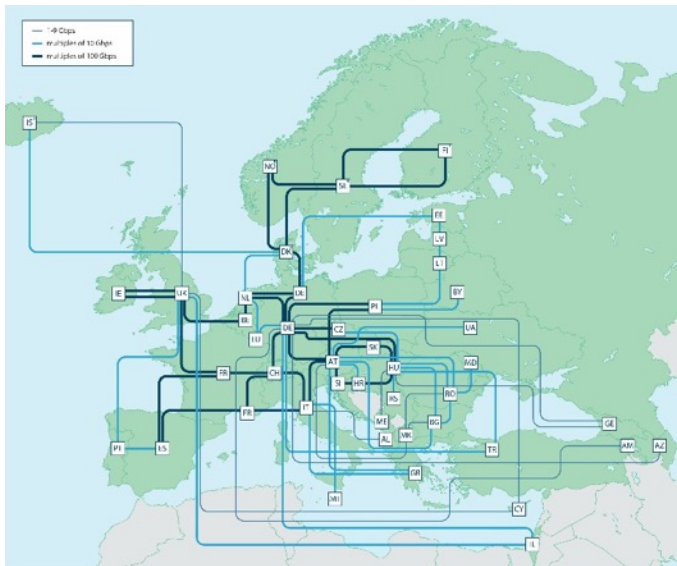
Interconnecting Europe's NREN over a 500Gb highly-resilient pan-European backbone.
NRENs serve 50 million users at 10,000 institutions across Europe.
Network services: IP, Point-to-Point Services, VPN, Testbeds performance monitoring

GÉANT and partner networks enabling user collaboration across the globe

Network

A separate ultra-high-speed internet, only for research & education

Robustness
Over 1,000 terabytes of data are transferred every day via the GÉANT IP backbone.

Total reliability
99.999% average monthly access availability.

"Today it would not be possible to work without the network that GÉANT and the NRENs have provided."
CMS experiment, Large Hadron Collider (LHC)

Efficient operations
The dedicated GÉANT Operations Centre ensures 99% of cases are reported within 15 minutes of any outage being detected, leading to rapid resolution.

Services
A wide range of services including IP and dedicated circuits, testbeds and virtualised resources, authentication and roaming, monitoring and troubleshooting, advisory and support services.
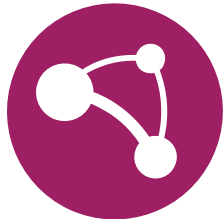
Specialist Services

GÉANT develops the specialist services members need to support researchers, educators and innovators – at national, European and international levels.

GÉANT's portfolio of advanced services covers:

Network centric services

Trust identity and security

Storage and clouds

Real-time communications

Professional services

Network Services

GÉANT operates an advanced, high-performance network supporting Europe's NRENs with cost-effective, highly available, high-capacity services customised for and dedicated to research and education

GÉANT network services

GÉANT IP – Ultra-high performance uncontended IP connectivity at up to 100Gbit/s or multiple 100Gbit/s connections

GÉANT VPN – Layer 3 and Multi-domain VPN services for NRENs and institutions supporting private networking needs

GÉANT Point-to-Point – High performance dedicated connectivity up to 100Gbit/s for the most demanding applications

GÉANT Open – Allows NRENs and approved commercial organisations to exchange connectivity in a highly efficient and flexible manner

Availability Targets
99.999% - *27 seconds downtime/month*
99.99% - *4.5 minutes/month*
99.4%* - *4 hours/month*

Network Performance and Management

Supporting High Performance Networking

perfSONAR
- Network performance monitoring
- Joint venture with Internet2, ESnet and Indiana University
- Over 1650 measurement points deployed globally
- Helping measure and diagnose performance issues for the R&E community

eduPERT
- A world-wide Open Community for Performance Enhancement Response Teams,

- A virtual community covering performance issues for R&E networks

GÉANT CERT Pan-European Computer Security Incidence Response Team coordination and a suite of network security tools (Distributed Denial of Service (DDOS) attack mitigation tools etc.)

GÉANT Testbeds Service

Enabling the development of the next generation of networks and services

Advanced networks and services need to be tested in near real-world environments

Using live networks poses risks to other users

The GÉANT Testbeds Service provides user-defined and user-controlled virtual e-infrastructure environments containing transport circuits, switching/forwarding elements, computational elements and storage

These virtualised networked environments are dynamically created, scheduled, and can span Europe

Trust, Identity & Security

Supporting users and enabling secure access to services

eduroam - secure global roaming access service *250+ million authentications per month* in 101 territories

eduGAIN - interconnects identity federations around the world, simplifying access to content, services and resources ~ 3500 identity providers accessing services

AARC project – collaborating with e-infrastructures, research collaborations, libraries & federations to share policies, architectures, training materials & pilots that avoid re-inventing the authentication & authorisation wheel

REFEDs – supporting identity federations worldwide

Trusted Introducer – services for security and incident response teams

Certificate Service – delivering cost-effective digital certificates.
In partnership with digicert

InAcademia

Online student validation

InAcademia is a service being developed that simply validates to other services that the user is a student or affiliated member of the academic community. Helps service providers offer academic discounts online and in real time.

A lightweight federated identity process with minimal attribute release (essentially a simple yes/no).

Easy for Service Providers to implement.

Removes need for scans of ID cards or primitive e-mail address-based 'authentication'.

Cloud Services

Cloud services can improve the service NRENs and Institutions offer their users

Increased range

Reduced costs (changing from CapEx to RevEx)

Increased flexibility and scalability

The area has huge opportunities but some risks

Supplier lock-in

Data security

Unplanned costs

https://clouds.geant.org/

GÉANT uses its skill and experience to help NRENs understand and navigate this new territory
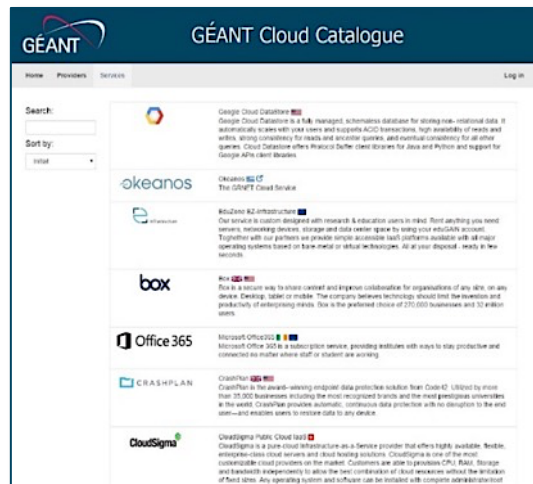
GÉANT Cloud Catalogue

A growing resource for the research and education community, with a structured listing of service providers and cloud services. It provides a quick and easy guide to clarify the capabilities of providers and helps in the procurement of cloud services

28 services from 16 providers

Real-Time Communications Services

Enabling communication and collaboration across the community.

Online communications are crucial to research and education. Students, researchers and institute staff rely on e-learning services and audio and video conferencing to learn and share. This is a rapidly developing area and GÉANT is working to support and foster innovation for the national research and education networking (NREN) organisations and their communities.
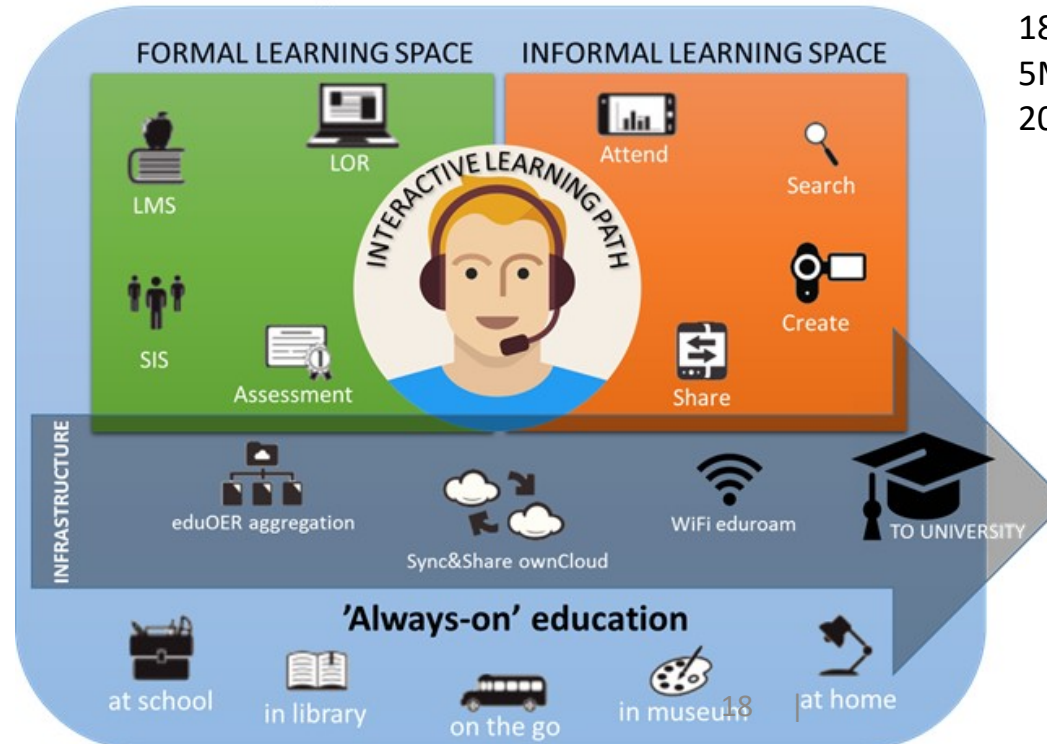
Innovation Action for Supporting Education

"The biggest challenge in first-year college for me was not only the use of new learning technology but the different teaching style."

Filipe Amaro de Sousa, student at ISEP, Portugal

WHAT WE DO

Put a public and private cloud-based infrastructure in place to be used by schools in several pilot countries

Offer a scalable and flexible integrated application toolbox, which supports student-driven, personalised, dynamic learning path creation with social sharing and interactions

Train the learning community for the specific learning context and to facilitate the development of the critical thinking by students and tutoring role of teachers that are essential in an informal learning environment

HOW WE DO THIS

With the collaboration of infrastructure providers, national research and education networks, open and traditional universities and commercial partners

In a secure and trusted manner, making students' privacy our very first priority

By facilitating open, more effective and efficient co-design, co-creation, and use of digital content, tools and services adapted for personalised learning and teaching of high school students preparing for university

UP2U — Up to University

Bridging the gap between secondary schools and higher education & research by better integrating formal and informal learning scenarios and adapting both the technology and the methodology that students will most likely be facing in unis

Up2U ECOSYSTEM

FORMAL LEARNING SPACE — INFORMAL LEARNING SPACE

INTERACTIVE LEARNING PATH

LMS, LOR, SIS, Assessment — Attend, Search, Create, Share

INFRASTRUCTURE: eduOER aggregation, Sync&Share ownCloud, WiFi eduroam — TO UNIVERSITY

'Always-on' education

at school, in library, on the go, in museum, at home

SCOPE:
18 partners
5M€ EC funding
2017-2019

#up2universe   www.up2university.eu

GÉANT

GÉANT – supporting European NRENs

GÉANT Research Engagement (researchengagement@geant.org):

Dedicated single point-of-contact for NRENs

Dedicated single point-of-contact for large international collaborations and organisations

Providing a one-stop-shop include policy and technical consultancy

Welcome to the Case for NRENs portal

A pool of resources to assist national and regional R&E networks (NRENs and RRENs) 'make a case' towards their users, funders and partners.

A toolkit of guidance materials to support in particular new and emerging NRENs.

Find out how to use and contribute to this portal

Community events & clusters

GÉANT invests in the research and development of network architectures, technologies and paradigms to develop into the services, processes, tools and network capabilities of tomorrow.

TNC

Community Conference

Special Interest Groups and Task Forces

Research Programmes

Service Development

GÉANT

Special Interest Groups & Task Forces

Thank you

Any questions?

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