



# CONNECT

THE MAGAZINE FROM THE GÉANT COMMUNITY | ISSUE 15 MAY 2014

## EARTH OBSERVATION

EUMETSAT AND GÉANT  
ENSURING DELIVERY  
OF CRITICAL DATA

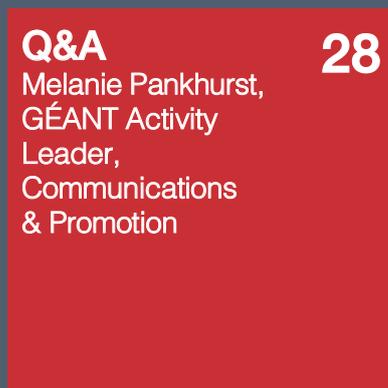
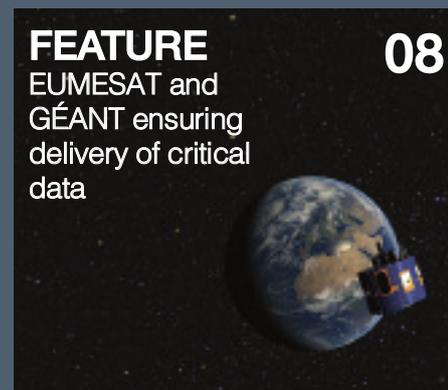


**TNC2014 SPECIAL:**  
16 PAGE SECTION ON  
GÉANT PARTICIPATION

**GLOBAL CONNECTORS:**  
INTERNET HALL OF FAME  
HAILS TWO GÉANT  
LEADERS

**EXPLORERS CLUB:**  
ELITE SCIENTISTS AND  
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GÉANT

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CONNECT is the quarterly magazine from the GÉANT community; highlighting key areas of interest, updates on the project and its vital work supporting European research and education. We give insights into the users who depend on the network, and the community that makes GÉANT what it is. We welcome feedback at [connect@geant.net](mailto:connect@geant.net)

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# WELCOME FROM THE EDITORS



**T**he growth in GÉANT's usage by pan-European projects continues apace. Copernicus (page 7), the world's most comprehensive Earth Observation programme and EUMETSAT (page 9), a global satellite agency delivering weather, climate and environmental data to users worldwide – are both vitally important projects set to benefit from GÉANT's high-capacity network. Find out just how significant the world of Earth Observation is to society (not to mention why the EU is investing almost €12 billion in space technology over the next seven years).

Yet more awards to announce this year with two GÉANT project participants inducted into the Internet Hall of Fame (page 2). They join some of the great internet developers and visionaries of our time, including Sir Tim Berners-Lee (inventor of the World Wide Web) and former US vice president Al Gore.

On page 10, learn about MD-Paedigree, a pioneering project that will help paediatric doctors make better decisions using big data and incredible simulations created from MRI scans.

For our readers involved in research networking, you'll find a guide to GÉANT's participation at this year's TERENA Networking Conference on pages 14 to 27. Here we reveal our new Open Call partners, who will be publicly announced at Europe's largest and most prestigious European networking conference - in May.

We have insights from DANTE Head of Communications, Melanie

Pankhurst on page 28, who explains the challenges of communicating this vast and complex project and some success stories from that outreach: including the NASA sonification story, which led to the feature on page 4.

On page 33 you'll find useful advice for anyone looking to reduce their ICT CO2 emissions. That should be all of us right?

Finally, a sad farewell to Karel Viestsch, TERENA's Secretary General who passed away earlier this year and is greatly missed. You can read more about the significant contribution he made to the GÉANT project on page 44.

There is of course, so much more to read in this issue than we can mention here. So without further ado, we'd like to give a quick thanks to the growing number of you getting in touch to share your stories. Please do keep it up, we love hearing from you! Write to us at [connect@geant.net](mailto:connect@geant.net)

**Editors**  
Paul Maurice  
& Tamsin  
Henderson

# GÉANT PROJECT PARTICIPANTS INDUCTED INTO INTERNET HALL OF FAME 2014

## CELEBRATING THE VISIONARIES AND INNOVATORS WHO WERE INSTRUMENTAL IN SHAPING TODAY'S INTERNET AND EXPANDING ITS GLOBAL CONNECTIVITY



### INTERNET HALL OF FAME

DANTE co-founder, Dai Davies and SURFnet CTO Erik Huizer have joined the elite ranks of notable individuals who have been inducted into the Internet Hall of Fame.

Both Dai and Erik were named Global Connectors, a category which recognises and celebrates individuals from around the world who have made major contributions to the growth, connectivity, and use of the internet, either on a global scale or within a specific region or community. Dai was responsible for the original development of the pan-European research internet from 1991, which has grown beyond recognition to become

the GÉANT network, we know and see today. Said Davies:

"I am delighted to be recognised into the Internet Hall of Fame, but of course credit is due to the many hundreds of highly qualified, independent-minded and foresighted people who have worked tirelessly over the years to create what we see today. We should all be proud of this incredible achievement. The opportunities for improving lives that high-speed networks provide to science are clear, and already many societal areas are starting to see real benefit, from healthcare to climate change, disaster recovery, food security and in education and the arts. GÉANT is providing opportunities we could have only dreamed of ten years ago.

In particular, I would like to extend my thanks to DANTE co-founder, Howard Davies, who was instrumental in overcoming many of the hurdles and challenges faced throughout the early years, and he shares this award jointly with me."

**Words**  
Tamsin  
Henderson

**Pictures**  
Dai Davies  
speaking at  
the awards  
ceremony, and  
Erik Huizer  
(inset)

## A LEADER IN GLOBAL INTERNET DEVELOPMENT

Huizer has contributed to the internet's ongoing development in various leading international positions. He served as area director of the Internet Engineering Task Force, the Internet standardisation body responsible for the development and standardisation of internet applications such as the WWW. He has also been a member of the Internet Architecture Board, which draws up general guidelines on Internet architecture, and chairman of the Internet Research Task Force, an organisation dedicated to long-term research about the internet. He currently serves as a board member at the Public Interest Registry (.org) and a member of the ICANN Internet Governance Strategy panel.



“The 2014 Internet Hall of Fame inductees include extraordinary individuals who have helped shape the global internet,” noted Internet Society CEO Kathy Brown. “This historic assembly of internet trailblazers, innovators, and thought-leaders represent many different countries and backgrounds, each with an inspiring story to share. We applaud their achievements and determination to push the boundaries of technological and social innovation to connect the world.”

More details on the 2014 Internet Hall of Fame inductees, including their biographies and photos, can be found at [www.internethalloffame.org](http://www.internethalloffame.org)

Look for the next issue of CONNECT, which will feature a more in-depth Q&A with recent Internet Hall of Fame awardees.

## ABOUT THE INTERNET HALL OF FAME

The Internet Hall of Fame ([www.internethalloffame.org](http://www.internethalloffame.org)) is a recognition program and virtual museum that celebrates the living history of the Internet and the individuals whose extraordinary contributions have made the Internet, its worldwide availability and use, and its transformative nature possible. The Internet Hall of Fame was launched by the Internet Society in 2012.

## ABOUT THE INTERNET SOCIETY

The Internet Society ([www.internetsociety.org](http://www.internetsociety.org)) is the trusted independent source for Internet information and thought leadership from around the world. With its principled vision and substantial technological foundation, the Internet Society promotes open dialogue on Internet policy, technology, and future development among users, companies, governments, and other organizations. Working with its members and Chapters around the world, the Internet Society enables the continued evolution and growth of the Internet for everyone.



# GÉANT JOINS WORLD'S ELITE SCIENTISTS AND EXPLORERS AT PRESTIGIOUS EXPLORERS CLUB ANNUAL DINNER

Pioneering astronaut Buzz Aldrin, celebrated oceanographer Walter Munk, visionary entrepreneur Elon Musk, and world-renowned planetary scientist Maria Zuber were among the many illustrious guests at the 110th Explorers Club Annual Dinner (ECAD) earlier this year, held at the Waldorf Astoria, New York.

Alongside them, speaker invitee Domenico Vicinanza, Network Services Product Manager at GÉANT, explained the value of high-speed networks to scientific discovery, and played the 'Sounds of Space', a musical duet based on NASA Voyager spacecraft data, created using data sonification techniques reliant on the GÉANT network. Anyone who missed this stratospheric story of the NASA sonification can listen to the duet at <https://soundcloud.com/geant-sounds>.



## ILLUSTRIOUS AUDIENCE DISCOVER GÉANT

The 1200 strong audience of prominent scientists, courageous explorers and royalty were treated to the soundtrack during dinner, which featured an exotic, ‘explorer themed’ menu including maggots, goat-eyeball martinis and deep-fried tarantulas.

The speech and music were streamed live during the event, which included a video from Stephen Hawking, the world’s most brilliant theoretical physicist, as the events keynote speaker.

Said Domenico Vicinanza: “The Explorers Club is a globally recognised institution that promotes the scientific exploration of land, sea, air, and space by supporting research and education. With the same goal and aspiration to promote the advancement of scientific discovery, the Explorers Club provides the perfect platform to further increase visibility of GÉANT and the important projects it supports.”

Guests included The King of Morocco and the Crown Prince of Bhutan.

## THE EXPLORERS CLUB

The Explorers Club is a professional society dedicated to the advancement of field research. Its members are responsible for an illustrious series of famous firsts: first to the North Pole, first to the South Pole, first to the summit of Mount Everest, first to the deepest point in the ocean, and even the first humans to land on the Moon, among other feats of perseverance and courage.

**Words**  
Tamsin Henderson

**Pictures**  
Clockwise from top left: Sharing a joke with Walter Munk, one of the world’s greatest living oceanographers who received a standing ovation during dinner; explaining role of GÉANT and high speed networks; Domenico and Brian Greene, world-renowned astrophysicist and best-selling author; exotic buffet!

# IT'S NOW EASIER THAN EVER TO COLLABORATE USING GÉANT SERVICES!

## SECOND PHASE OF EDUGAIN INTEGRATION COMPLETE

eduGAIN has facilitated federated access to the GÉANT project intranet, meaning 300 participants and parts of the wider community can now access using their home identities'. This is a good example of how eduGAIN can help with federated access.

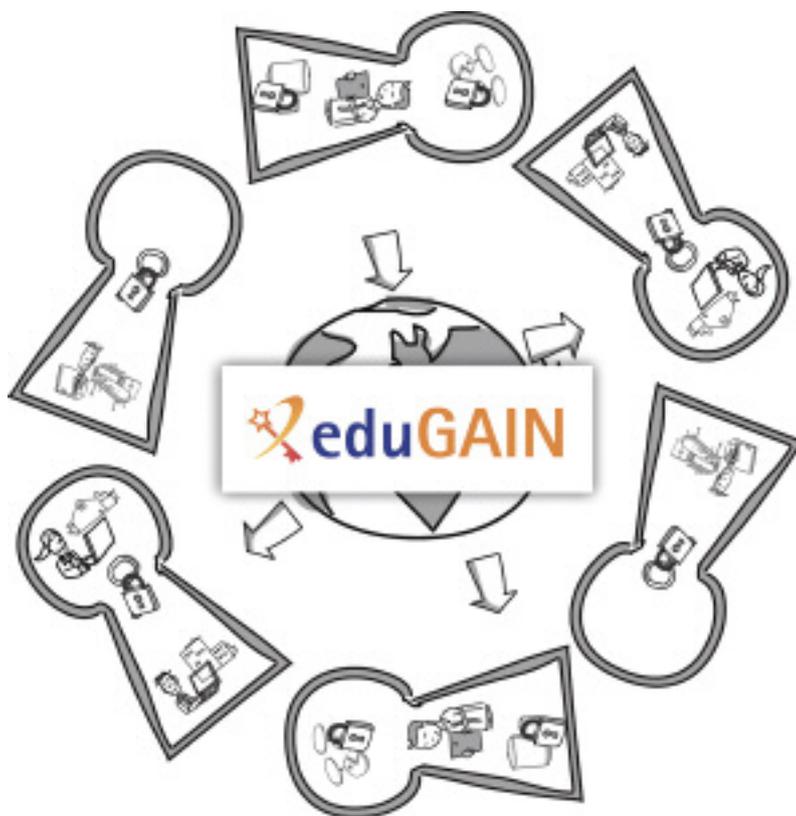
The GÉANT community can log into the GÉANT intranet using their federated identity, which means one simple set of credentials and improved security. Having single sign-on (SSO) not only enhances the user experience but streamlines management from the IT side – making it a much more efficient, convenient solution for everyone involved in the project. It is hoped this will encourage more users to actively collaborate using this accessible platform.

Anand Patil, CIO of DANTE and sponsor of the integration project said:

“The community has been asking for ‘eduGAINising’ the GÉANT Intranet for some time now and it has been a European Commission recommendation that all GÉANT services become federated. Finally, this dream is now a reality. It not only benefits the users in terms of Single Sign-On but also reduces the GÉANT IT overheads to manage user accounts. We are planning to federate more GÉANT services in the near future.”

Ann Harding, GÉANT SA5 Activity Leader for Multi-Domain Network Services said:

“I am very pleased to see eduGAIN being able to help the GÉANT project participants in this way. This was an excellent case of know-how from the wider application services and federated identity community coming together with DANTE IT to enable all participants in GÉANT get the benefits of federated identity.



We in GÉANT are not so very different to many other research communities in our authentication and authorisation requirements, so the experience in this project can benefit our ongoing work with research communities. And of course I'm personally very happy to be able to have one less log-in to manage! “

Project participants can find more information in the **GÉANT Intranet and eduGAIN User Guide** for details on accessing the Intranet via eduGAIN and FAQs, including who to contact in case of any questions or issues.

### Words

Mandeep Saini,  
Senior Software  
Engineer,  
DANTE

eduGAIN is the GÉANT inter-federation service simplifying access to content, services and resources for the global research and education community. It aims to enable the trustworthy exchange of information related to identity, authentication and authorisation between identity federations.

[eduGAIN.org](http://eduGAIN.org)

# GÉANT SUPPORTING WORLD'S BIGGEST EARTH OBSERVATION PROGRAMME

**With the European Union investing almost €12 billion in space technology over the next seven years, it's clear space is high on the political agenda.**

Copernicus is the EU's Earth observation programme and will be the world's biggest ever effort to characterise our planet. Once all the satellites have been launched, it will produce around eight terabytes of data every day, as it details the state of Earth's land surface, atmosphere and oceans.

GÉANT is now working on a trial with Copernicus to ensure the data is accessible to the worldwide research and education community, with full production planned for the end of the year.

Via a connection of the gateway to the COPERNICUS data in Frankfurt to DFN PoP (the German National Research and Education Network) which in turn connects to GÉANT,

researchers all over the world will gain access to the Copernicus data sets with unrivalled bandwidth and network performance.

These data sets will be generated from applications such as monitoring sea ice zones and the Arctic environment; surveillance of oil spills and ship detection; mapping forest, water and sustainable agriculture; supporting humanitarian aid in crisis situations and climate monitoring.

Open dissemination of Copernicus information will help citizens, researchers and policy makers to integrate an environmental dimension into their decision-making procedures, multiplying the benefits for society today and tomorrow.

As well as supporting the space industry itself, the programme is likely to impact other economic sectors such as transport, oil and gas, insurance and agriculture. Studies show that it is likely to generate around €30 billion and create up to 50,000 jobs in Europe by 2030.

In the future, GÉANT and the European Space Agency (ESA), which is developing the space observation structure, will cooperate on integration with eduGAIN. This will enable federated identity management to manage and improve access to the data, making it even easier for people to use the information.

**Words**  
Tamsin  
Henderson



# EUMETSAT AND GÉANT: ENSURING DELIVERY OF CRITICAL DATA



**Observing the atmosphere, ocean and land surfaces is becoming ever more important for decision-making at domestic and international level, and the data generated by earth observation projects that enables this decision-making is rapidly increasing. GÉANT responded to EUMETSAT needs to support the distribution of this data.**

EUMETSAT (the European Organisation for the Exploitation of Meteorological Satellites) is a global operational satellite agency at the heart of Europe. Its purpose is to gather accurate and reliable satellite data on weather, climate and the environment 24 hours a day, 365 days a year and to deliver that data to National Meteorological Services of EUMETSAT Member and Cooperating States in Europe, to international partners, and to users world-wide.

## INCREASINGLY VITAL TO SOCIETY

Weather forecasting has become ever more important, helping society to detect, prepare and deal with extreme weather. EUMETSAT data supports decision-making at all levels of society, and is critical to governments, air travel safety, shipping and road traffic, as well as to areas such as farming, construction and other industries.

Furthermore, satellite observations are highly relevant to climate monitoring and together with other organisations such as Copernicus are helping to address this global challenge.

EUMETSAT also cooperates closely with the National Oceanographic and Atmospheric Administration (NOAA) in the USA, and is working towards close cooperation with satellite operators of China, India, Japan, Korea and Russia to coordinate missions, exchange data and expertise, and facilitate distribution of EUMETSAT data worldwide.

## PART OF GLOBAL EARTH OBSERVATION

EUMETCast is EUMETSAT's primary dissemination mechanism for the near real-time delivery of satellite data and products. Established in 2004, it enables data to be distributed to multiple partners or groups of partners at once. With over 4000 registered reception stations, it is highly scalable and is based on standard Digital Video Broadcast technology, using commercial telecommunication geostationary satellites to multi-cast files to a wide user community.

Furthermore, EUMETCast is EUMETSAT's contribution to GEONETCast – a global network of satellite-based data dissemination systems providing environmental data to a worldwide user community. GEONETCast is a milestone in the Global Earth Observation System of Systems (GEOSS), coordinated by the intergovernmental Group on Earth Observation (GEO), and aims to strengthen international cooperation on global earth observation.

Due to the increasingly vital nature of this data transmission, EUMETSAT utilises terrestrial Wide Area Network (WAN) links for data acquisition from EUMETSAT ground stations and the exchange of data with worldwide distributed bi-lateral partners. GÉANT and Europe's NRENs are complementing this connectivity.

*CONNECT spoke with Maria Minaricova of GÉANT's pan-European user liaison team, to learn more about this exciting development.*

### Words

Paul Maurice interviewed Maria Minaricova (left), of GÉANT's pan-European user liaison team

### Image

© EUMETSAT 2014

## WHAT WILL GÉANT PROVIDE TO EUMETSAT?

GÉANT will provide a flexible and scalable service that will facilitate a single point of contact interface for the network setup and monitoring, as well as support connectivity test and validation activities across the GÉANT and NREN networks for the distribution of EUMETSAT's terrestrial multicast data dissemination to EUMETSAT Member States and partners. The service will start with initial capabilities in a core.network but offers a number of options to allow expansion of the current setup geographically and to provide additional monitoring capabilities.

DANTE will act as the service provider to EUMETSAT for all network related aspects and will coordinate such across national domains to achieve the contractual agreed service objectives, namely the enabling of multicast capabilities between the EUMETSAT HQ interface to DFN (the German NREN) and the Site Access Points of each NREN participating in the project; network service monitoring and reporting; network operations and service management as well as test and validation support. In addition, DANTE will support EUMETSAT to enable multicast network connectivity to the Korean Meteorological Agency in South Korea, and the National Oceanographic and Atmospheric Agency (NOAA) in the USA.

**“We look forward to developing our relationship with GÉANT, and the DANTE provided services will significantly support us to serve our users worldwide. In particular, the possibility for DANTE to act as contractual Single-Point of Contact and using the existing European Infrastructure is especially exciting.”**

Lothar Wolf, Competence Area Manager for Data Services at EUMETSAT

## WHY DID EUMETSAT SELECT GÉANT, AND WHAT DO THEY SEE AS THE KEY BENEFITS?

EUMETSAT and GÉANT both have extensive expertise in working with large and distributed user communities and of delivering world-class services to their respective constituencies. By responding to EUMETSAT needs the GÉANT community, strategy, expertise, experience and local knowledge can be shared to support and further develop the delivery of GÉANT network services. By engaging with DANTE, EUMETSAT will benefit from established links through the GÉANT network to the European NREN infrastructures that connect major science experiments distributed across Europe. This will allow EUMETSAT to capitalise on such existing European infrastructure and service areas in a cost efficient way.

Moreover, GÉANT's established position as a long-term pan-European infrastructure and an integral part of the EU's research strategy is an ideal partner for an organization seeking long-term stability.

## WHAT IS THE TIMELINE?

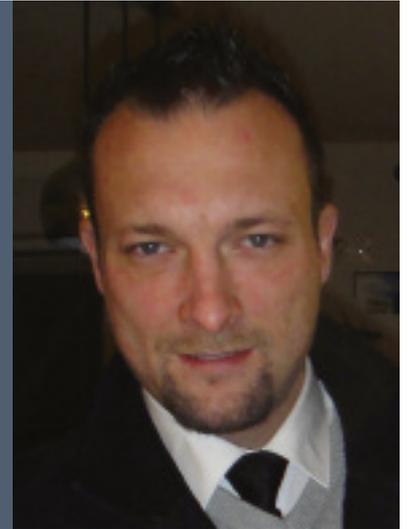
The project implementation phase started on 22 April and the initial service provision will start in January 2015 and continue for a period of two years. However pending future assessment EUMETSAT plans to consider longer term contractual arrangements.

The societal benefit of EUMETSAT's work cannot be underestimated, and GÉANT – as part of Europe's vital e-infrastructure – is extremely proud to be supporting this agency and its partners.

# THE FUTURE OF HEALTHCARE IS IN BIG DATA

## Q&A WITH DAVID MANSET, INFOSTRUCTURE LEADER, MD-PAEDIGREE

David Manset is CEO of gnúbila France (<http://www.gnubila.fr>). Over the last 10 years, he has contributed to European and international initiatives focusing on e-health and biomedical research. CONNECT caught up with David to find out more about the ground-breaking MD-Paedigree project.



MD-Paedgree, a four-year European Commission funded ICT project to help fight childhood obesity-related cardiovascular and other child diseases.

It has the ambitious aim to develop a Europe-wide big data system for paediatric research, which will provide decision support to medical professionals when treating young patients. (MD [www.md-paedegree.eu](http://www.md-paedegree.eu))

## HOW DID THE PROJECT COME ABOUT?

MD-Paedgree capitalises on several EC projects, in particular Health-e-Child and Sim-e-Child. Both were very successful not only in demonstrating the visibility of the infrastructure but also in pioneering the concepts and business models we are building on today.

After a one and a half year break, we were mandated by the hospital chain Ospedale Pediatrico Bambino Gesù in Italy to set up a big data infrastructure backbone to do translational research. This enabled us to set up the first prototype, accessing and experimenting with the health information systems within these hospitals.

We were then able to go to the EC with the proposal for MD, much more ambitious in scope, opening up to seven hospitals Europe-wide and internationally (one in the US). Today we have 22 partners and 7 hospitals targeting 4 disease areas, and we are aiming at expanding it to others.

## WHAT CAN THE INFRASTRUCTURE DO?

We can develop a full model of the heart not just anatomically but physiologically. We provide tools to simulate heart conditions, better understand disease evolution and eventually make decisions on treatments and operations.

Expanding the scope to juvenile arthritis – we can model bones and the impact of treatments. We're also aiming to develop a musculoskeletal patient specific model to aid new developments for neurological disorders.

## HOW IS GÉANT INVOLVED?

Firstly, with Health-e-Child we encouraged participating hospitals to obtain a GÉANT connection. Our strategy involves installing big data nodes within the hospital premises, so that the data stays local.

This node has one foot in the main firewall and one foot outside. Inside is connected to the health information system with a connector doing the data extraction. Once this is done the data is uploaded to the other side outside the firewall where it becomes part of the big data federation, so all users connecting to MD can interact with the data being shared by the participating hospitals

**Words**  
**Tamsin**  
**Henderson**  
**interviewed**  
**David Manset**

## EDUGAIN AND EDUROAM

TGÉANT provides the essential high bandwidth needed to run complex calculations and move results sets around. We have also integrated our security with eduGAIN. Our system is now compatible with federation of identity providers so all users can connect and authenticate into the platform using their eduroam credentials. They still have to apply for accessing data, but this now opens the market to new users by making it easier for people to connect to the solution.

eduroam is basically making our users life much simpler because we don't have to handle the complexity of digital identities. At the user end all they have to do is use their regular eduroam credentials. It's a win-win situation.

This is important because our goal is not only to develop a research platform but a production environment - a real application. We are developing two major accesses and environments in this respect.

One is dedicated to research, the place where we collect real data on patients enrolled in the four disease studies. The other is a production environment, so a subset of applications will be made available over a much larger dataset. By negotiating with hospitals on a case by case basis, we already have more than 50k patients documented in the system.

This will make brand new research applications available very quickly to physicians, clinical researchers and PhD students – anyone interested (and authorised) in accessing this type of data and applications for curiosity and research.

## WHAT WILL THIS MEAN FOR HEALTHCARE PROFESSIONALS?

You gain access to a large population sharing similar conditions and you can compare every single piece of data in the system, thanks to big data principles.

## FOR INSTANCE?

Imagine you are treating a child in Rome. You can compare them with those already treated in the UK first instance. If there were any specific clinical conditions, you can get in touch with the physician in charge. Exchange knowledge with other health professionals involved. You can check how they recovered.

If you're a researcher you can look for patterns of clinical conditions describing particular pathologies. Source data is integrated, semantically enriched and made compatible and understandable.

The only drawback is that healthcare professionals are not allowed to make any decision for treating the patient based solely on this. However, they can use this it as an additional source of information, in the same way for instance they would use google...

## HOW WILL THEY DO THIS?

Similarity research allows you to search for patients like "mine". You can look for specific patterns using cluster-based similarity searches. Or you could use the knowledge discovery interface to investigate by statistics any such patterns from the data. Potentially you could eventually discover new patterns of clinical conditions.

## WHAT OTHER BENEFITS CAN WE EXPECT?

In cardiomyopathy you could open the MRI scan of a patient's heart and apply models segmenting the chambers of the heart and obtain in a few seconds a full anatomy and physical references of the heart to simulate its function. From this you can extract meaningful measurements that are precious as to when to operate.

Thanks to these new models we are able to non-invasively support decision making. We will no longer need to practically validate models on comparable organisms like animals.

## YOU WON AN AWARD RECENTLY?

Yes, we were thrilled to be selected as one of 200 exhibitors at ICT2013. Competition is always fierce – every year they receive around 1500 applications – not just from e-health, but all scientific fields: from satellite communications to driverless cars. So you can imagine how we felt when we won 'Best Exhibit Award' overall. It was a great opportunity to raise our visibility.

## NEXT STEPS FOR MD-PAEDIGREE?

By the time you read this, we will have proudly shown our work to the EC at our first annual review. All going well we will have proved how we already have a system that can be demonstrated and is eduGAIN compatible.

Our next major milestone is opening the system to our consortium users. The first stage will take place next year, opening access to the hospitals and all related departments and groups with training.

The second stage will be opening to the community at large. This will be done using a freemium business model where users can register for free or sign up to premium for professional access.



# **TNC SHOW SPECIAL: GÉANT INNOVATION IN ACTION**

*As the largest and most prestigious European research networking conference, the annual TERENA Networking Conference (TNC) offers GÉANT a great opportunity to showcase its activities and touch base with the research and education networking community.*



At TNC2014 GÉANT will again play a significant role, with the emphasis on Innovation in Action, and contributing to the event with multiple papers delivered by 16 speakers, including for the first time representatives from GÉANT Open Call project partners.

These will cover topics on networking architecture, testbed-as-a-service, monitoring, advanced networking, flexgrid, SDN virtual networks and applications, mobility and mobile security, eduroam, simplifying federation deployment, fighting network threats, cloud services, and lots more.

GÉANT will also have an exhibition booth, featuring eduCONF, GÉANT Open and eduPERT, as well as contribute to a BoF on GÉANT testbed services, technology demonstrations, posters and lightning talks.

Over the following pages in our TNC section we look at some of these areas in more detail, and on pages 26 and 27 provide a full listing of all GÉANT-related presentations, workshops and meetings for your easy reference.

Enjoy the show!

# GÉANT OPEN CALL

## PARTNERING WITH THE WORLD'S TOP INNOVATORS

### Words

Diana Cresti (GARR) and Karl Meyer (DANTE)

The GÉANT project has long been at the forefront of research and innovation in the fields of networking and networked services, serving the most technically aware users and meeting the most demanding requirements for connectivity and collaboration services.

To leverage the exceptional talent in the community and to foster closer links with industry, GÉANT launched its Open Call research program in 2013, investing €3.3million into innovative research that could help shape the networks of the future.

In addition to the funding, GÉANT offers innovators access to the world's most powerful production-ready experimental platform. The 21 new Open Call projects bring in leading experts from universities, research labs and industry to work together with the GÉANT development teams. This synergy between cutting-edge research and a powerful and sophisticated infrastructure offers the teams unrivalled access and provides GÉANT with fresh insights and expertise.

Collaboration with research teams allows GÉANT and the NRENs to partner with the community to foster innovation in a wide range of fields from services supporting Big Data applications to extremely low latency transmission for the performing arts, to clean-slate designs for the next generation of networks which revisit the most fundamental assumptions on network architectures such as TCP/IP.

**“Open Calls provide the research teams in the project with the motivation and the inspiration to work on delivering advanced network capabilities for specialised applications. Furthermore, we're able to sit together with a number of acknowledged researchers and innovate with them, evolve concepts, evolve technologies and standards.”**

Afrodite Sevasti, GÉANT

**“We are glad that GÉANT is supporting this research. GÉANT also offers a rich community of experts in the area of digital identity, authentication, privacy and security, so we could use this community to share our ideas with and to get feedback; we can also use the community to try and pilot our ideas with real users.”**

Bob Huselbosch, WoT4LoA

The Open Call Research is divided into four families:

- Applications and Tools
- Authentication
- Network Architecture and Optical Projects
- Software Defined Networking

Each theme is supported by resources in the GÉANT project to ensure the teams get the most out of the collaboration and results are shared throughout the GÉANT project participants.

Over the next 3 pages we give an overview of each of these four families, and on pages 18-19 take a more detailed look at a project from each family.

## APPLICATIONS AND TOOLS

The power of the GÉANT and NREN network comes from its practical uses, from the applications researchers run over it. By developing innovative uses for the network, barriers to research can be broken down and collaboration across Europe is further improved. The projects in this family are building services that enhance the ability of the GÉANT network in supporting advanced research activities in areas such as secure content delivery for Big Data and bandwidth and video on demand.

- **ARES: Advanced Networking for EU genomic research**  
a system based on NetServ router architecture and OpenStack cloud software
- **GEOVDS: Cross-site Evaluation of an OpenFlow-assisted Video-on-Demand Distribution Service**  
running across multiple sites to reduce the overall network utilisation while improving the Quality-of-Experience for end users
- **eMusic: Using GÉANT dynamic circuits to support remote collaboration in musical education and eCulture**  
using the GÉANT bandwidth on demand (BoD) service to support remote education and collaboration in music (eLearning) and remote access to cultural performances (eCulture);
- **NSI-CONTEST: Network Service Interface Conformance Test Suite**  
aiding developers in validating NSI Agents for BoD under various conditions of load and position in the service chain

“We are delighted that the Italian participation in these projects has been so successful, demonstrating the high level of innovation and competence of Italian projects in many fields – not just those specific to networking, but also those relating to molecular biology and real time music performance between remote sites. This demonstrates, in addition to the competence of Italian researchers, the value of a European-level collaboration between research networks, which can also, with the support of the EC, invest in extremely innovative activities for new generation services.”

Mauro Campanella, GARR

## AUTHENTICATION

With ever greater use being made of distributed applications and systems, it is vital to nurture the evolution of services that make up the fabric of trust between users, identity providers and service providers. Secure identity and authentication, coupled with enhancements in usability for those who need to access resources, is essential to get maximum value from distributed systems.

This complex universe of trust and identity management is evolving rapidly around several core concepts: how can individuals have more control in managing their identity? How can identities be made more secure? How can we optimise the process of identity verification, to enhance access and usability of services whilst maintaining a high level of security? These questions are addressed by three projects in this family:

- **GÉANT-TrustBroker: New Federation Services and Protocols for Dynamically Building Trust in the R&E Community**  
allow users to initiate first-time contact between their identity providers and service providers, brokering trust operations in a fully automated manner
- **HEXAA: Higher Education External Attribute Authorities**  
AA services have been proposed by several research communities to better scale secure identity verification for growing numbers of users
- **WoT4LoA: Web of Trust based Level of Assurance enhancement**  
develop a protocol to implement a PGP web-of-trust model

Another important area is the extension and evolution of current identity federation technologies and the world-class eduroam service, and the integration of these services with Cloud technologies. Three projects are working in this area:

- **MEAL: Multidomain eduroam® across LTE**  
extending eduroam access to publicly-accessible commercial mobile networks
- **SENSE: Secure Enterprise Networks finally Simple and Easy**  
improving the user experience in the initial eduroam setup
- **CLASSe: Cloud-ABFAB Federation Services in eduroam**  
integrating the Moonshot identity management service into the OpenStack cloud software

“There are four different authentication projects, and they are very interesting to us, and we want to have synergies between them and ourselves, and we want to participate in the larger GÉANT community.”

David Chadwick, CLASSe

## NETWORK ARCHITECTURE AND OPTICAL PROJECTS

The challenges faced by the network from the Data Deluge are huge and potentially incredibly disruptive. The volume of data being generated in the latest research projects is many orders of magnitude greater than even 5 years ago. Existing network paradigms may not be able to cope with the anticipated changes to data transfer. Looking forward towards future generations of networking technologies, these projects study future networking systems in order to help NRENS understand the issues and plan solutions.

The world-class GÉANT network is the ideal environment for testing and building the future internet, starting with the hardware itself (fibre and routing/switching equipment) and the basic network architecture. Its dark fibre testbed provides record-shattering speeds in the order of Terabits per second over five long haul routes throughout Europe.

Three projects are working directly with the fibre capabilities, both for scientific purposes and in the context of the evolution of optical transmissions, from increasing spectral efficiency on single superchannels, to exploring new wavelengths (e.g. Alien Wavelengths) that allow operators to introduce new features and technology on the existing optical transport infrastructure

- **ICOF: International Clock Comparisons via Optical Fiber**

a high profile scientific project performing a state-of-the-art atomic clock comparison using GÉANT long haul dark fibre

- **COFFEE: Coherent Optical system Field-trial For spectral Efficiency Enhancement**

enhancing spectral efficiency over high capacity superchannels, using techniques such as Time-Frequency Packing

- **MOMoT: Multi-Domain Optical Modelling Tool**

investigating the potential of providing an Alien Wavelength service in the GÉANT network

Two projects are working on network architecture, in the areas of flexible optical networks and clean-slate design for Future Internet:

- **REACTION: Research and Experimental Assessment of Control plane architectures for In-Operation flexgrid Network re-optimization**

routing and spectral allocation algorithms enabling software-controlled super-channel transmission

- **IRINA: Investigating Recursive InterNetwork Architecture as the next generation GÉANT and NREN network architecture**

the RINA protocol could entirely supplant the increasingly outdated TCP/IP

“We want to see if we can do eCulture stuff, broadcast and take to different places events which people cannot attend because [the event] might be in London and they live in Prague. To do this of course we need the network. For LoLa, we already used GÉANT since the very beginning of the project itself; on the other hand, with 4KTV we never tried, as a real experiment over the shared network. We want to see what happens.”

Claudio Allocchio, eMUSIC

“GÉANT offers a rich community of experts in the area of digital identity, authentication, privacy and security, so we could use this community to share our ideas with and to get feedback; we can also use this community to try and pilot our ideas with real users.”

Bob Huselbosch, WoT4LoA

“By the end of the day, I really hope that we can take something out of the project which will stand on its own, and for years to come will show people how to implement enterprise Wi-Fi, user-friendly and secure.”

Stefan Winter, SENSE

## SDN - SOFTWARE DEFINED NETWORKING

Current networking technologies are based on systems originally designed over 40 years ago. These systems rely on hardware elements (routers and switches) with built-in firmware that sets the rules on how internet traffic behaves, thus inherently limiting the possible data flows over the network. Over time, these limitations have proven to be not merely of academic interest, but also of practical concern, and increasingly crippling for the system going forward. The problem is overcome by decoupling the control operations from the data flow, allowing the former to be performed dynamically by specialised software – hence the emergence of Software-Defined Networking (SDN). This approach allows greater network flexibility and the potential for new networking paradigms to meet new demands.

GÉANT has been at the forefront of this research and has built one of the largest SDN testbeds in the world. This testbed includes an OpenFlow facility, which has proven of great interest to experts and innovators in the community. The projects in this area have a variety of objectives, from trialing “real life” SDN implementations in a simulated production environment, to investigating the use of emerging technologies such as autonomic networking and network coding in an SDN-enabled environment, to enhancing the facility itself by enabling multidomain OpenFlow, to developing a service that enables scientists to dynamically create their own private and secure virtual networks.

- **AUTOFLOW: Autonomic OpenFlow**  
SDN-enabled autonomic network management
- **CoCo: On Demand Community Connection Service for eScience Collaboration**  
a.k.a. “Community Connect”, to dynamically create private virtual networks
- **DREAMER: Distributed REsilient sdn Architecture MEeting carrier grade Requirements**  
testing a network based on OpenFlow/SDN in a production environment
- **DyNPac: Dynamic Path Computation Framework**  
testing a clean slate approach based on a SDN-enabled infrastructure
- **MINERVA: Implementing network coding in transport networks to increase availability**  
working to deploy a robust network coding architecture for OpenFlow
- **MOTE: Multi-Domain OpenFlow Topology Exchange**  
to enable multidomain OpenFlow

“Here we have the unique opportunity to evaluate clocks using the optical fiber link. And the fiber link itself, (we’ve demonstrated in the past that it) can provide us with such low uncertainty and high stability that we are really able to evaluate the clocks located at the two ends (London and Paris) as if they were close to each other.”

Harald Schnatz, ICOF

“The GÉANT OpenFlow-based facility provides a good opportunity for us to test our already validated algorithms in a local simulated (-based) environment into a real testbed.”

Kostas Tsagkaris, AUTOFLOW

“One of the promises of SDN is to offer open architectures to implement new services in a simpler way, without having to wait for suppliers to introduce new functionalities/features – so to give the freedom to the network provider to offer innovation at a lower cost.”

Stefano Salsano, DREAMER

# ARES

APPLICATIONS

## OPTIMISING NETWORK RESOURCES FOR GENOMICS

The explosive growth of genomic data is generating questions as to whether it makes sense to move large volumes of data when it needs to be processed, or if it wouldn't be better to take the processing to the data. "This is indeed our perspective," says Gianluca Reali, coordinator of the ARES project; "we are working on optimisation algorithms that use virtualisation to move data and/or processing depending on what is most convenient."

What is "most convenient" depends on multiple factors, ranging from technical to scientific, to clinical. Many parameters are fed in by the scientific partner GGB, while the algorithms are developed by the coordinating partner, the University of Perugia.

These work on top of NetServ, a middleware developed with Columbia University, which can dynamically instantiate services in the network. This is integrated with OpenStack to provide a user-friendly cloud interface.

The key element however is the signaling technology. "The NetServ-based back end uses NSIS signaling, and the bulk of our development is currently on this," continues Reali "the off-path signaling which searches the network for resources in the vicinity of PoPs that are traversed. The cloud is not sufficient, behind the cloud there must be an engine that can optimize these resources and reduce service time."

# MEAL

AUTHENTICATION

## EDUROAM, ANYWHERE, ANYTIME

Increasingly, education and research activities take place at locations where Wi-Fi is not available, outside institutional buildings and off campus. The MEAL project aims to bring the ease of eduroam access to these locations by extending the service to work over LTE.

LTE is seen as the key technology to realize public mobile communication networks. The two NRENs that collaborate on the MEAL project, SURFnet and Janet, both have individually explored the possibilities to offload the LTE data to their network. The technology however has not yet been implemented for international roaming. MEAL intends to fill this gap.

In the context of MEAL, this means that devices that gain access to the Janet network through LTE in the UK will also gain access via LTE in the Netherlands (and vice versa). The challenge is integrating the LTE and Wi-Fi protocols to offer a seamless service anywhere, anytime, and via any device.

"We have already tested it within the Netherlands," says project coordinator Frans Panken, "now we can also try to use it abroad within an international context, using the network of GÉANT to interconnect the networks of Janet and SURFnet, and to make it all work."

## THE REACTION TEAM AT OFC 2014

In March of this year, the team of researchers from the REACTION project presented their work at the 2014 OFC Conference in San Francisco.

The REACTION partners are a mix of public and private: the Italian research center CNIT, the Universitat Politècnica de Catalunya and the Spanish Telefónica. They share a broader collaboration in the EU IDEALIST project, which brings together major european telecoms and public research labs to study elastic optical network technologies. Some key issues emerging from this work are taken up by REACTION, in particular a new transponder technology that enables so-called "sliceability" in optical networks.

At OFC the team presented not only their current work on sliceability, but also a special post-deadline paper describing an experiment on network re-optimization based on the innovative ABNO architecture. Both presentations were extremely well received, which bodes well for the industrial take-up of their solutions:

"For UPC and CNIT this is an important step in an ongoing research process," says Filippo Cugini, coordinator of the project "but for Telefonica, the aim is to standardise these solutions and propose a new standard to IETF, which would require vendors to provide support for it in their products."

## MINERVA

SDN - SOFTWARE DEFINED NETWORKING

## NETWORK CODING IN PRACTICE IN TRANSPORT NETWORKS

Network coding (NC) is a technology that promises to more than double network capacities while increasing reliability and security. Although NC was originally designed for transport networks, an implementation at this layer is not yet available.

The MINERVA project is working to fill this gap and implement robust network coding methods in the GÉANT OpenFlow facility: "We are seeking methods that are bandwidth-efficient, easy to implement, and scalable; easy to maintain protection methods which could be implemented in practice;" says project coordinator Peter Babarczy, "we have been working on this topic from a theoretical point of

view for years, but this is the first time we can implement it in a real, large scale network."

The MINERVA partners, MTA-BME Future Internet research group and the i2cat Foundation, are both well known for their work in this area, with numerous IEEE publications and several prestigious awards to their name. They already have a successful NC implementation that was demonstrated at the latest Sigcomm.

MINERVA is implementing a proof-of-concept for the practical applicability of network coding in SDNs in the key areas of video streaming and distributed storage.



# ***ELIXIR AND EDUGAIN: SINGLE SIGN ON FOR THE BIOMEDICAL COMMUNITY***

***AT TNC2014, ANN HARDING OF SWISS NREN SWITCH,  
PRESENTS ON 'CASE STUDIES IN FEDERATED  
IDENTITY MANAGEMENT FOR RESEARCH  
COMMUNITIES'. THIS ARTICLE GOES BEHIND  
THE SCENES TO UNDERSTAND MORE.***

Over the past years, many NRENs have successfully built national federations by deploying authentication and authorisation infrastructures (AAI). GÉANT designed, developed and launched eduGAIN to support cross border use cases and as more and more federations become members of eduGAIN, the foundation for delivering federated identity is solid.

In the current GÉANT project (GN3plus), the AAI providers of eduGAIN and the scientific communities of FIM4R (Federated Identity Management for Research) have teamed up to deliver a series of pilots that address some of their challenges. CONNECT spoke with ELIXIR (the European Life Science Infrastructure for Biological Information), on one of its Pilot Actions between the European Genome-phenome Archive and CSC, to understand more about their challenges and how they are being addressed.



# INTERVIEW WITH TOMMI NYRÖNEN, HEAD OF ELIXIR FINLAND HOSTED AT CSC - IT CENTER FOR SCIENCE

## WHAT IS ELIXIR? CAN YOU TELL US A LITTLE ABOUT YOUR USERS/SERVICES?

ELIXIR is a distributed research infrastructure, where leading organisations from 17 European countries and EMBL (European Molecular Biology Laboratory) have joined forces to tackle the challenge of data volumes created by modern life science research. In Finland, our node hosted at CSC - IT Center for Science is working with local organisations that do, for example, molecular level studies of cancer, genetic diagnosis of dogs and horses, and basic research of resolving the birch tree genome. The amount of data produced by research of this type is one challenge, but it is also demanding of expertise. The created data has to be annotated and structured according to international standards, and shared collectively with other countries.

## WHAT ARE THE MAIN CHALLENGES FACED BY ELIXIR IN MAKING YOUR SERVICES AVAILABLE ON A PAN-EUROPEAN BASIS?

When you think of the examples above, it is clear that life science ecosystem is global. No country can manage in isolation. The application of genetics in healthcare is emerging at an accelerated speed as the public starts to understand the possibilities from examples (e.g. 23 and me) and applications that emerge from services targeted to animals (e.g. [www.genoscoper.com](http://www.genoscoper.com)). There are examples of rare diseases caused by genetic variation that must be put to the larger reference data context before they are properly diagnosed. The doctors seek to diagnose the root of the diseases, and they will be able to optimise treatments when provided with molecular level data.

Now, this is a real challenge.

How do we make data available on-line for research to create services that pull intelligence for those who need it when they need it? Once a service has been created relying of the data, how do we keep the whole distributed infrastructure together so that critical operators like healthcare could build on it? These types of challenges outline what ELIXIR nodes like EMBL-EBI and CSC need to make happen in ELIXIR in collaboration with the European e-Infrastructure.

## HOW ARE YOU AND GÉANT WORKING TOGETHER TO OVERCOME THESE?

Research data volumes have to move seamlessly around the continent. The reference data of human genetic variation alone is hundreds of terabytes. The created and published data needs to be shared and catered back to research effectively. On top of that ELIXIR provides data sets describing other animals, insects, plants, bacteria, viruses and all other life forms of the planet. Volumes more than double every year. This is where GÉANT and national research and education network providers play a key infrastructure role. The goal is that on-line processing of biological data is brought near the researchers where they need and when they need it. This way, we are eventually able to create biotechnology applications. When discovery of existing research data stored in ELIXIR data centers are made easier, so savings are also possible as duplication of basic research reduces.

## WHY DO YOU CHOOSE EDUGAIN TO HELP YOU DELIVER?

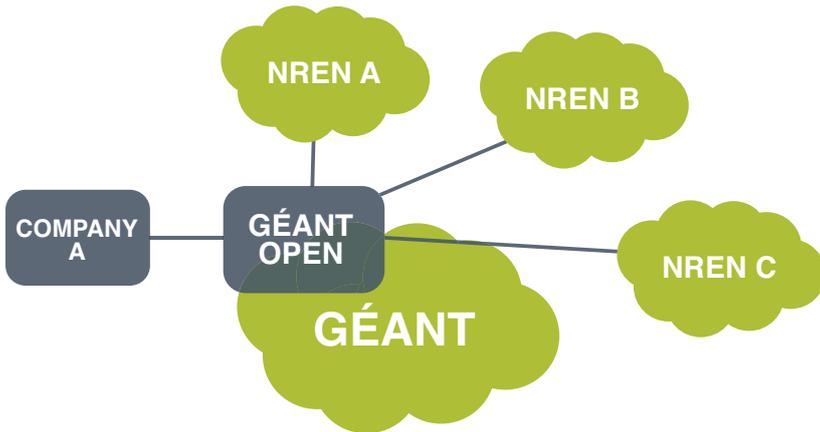
eduGAIN is a prospective component to providing single-sign for the biomedical community services that need login. Most of the data produced by public research is shared on the Internet. However, in some cases data needs to

be protected at least for a certain time for ethical, legal, societal or business reasons. In these cases the data service providers who host, distribute and share that data have to create an access control mechanism. In the case of ELIXIR, the plan is this is made with the bodies who have the authority to grant access based on e.g. application of acceptance of terms of use. Typically these are the original data creators like leaders of EU framework projects or biobank sample cohorts. We have decided to rely on the existing European network of trust, eduGAIN, to first electronically identify researchers who seek an access-controlled dataset for their work. Once the proper level of assurance on the identity has been achieved, the so-called data-access committees can process the requests based on the rules that apply to the protected data using tools provided from ELIXIR.

## HOW WOULD YOU LIKE TO SEE EDUGAIN DEVELOP IN FUTURE?

I think the eduGAIN and GÉANT enabling user actions have been instrumental in getting forward together to work on life sciences data infrastructure challenges. Especially for open but sensitive data we must offer a level of security to ensure that users having access to data are recognised researchers. Scientific communities stand at different starting points in the implementation of the federated identity management technologies. Proactivity from the eduGAIN provider to understand the needs of the life science community is highly desirable, and vice versa; the life science community needs to learn what to expect to be delivered by eduGAIN.

**Words**  
Paul Maurice,  
interviewed  
Tommi Nyronen,  
Head of Elixir  
Finland hosted at  
CSC - IT Center  
for Science (left)



**Words**  
Karl Meyer,  
Product  
Marketing and  
Communications  
Officer, DANTE

**Diagram**  
Services  
connected via an  
NREN can use  
GÉANT Open to  
interconnect with  
other networks,  
or with services  
offered by  
commercial third  
parties

# GÉANT OPEN

## OPEN FOR BUSINESS

### WHAT IS GÉANT OPEN, AND WHY IS IT IMPORTANT?

GÉANT Open is a new production service which allows NRENs and approved commercial organisations worldwide to exchange connectivity in an efficient and flexible way. This marks the first time within the European R&E community that approved commercial organisations are able to tap into the GÉANT network, and demonstrates GÉANT's commitment to promoting global collaboration and strengthening links with industry.

### I'VE HEARD OF THIS BEFORE. WHAT'S NEW?

The GÉANT Open pilot began in October 2012 (see CONNECT Issue 9), and following that successful phase has now moved to a production service, thereby benefiting from the same SLA (service level agreement) structure and 24x7 monitoring and support as the award-winning GÉANT backbone network.

### WHAT BENEFITS DOES IT OFFER PARTNERS?

Growing numbers of projects are now public-private partnerships (PPP) and interconnections between NRENs and commercial parties are becoming commonplace. GÉANT Open will help simplify connectivity between PPP project partners and support this growing area.

Also benefiting from the new service are international partners needing to manage multiple interconnections, and who wish to harmonise their international circuits. NRENs wishing to arrange private connectivity can also use GÉANT Open to facilitate these requirements.

**"GÉANT Open adds another facet to the range of value added service offerings from GÉANT. By enabling public-private interconnectivity, GÉANT Open enables research teams to work even more closely with private organisations across the world," adds Domenico Vicinanza, Product Manager, GÉANT.**

Domenico Vicinanza, Product Manager, GÉANT.

### FEATURES OF GÉANT OPEN:

- Protocol neutral, allowing each participant to connect to the exchange at between 1Gbps and 100Gbps.
- Connections can be logically sub-divided into separate VLANs allowing the participant to connect with many other members of the exchange simultaneously.
- Participants can also apply to make connections from GÉANT Open through the GÉANT network – allowing onward connectivity to organisations that are unable to connect directly to GÉANT Open.
- Based in Teleticity, London the exchange will be able to support both European and worldwide interconnections.

For more information, see:  
[www.geantopen.net](http://www.geantopen.net)

# Q&A WITH TIM BOUNDY

## EDUCONF PRODUCT MANAGER

**WITH THE EDUCONF SERVICE BEING LAUNCHED AT TNC2014, CONNECT SPOKE WITH TIM BOUNDY, TO FIND OUT MORE ABOUT THE SERVICE AND HOW IT HELPS USERS.**

### COULD YOU EXPLAIN WHAT THE EDUCONF DIRECTORY IS?

Video Conferencing (VC) is a great way for research teams to work together. It can dramatically reduce the cost of travelling to meetings and saves huge amounts of time. Many modern systems allow computer screens to be shared and multiple sites to be connected. The eduCONF Directory has been designed to help users of Video Conferencing (VC) find suitable VC rooms and equipment and be able to be confident that they will work. The Directory is an international directory of VC systems that are available to NRENs around the world.

### WHY IS EDUCONF SO BENEFICIAL TO USERS?

Many people are still nervous about using video conferencing because it's not something they use every day. The aim of eduCONF is to help people think of VC as just another way to talk and work together. By using VC instead of going to a meeting, users can save hours of traveling time as well as the expense.

For the VC Manager, adding their rooms to the eduCONF Directory can help increase utilisation and improve the return on the investment of the equipment.

eduCONF also manage a monitoring service for the Global Dialling Scheme (GDS) helping to ensure that you video calls connect on the first attempt.

### WHEN WILL IT BECOME PUBLICLY AVAILABLE?

The eduCONF Directory is now live and VC managers can add their rooms to the system. The process is quick and simple and automatically checks the VC system before registering it in the database and producing a certificate that can be printed and displayed in the room.

The GDS Monitoring is also live now and NRENs are welcome to add their infrastructure to the monitored network.

### WHAT ARE THE MAIN BENEFITS FOR EDUCONF DIRECTORY CERTIFIED INSTITUTIONS?

The major benefits are increased visibility of the service and simplicity. With dialling details visible on the eduCONF website it will be much easier for users to use the facilities without needing IT staff assistance. Institutions can use the Directory certification or Quick Test service to ensure that VC rooms are regularly tested and any local problems are spotted early.

### WHAT CAN WE EXPECT FROM EDUCONF IN THE FUTURE?

As we move forward we'll be looking at adding even more facilities to the directory and by linking with eduGAIN we'll make it even easier to access the directory.



### YOU WILL HAVE A BOOTH AT TNC2014, WHAT CAN DELEGATES EXPECT?

At TNC we'll be showing how easy it is for managers to add their VC facilities to the directory and how users can then find VC rooms across Europe. We'll also be running a prize draw – everyone registering a VC room during May and June will be entered into a prize draw to win one of 2 Raspberry Pi computer kits, including Camera Boards

### WHAT IS YOUR ROLE IN GÉANT?

I have been eduCONF product manager for one year. This means I'm responsible for the delivery and development of the service.

### WHAT DO YOU SEE AS THE MAIN OBJECTIVES AND CHALLENGES IN YOUR ROLE?

The main objective is to make videoconferencing easier, and more useful to NREN users. The biggest challenges are coordinating a widespread team of international experts and attempting to address the varying needs of the GÉANT partners.

### WHAT DO YOU ENJOY MOST ABOUT YOUR WORK?

Working internationally and finding common interests with colleagues and friends around the world – (in fact eduCONF has a sub-team biker gang!).

For more information on eduCONF, visit the eduCONF website as [eduCONF.geant.net](http://eduCONF.geant.net).

To hear Tim discuss eduCONF in more detail you can watch the eduCONF web showcase at <https://www.youtube.com/user/GEANTtv/videos>

# GÉANT AND TERENA INVITE NOMINATIONS FOR COMMUNITY AWARDS



The GÉANT project and TERENA have this year collaborated to open up Community Awards to nominations from across the research and education networking community, and in February announced the call for nominations.

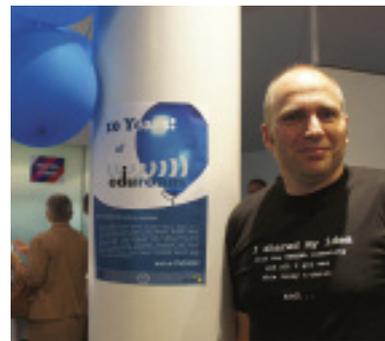
These awards are designed to show gratitude and respect to teams or individuals who have shared their ideas, expertise and time with the community. Such contributions are often provided voluntarily and through good will. These awards were introduced by TERENA in 2012, with recipients being honoured online and during the annual TERENA Networking Conference (TNC).

Up to three nominees may be selected by a panel of judges from among the GÉANT and TERENA

community. The winner(s) will be presented with a small personal gift during the closing plenary session of TNC2014 in Dublin, Ireland.

Selection criteria are focused around sharing an idea with the community that developed into something significant such as a well-used tool or service; making a significant contribution to a number of community activities over a sustained period; making significant contributions to important / recognisable developments within the past 12 month period. 'Winners' could be individuals or small teams of named individuals.

For the past few years, the TNC has been the place where public recognition has been given to members of the European research and education networking community for their contributions to the development of



relevant technologies and services or to collaborative community activities. The new nominations procedure, sponsored by the GÉANT project, not only opens the awards up to greater community engagement within Europe, but also invites nominations from and about people in other world regions.

**Words**

Laura Durnford, Senior Communications Officer, TERENA

**Picture**

The first community award winner was Klaas Wierenga, who was recognised in 2012 for sharing the idea for eduRoam with the TERENA community ten years earlier.

# GÉANT SHOWCASE: THE FIRST 6 MONTHS



If you've ever wanted a quick and easy way to get a more in-depth look at some of the activities within the GÉANT project, then you may be interested in the GÉANT Showcase.

This is a recent initiative born out of the training area, where subject experts from within the project give a 20-30 minute Adobe Connect presentation on a particular area of interest. Attendees register to join the session, and are able

to ask questions and interact with the presenter throughout. Archived sessions are then uploaded to GÉANT's YouTube channel, GEANTtv.

Subjects covered thus far include Testbeds-as-a-Service, Cloud services, eduCONF and Moonshot. Sessions planned for the future cover the GÉANT backbone, EUMETSAT, and Federation-as-a-Service.

The GÉANT Showcase is helping to build awareness and understanding across the project, and archived video on GEANTtv makes this expertise available to all.

Project participants can check the Showcase schedule on the project intranet, whilst archived sessions can be found on [www.youtube.com/GEANTtv](http://www.youtube.com/GEANTtv)

# OPEN CLOUD EXCHANGE

## DELIVERING CONNECTIVITY FOR HIGH PERFORMANCE CLOUD SERVICES

Throughout the R&E community the use of cloud services is rapidly increasing, due to the twin benefits of cost efficiency and scalability. At present most universities and research institutes have embraced typical lower order cloud services (such as email, storage and collaboration services). These services can typically be supported by the high performance IP networks provided by Campus and NREN systems without the need for enhanced Quality of Service (QoS) facilities.

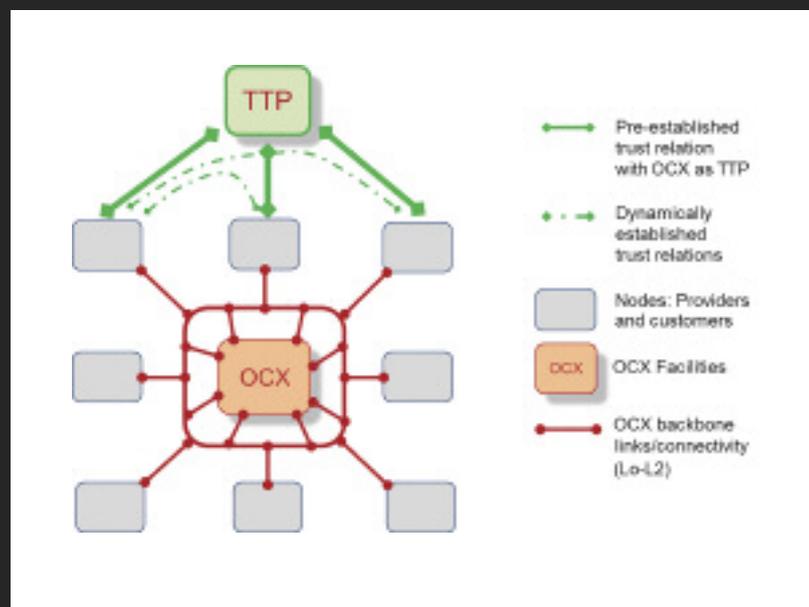
However as cloud usage develops and starts to offer higher order services (such as HPC and Big Data applications) the need will grow for dedicated cloud services delivery infrastructure to support these more demanding applications. This is where Open Cloud eXchange (OCX) comes in. The concept has been designed to support this need for enhanced connectivity and QoS.

As some of the key benefits of Cloud Services are rapid deployment and user self-provisioning, so the ability for OCX to work alongside Single Sign On (SSO) and Authentication and Authorisation Infrastructure (AAI) services to automatically identify network requirements and provision these would be a major benefit.

### HOW OCX WILL OPERATE

gOCX (GÉANT Open Cloud eXchange) is designed to enable layer 0 to layer 2 interconnectivity between the Cloud Service Provider (CSP) and the end user, working with a Trusted Third Party (TTP) to facilitate interoperation.

Initially, during the demonstration phases, provisioning would be manual but the use of SSO and SDN facilities to automate provisioning will be considered throughout the design process.



### PROVISIONING OF OCX

OCX facilities could be offered either within GÉANT or the NREN according to the needs of the users and the Cloud Service Providers. The model is applicable to both implementations and will be scalable and resilient to provide maximum availability for user communities.

OCX is in an early developmental stage and the design and concepts are being developed within GÉANT's Network Architectures for Horizon 2020 work area. For more information on gOCX and how this could benefit future cloud service provisions, download the OCX white paper at [http://www.geant.net/Resources/White\\_Papers/](http://www.geant.net/Resources/White_Papers/)

The OCX team will also be demonstrating their current work at the GÉANT Booth at TNC2014

**Words**  
Karl Meyer,  
Product  
Marketing and  
Communications  
Officer, DANTE

**Diagram**  
gOCX as a  
Trusted Third  
Party for  
establishing  
direct/dynamic  
trust relations

# GÉANT AT TNC2014: AT A GLANCE

## GÉANT BOOTH

Visit the GÉANT booth to see demonstrations on eduCONF, Open Cloud eXchange (OCX), and learn more about GÉANT Open and eduPERT. Catch up with GÉANT experts in areas such as procurement and project management as well as invited guests.

## GÉANT ASSOCIATED SPEAKERS

The TNC2014 programme will this year feature sixteen speakers presenting on a wide range of subjects covering the project's technology, service developments and other initiatives.

## GÉANT WORKSHOP PRESENTATIONS

### Monday, 19 May

16:00 to 17:30

Location: Lecture Theatre A

#### **Networking architecture**

*Gianluca Realí, University of Perugia speaking on ARES: Advanced Networking for Distributing Genomic Data*

16:00 to 17:30

Location: Lecture Theatre B

#### **Simplifying federation deployment**

*Wolfgang Hommel, Leibniz Supercomputing Centre (LRZ) of the Bavarian Academy of Sciences and Humanities (Germany) speaking on GÉANT TrustBroker: Dynamic inter-federation identity management*

### Tuesday, 20 May

14:00 to 15:30

Location: Lecture Theatre B

#### **Disruptive networks**

*Dimitri Staessens, GOOGLE speaking on RINA: AN Opportunity for NRENs to Lead Internet Research*

11:00 to 12:30

Location: Auditorium

#### **Cloud services for education and research**

*Session Chair: Roberto Sabatino DANTE  
Ronan Byrne HEAnet speaking on HEAnet Cloud Strategy*

14:00 to 15:30

Location: Lecture Theatre A

#### **Advanced networking**

*Ronald van der Pol speaking on Community Connection Service for eScience*

14:00 to 15:30

Location: Lecture Theatre C

#### **Supporting Innovation**

*Michael Enrico DANTE speaking on GÉANT Open Call  
Session Chair: Roberto Sabatino DANTE*

16:00 to 17:30

Location: Lecture Theatre C

#### **Federated identity in research and education**

*Ann Harding SWITCH speaking on Case Studies in Federated Identity Management for Research Communities*

16:00 to 17:30

Location: Auditorium

#### **Service delivery platforms**

*Y. Demchenko speaking on Open Cloud eXchange (OCX): Bringing Cloud Services to NRENs*

## Wednesday, 21 May

11:00 to 12:30

Location: Lecture Theatre B

### **Better safe than private**

*Roland Hedburg speaking on Allowing the user to define the attribute release policy*

11:00 to 12:30

Location: Lecture Theatre A

### **Global collaboration makes us stronger**

*Thomas Fryer DANTE speaking on Collaborating to Develop, Implement & Provide Global Services*

14:00 to 15:30

Location: Lecture Theatre A

### **SDN virtual networks**

*Lukasz Podleski speaking on Multi-domain Software Defined Network: exploring possibilities*

14:00 to 15:30

Location: Lecture Theatre C

### **1+1=3 in education**

*Domenico Vicinanza DANTE speaking on Experiments in collaborative art across R&E networks*

16:00 to 17:30

Location: Lecture Theatre C

### **Network monitoring**

*Trupti Kulkarni DANTE speaking on Circuit Monitoring in Multi-Domain Environment*

16:00 to 17:30

Location: Lecture Theatre A

### **Wire free and worry free**

*Frans Panken speaking on Making a MEAL of eduroam over 4G*  
*Stefan Winter speaking on SENSE - Secure Enterprise Networks Simple & Easy*

## Thursday, 22 May

9:30 to 11:00

Location: Lecture Theatre A

### **Bandwidth on deathbed?**

*Marcin Wolski PSNC speaking on How to move toward successful software development in Networking*

9:30 to 11:00

Location: Lecture Theatre C

### **There is work to be done: creating the GÉANT strategy**

## POSTERS

- The new perfSONAR
- Open Cloud eXchange (OCX): Architecture, Components, and Demo scenario
- Community Connection Service for eScience
- Multi-Domain VPN, a new network service
- Bridging Openflow/SDN and IP/MPLS - The Design and Emulation of a Hybrid Node in the DREAMER Project
- HEXAA: An External Attribute Authority solution for Research Collaborations
- Showcasing Open Calls

## BOF

### Tuesday, 20 May

18:00-19:30

Location: Lecture Theatre A

### **GÉANT Testbed services**

The session will look at innovative uses of the GÉANT Testbed services. Following a demonstration, BoF attendees will all join in the discussion to learn about the current testbed offering and uses, explore additional scenarios and use cases. If you use GÉANT testbeds or want to use them – come and share your experiences, lessons learned and ideas about future needs in an open forum.

## WORKSHOPS

### Sunday, 18 May

10:30 to 17:30

Location: Lecture Theatre A

### **eduPERT and ESnet present: An Overview in Emerging (and not) Networking Technologies - Part I**

Alessandra Scicchitano (SWITCH), Jason Zurawski (ESNET), Kurt Baumann (SWITCH)

### Monday, 19 May

9:00 to 12:30

Location: Auditorium

### **eduPERT and ESnet present: An Overview in Emerging (and not) Networking Technologies - Part II**

Alessandra Scicchitano (SWITCH), Jason Zurawski (ESNET), Kurt Baumann (SWITCH)



**Q&A WITH MELANIE PANKHURST,  
HEAD OF COMMUNICATIONS, DANTE.  
ACTIVITY LEADER, COMMUNICATIONS  
& PROMOTION, GÉANT**

## WHAT IS YOUR AREA OF RESPONSIBILITY?

I have responsibility for DANTE's marketing communications, including for the networking projects it manages. The largest part of the job is the dissemination and promotion of the GÉANT project, its network and services at European, national and international levels, across the research and education community.

## WHAT DOES GÉANT MEAN TO YOU?

Quite simply, innovation. The GÉANT project facilitates innovation: innovation by our users who are pushing research boundaries, and innovation within the GÉANT project as the teams constantly seek new solutions and technologies to take the network and services to the next level.

## WHY IS MARKETING COMMUNICATIONS SO IMPORTANT TO A PROJECT SUCH AS GÉANT?

We claim that we have built the highest performance R&E network in the world, with a suite of services offering the most secure, flexible bandwidth options. But if we don't tell anyone about it, there will be no users and no benefit to European research. "If a tree falls in the forest with no one to hear it fall, does it make a noise?"

Together with my team, it's my job to raise the profile of the GÉANT network, services and innovation, in order to demonstrate their value to our stakeholder groups and so support the project's objectives.

Over the past few years, as the services became an important part of the project, I have been evolving a product marketing and promotion function to support service teams with user-focus in service development, and to communicate the service benefits to NRENs, and assist them with channel promotion – the onward promotion to users at national level.

## WHERE DO YOU FEEL THIS HAS HAD THE BIGGEST IMPACT OVER THE PAST YEAR?

Every year the focus shifts slightly and we expand our remit, and the rewards are worth it. For example, the joint communications programme with Infinera to promote GÉANT's 500Gbps network upgrade won GÉANT two industry awards and a Guinness world record!

As always we work closely with industry titles such as Light Reading and Scientific Computing World who regularly seek our expert opinion. But it is our investment in developing press relations and social media that has really started to pay dividends. We now have

over 1,100 Twitter followers providing a constant stream of new contacts and opportunities to engage with stakeholders. For instance, with high profile journalists, with whom our growing relationships have resulted in unprecedented coverage in the national press, such as the BBC, The Guardian, The Huffington Post and some of the world's biggest technology outlets such as GigaOm and Wired – all of which help us raise the profile of the project far beyond the industry press.

## AS TEAM LEADER, WHAT DO YOU SEE AS YOUR BIGGEST CHALLENGE?

Meeting the demands and expectations for significant levels of communications activity under strong budget restraints. So right now, with plans to put together for the next GÉANT project phase (GN4), the challenge will be to get the right balance of work to support the project in its aims, taking the myriad and complexity of the (sometimes conflicting) needs of the many different stakeholders into account.

## WHAT PROJECTS ARE YOU AND YOUR TEAM WORKING ON AT THE MOMENT?

A whole range of projects:

- With DANTE's CTO, I have just finished authoring relevant parts of a Horizon 2020 Future Internet project submission.
- Working with international colleagues, we are developing an interactive global map showing GÉANT and other regional networks such as CAREN, RedCLARA, TEIN and so on, and with a drill-down function to show NREN details too.
- The TNC issue of CONNECT magazine is being put to bed (which you are now reading)
- The team is starting work on an AAI communications plan in keeping with the aims of the recently published and agreed AAI strategy
- The NREN GÉANT PR Dissemination survey results shows that over 70% of European NREN partners use the materials, news and web content that my team develops – this is a great indication that we're doing the right things here. Getting feedback and measures of our work is always so valuable to obtain.

## HOW DO YOU SEE THE NEED FOR INCREASED GLOBAL COLLABORATION AFFECTING YOUR ROLE?

With the increasing competitive pressure, there is some need for NRENs to show that they are not just an isolated national entity but are a part of a global collaboration (of NRENs). Similarly, some of the project's services, such as

eduroam, eduGAIN and perfSONAR have a user base beyond Europe. This means that I need to ensure that project communications and product promotion planning incorporates the international aspects and opportunities. I have also become involved in the newly established Global PR Network, a group of communications professionals from across the global R&E networking community, which has amongst its aims to share best practise and to work collaboratively on joint-interest projects, such as case study examples and developing a boilerplate clarifying the collaboration, for use by all NRENs.

## HOW DOES MARKETING COMMUNICATIONS IN RESEARCH NETWORKING COMPARE TO OTHER INDUSTRIES?

I've been involved with networking technology since the early days of commercial Internet - PIPEX, UUNET, software distributor Unipalm, digital TV client developer ANT plc – in marketing communications, PR, event management, channel marketing and product management. The work follows the same principles whichever industry or setting you are in. So, with marketing communications, the aim is always to bring about some change in behaviour, or even a thought process. Such as to influence a purchasing decision – or service usage decision in our case, or to demonstrate value for money to a funding body or investor. So, whether for profit or not for profit, we still need to reach out to different audiences for different reasons, all in support of the corporate objectives.

## WHAT DO YOU ENJOY MOST ABOUT YOUR WORK?

It's a cliché but the fact that I'm constantly learning and that everyone in the company makes a real difference.

## LAST MOVIE YOU WATCHED:

Groundhog Day – again.

## FAVOURITE FOOD:

Cheese and cake, not necessarily together!

## WHAT DO YOU DO FOR DOWNTIME?

At the moment I'm learning how to look after chickens and attempting to grow my own vegetables; and the occasional, highly prized weekend mountain hiking.

# EDUROAM - BEYOND THE CAMPUS

**eduroam® is the secure, worldwide roaming access service for the international research and education community. It allows any user to get network access at any institution connected to eduroam – irrespective of location – via their mobile device or laptop.**

**However, with the boom in mobile connectivity, NRENs (National Research and Education Networks) are continually looking for ways to meet the needs of users outside traditional research and education environments.**

**Here are just a few examples from across Europe, which we hope will provide inspiration to the wider community.**

## LIBRARIES

Funet, the Finnish NREN has plans to deploy eduroam in libraries - the Turku City Library is already connected - and other central locations throughout Turku.

Turku universities have been very positive in furthering the footprint of eduroam, with suggestions for making it available for staff and students within the city. This will help with organising events for instance, since with eduroam there is no need to arrange any other WLAN.

New locations are listed on eduroam.org location map and on the eduroam Companion mobile app, which help universities to raise awareness of eduroam within their locality.

## LEISURE CENTRES AND PARKS

In Austria, ACOnet has started another "eduroam in the city" initiative, currently working with the city administrations of Wien (Vienna) and Innsbruck.

While eduroam is already available at most universities in Austria and some other participating organisations like the Natural History Museum, this new initiative intends to extend the eduroam coverage outside campuses, using public WLAN infrastructure, to leisure areas, shopping streets, tourism hotspots and parks.

## CREATING AN EXTENDED CAMPUS

In Germany, universities in Munich and Ingolstadt are in the process of forming partnerships with public Wi-Fi providers to make the city into an extended campus.



follow. eduroam is also available in most of central Trondheim (Norway's second largest campus city) through a collaboration with the municipality and the university.

**TOURISTS AND SCHOOLCHILDREN**

CARNet the Croatian NREN offers research and education users on the islands Unije, Susak and Dugi Otok in the north of the Adriatic free-wired internet if they have an eduroam login. Serving tourists is a pleasant side effect as the network was originally established for schoolchildren on the islands.

Similarly, tourists also enjoy free wireless networks (when they own an eduroam login) in the city of Pula in Istria in Croatia. The Wi-Fi network PulaFreeAir has 17 locations in the city.

**HOSPITALS AND LAMPPOSTS**

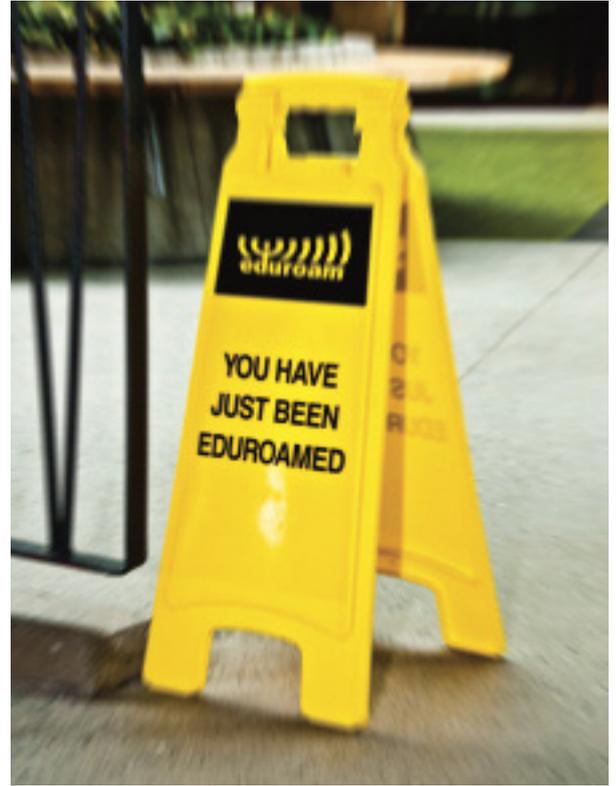
The UK extended its eduroam footprint through NHS teaching hospital trust collaborations. For instance in Oxford, eduroam overlaid onto hospitals' Wi-Fi network infrastructures supports medical students from across the UK at numerous teaching hospitals.

Cooperating with local authorities will also see greater eduroam coverage in city centres, particularly where local universities are involved in joint infrastructure or transport projects. In Cambridge, we could soon see eduroam-providing access points mounted onto city council lampposts.

Edward Wincott, eduroam Service Manager, Jisc said: "Having eduroam available outside the traditional campus empowers students, teachers, researchers and users. They can work, study and enjoy high performance internet access at locations of their choosing, making for greater productivity and satisfaction."

**OUTSIDE EUROPE**

eduroam, although a European invention, has spread to many parts of the world, including to Japan. In Tokyo, you can use your eduroam login to hotspots at coffee shops, conference centres and major shopping centres in the city centre.



**RAILWAY STATIONS AND RESTAURANTS**

SUNET, the Swedish NREN and Wi-Fi provider (The Cloud) have an agreement giving researchers, students and staff at Sweden's universities access to a secure internet connection on the Cloud's 4,500 or so access points including airports, railway stations and even restaurants.

The SUNET – Cloud partnership represents an innovative approach in eduroam and is a big step forward, as it makes connectivity easier and provides users with secure mobile access to a global wireless network both at their home institution and in public places.

**AIRPORTS**

In Norway, UNINETT the Norwegian NREN provides free Wi-Fi access to students and researchers at 14 Norwegian airports across the country, from Kristiansand in the south, to Svalbard in the far north – with more to

**GOVERNMENT ORGANISATIONS**

In Belgium, Govroam was pioneered and launched in 2013 by Belnet, the Belgian NREN. The principle is the same as that of eduroam except end users are public services and governmental staff. When an employee from a federal government institution visits a local administration, they can easily surf their wireless network using the same credentials as at their home institution.

Each visited institution can also decide which access rights govroam users get on their network. Finally, administrations connected to the Belnet network do not have to pay additional costs for the implementation of govroam.

Belnet is keen to increase the number of public sector organisations and is actively promoting the many benefits. The service has now been rolled out in the Netherlands, in collaboration with SURFnet, the Dutch NREN.

Have you discovered eduroam in any unusual or innovative places? We'd love to hear your stories. Write to us at [connect@geant.net](mailto:connect@geant.net)



# FEDERATION AS A SERVICE (FAAS) – ENABLING NRENS TO OPERATE AN IDENTITY FEDERATION

As the demands of researchers and research projects increase as international collaboration becomes the norm, so does the need for NRENs to provide effective, secure Authentication and Authorisation Infrastructures (AAI).

By offering AAI, NRENs can provide essential value added services so that users can also take advantage of services and facilities offered by other NRENs. From ubiquitous eduroam® access to advanced cloud computing platforms such as –Okeanos global, AAI is an essential enabler for collaboration.

## BENEFITS ACROSS THE COMMUNITY

It is not only individual research users that benefit from AAI. Service Providers can offer their services to a much wider audience making their platforms more cost-effective and Identity Providers can dramatically reduce their workload as they no longer need to maintain identities of temporary or visiting researchers and staff. With Users, Service Providers and Identity Providers all benefiting from AAI, NRENs, Large International Projects and Institutions need to be positioned to support these requirements.

Yet despite the benefits of AAI, nearly half of all GÉANT partners don't yet have an Identity federation. This is not only restricting the ability of their users to gain access to services but could increase costs within the NREN.

## FAAS – ENABLING NRENS TO OPERATE AN IDENTITY FEDERATION

The development of a national Identity federation is not a trivial activity and GÉANT's Federation as a Service (FaaS) task was created specially to help these NRENs and other groups. FaaS will support NRENs in building their Identity federations by providing and hosting federation management tools on behalf of the NREN. The FaaS provides Identity federation operators with tools to perform the registration of Identity and Service Providers, effective Metadata management and aggregation including integration with eduGAIN, secure Metadata signing and central Discovery Service. By providing these tools to the NRENs, they will be able to focus on building the Authentication and Authorisation Infrastructure in their region by supporting the development of Service Provider and Identity Provider in member institutions.

**“AAI will become one of the key differentiators between NRENs and other network providers and its provision will aid the development of enhanced services to all users.”**

Valter Nordh

## Words

Marina Vermezovic,  
AMRES

## HOW YOU CAN BENEFIT FROM FAAS AND HELP

Effective AAI can greatly benefit NRENs and is a unique value added service for NRENs to provide.

FaaS is inviting NRENs to be at the forefront of this development by taking part in the workshop FaaS is organizing in October 2014, with more information soon to come. For more information on FaaS go to [URL] or contact Valter Nordh at [valter.nordh@gu.se](mailto:valter.nordh@gu.se), or Marina Vermezović at [marina@amres.ac.rs](mailto:marina@amres.ac.rs)

# THE GÉANT GREEN TEAM

## THE GREENING OF ICT AND WHAT WE CAN ALL BE DOING

A recent study by the Global e-Sustainability Initiative ([gesi.org](http://gesi.org)) suggests that the internet releases around 900m tonnes of CO2 a year – 1.9% of the world's CO2 emissions and as much as the aviation industry. In addition, the use of precious metals and rare earth minerals in IT equipment leads to even greater environmental impacts.

GÉANT and its National Research and Education Network partners (NRENs) and the wider ICT community have a responsibility to ensure they are working to be as environmentally sustainable as possible. To that end, The GÉANT Green Team was created in 2009 - to help promote environmental sustainability across the R&E community.

### WHAT ARE THE GÉANT GREEN TEAM GOALS?

Firstly, to stimulate ideas and promote best practice on the adoption of Green ICT for society, including research centres, the higher education community and industry and government. For instance to promote and support the uptake of carbon reduction based services, such as virtualisation, teleworking, and videoconferencing.

Secondly, to adopt energy efficient practices in the setup, management, support and decommissioning of networks, combined with the use of ICT technology to measure the success of reducing energy consumption in various sectors - crucial for the future of all networks.

### Words

Nadia Sluer,  
Project  
Management  
Assistant,  
TERENA

### HOW WILL IT ACHIEVE THEM?

In an effort to encourage more people to get on board, the GÉANT Green Team has developed a policy template to help NRENs create their own environmental policy, matched to the individual needs of that organisation.

The aim is to recruit as many NRENs as possible, in a positive drive to reduce greenhouse gas (GHG) emissions. Already 10 NRENs have taken advantage of this and it is hoped at least 20 more will have followed suit by March 2015. The benefits to NRENs are many:

- Make your efforts and work practices more sustainable.
- Ability to offer greener services to clients.
- Help research and education communities reduce energy usage.
- Educate the next generation in good, environmentally sustainable, work practices.

### WHY IS THIS SO IMPORTANT?

In order to reduce the impact of ICT on the environment, we all need to take responsibility and take action now. The human impact on the climate system is clear and it is extremely likely (95–100% probability) that our influence was the dominant cause of global warming between 1951 and 2010.\*

By developing a common environmental policy, NRENs can begin to adopt standards to measure overall environmental performance and set targets for efficiency. This will help to maximise the positive impact NRENs can have, boosting collective power which will help to stimulate, fund and support the greening of ICT.



\* The Intergovernmental Panel on Climate Change [IPCC]:fifth assessment report.



Colibrì (COLLECTION of pedIatric Brain Images and COLLECTION of pedIatric Brain Images - [www.colibri.net](http://www.colibri.net)) is a collaboration between 19 Italian scientific hospitals (IRCCS) – see map for locations - coordinated by three large partners: Bambin Gesù in Rome, "E. Medea" - Bosisio Parini in Lecco and San Raffaele Hospital in Milan.



# COLIBRI: A NETWORKING PROJECT FOR RARE DISEASES

**Words**  
Interview by  
Diana Cresti and  
Maddalena Vario  
of GARR

**Pictures**  
Dr. Fabio Triulzi,  
Project Lead  
(opposite); map  
shows centres  
involved in the  
project

A disease or disorder is defined as rare in Europe when it affects less than 1 in 2000. While this may seem to indicate a very small phenomenon, there are between 6000 and 7000 known rare diseases, affecting an estimated 30 million people in Europe alone. Indeed, rare diseases as a category are considered a public health priority for which the EU has established a specific policy.<sup>1</sup>

What rare diseases have in common is difficulty in finding the right diagnosis and scarce resources for medical research. Each disease has its own specific traits, and with only a handful of cases in any given region, networking is essential to be able to share information on it and to reach critical mass in understanding it and trying to find a treatment.

The Colibrì Project arises in this context. Funded by the Italian Ministry of Health, Colibrì aims to share magnetic resonance images (MRIs) between 19 research hospitals throughout Italy that specialize in the field of pediatric neurological diseases.

In this context, the network and specialized ICT have a strategic importance. We spoke with Dr. Fabio Triulzi, Project Lead of Colibrì.

1. [http://ec.europa.eu/health/rare\\_diseases/policy/index\\_en.htm](http://ec.europa.eu/health/rare_diseases/policy/index_en.htm)



“Certainly the technological aspect presents a challenge for the medical community. Each hospital is a fortress, because its primary objective is the defense of patient privacy. However medical data sharing is very important, so flexibility is necessary to circulate information between hospitals and colleagues. In relation to that, network and information technologies play a strategic role because they help to combine privacy and sharing. The interconnection of the Scientific Hospitals (IRCCS) via the Italian research and education network GARR since 2005 means a lot, not only technologically but also in terms of attitude towards sharing, because there is an awareness of being part of a network and of being supported by an advanced and reliable e-infrastructure, which makes data sharing safe and easy. For Colibrì, GARR created a virtual private network to provide high security for data travelling over the network, complemented by secure access via IDEM, the Italian identity federation”.

### **Let's say I'm a doctor who has just performed an MRI and I suspect the patient is suffering from a rare disease. What can I do?**

First, I submit the image to the evaluation of a committee to check whether it fulfills a certain set of prerequisites; then - but only after being approved by the committee - I share the image with the other centers. Of course, patient data are encrypted and what I share is just a protocol number.

At this point the other centers can offer suggestions, further analyze some of the tests and evaluate the case in a collegial manner: all this increases the chance of making a correct diagnosis. It may also happen that another center has already made the diagnosis, achieving a reliable genetic typing: in this case the image is “promoted” as informative to enrich the database and increase the critical mass of knowledge on a specific disease.

### **Is it important to make an early diagnosis regardless of the existence of a cure?**

Of course. This is always the case in medicine, one must try to figure out what the problem is regardless of whether there may be a therapy. Unfortunately many rare diseases don't have a specific cure, but a diagnosis is important in terms of family counseling because in most cases we find a disease with a genetic background, hence if I identify the disease and understand how it is transmitted genetically, I can provide important information both to the parents and to the patient.

Furthermore, there are diseases that can significantly improve with even small changes, for example in the metabolic diseases a proper diet can make the difference: clearly if I begin to treat the disease promptly, I have better chances of success.

### **How do you see the future? Do you plan to expand the project internationally?**

Yes, our idea is to extend our collaboration at the international level. We would like to understand what is happening outside Italy because we know that there are similar experiences elsewhere in the world: the key for the success of Colibrì will be in our ability to collaborate with more and more centers worldwide.

The goal of our network is to make sure that if we see, say 40 cases of a rare disease in Italy, estimating that worldwide, with over 7 billion people, there could be perhaps 7000 people suffering from this disease, thanks to an international network we could see 200 cases and this really makes the difference. Being connected to the Italian research network GARR which in turn is interconnected to the GÉANT international research network can be a strong added value, both in terms of technology and networking.

# NORDUNET CONFERENCE 2014



In NORDUnet is happy to welcome you to historic Uppsala and Uppsala University in Sweden 23-25 September 2014

The NORDUnet conference brings together about 200 R&E network executives and engineers, along with their university colleagues in administration, the faculty, and research. The conference is dubbed "the Nordic meeting place", but sees quite a few participants from across Europe and the rest of the world.

The theme for this year's conference is **Innovation**, with talks on the core topics of:

- Network Innovation
- Service Innovation
- Innovations in Big Data
- Campus Innovation
- Business Model Innovation

You will find the interesting program on the conference website (see box).

**Words**  
Gitte Julin  
Kudsk, DeIC

**Call for Lightning Talks**  
Submit a proposal for a lightning talk, and present your idea, successful project, cautionary tale, collaboration invitation, or even a quick tip in only seven minutes.

**See you in Uppsala!**  
Learn more about the conference and register at the conference website  
<https://events.nordu.net/display/NORDU2014/Welcome>

# CARNET USERS CONFERENCE CUC 2014 – CALL FOR PAPERS



Submissions for the workshops and conference papers to the CARNet Users Conference CUC 2014, entitled "Fasten your connection, we're taking off", is now open. We invite authors to submit

Conference papers (deadline for submission of full text is June 1) or Proposal for a two-hour or four-hour workshop (deadline for submission of proposals is May 15). All papers and proposals will undergo two double-blind reviews. One person can submit a maximum of two papers as the first author.

The official language of the Conference is Croatian and the authors will be expected to present their papers and workshops in Croatian language.

Lectures by invited or approved foreign speakers will be in English. Awards for the best paper and best presentation will be presented at the Conference.

CUC 2014 will take place in Zagreb, Croatia, on November 19-21 at Hotel Antunović.

You can submit your proposal following this link:  
<https://radovi.cuc.carnet.hr>.  
For more information please visit [cuc.carnet.hr](http://cuc.carnet.hr).

**Words**  
Goran Skvarc,  
CARNet

# BETTER HEALTH POWERED BY SUPERCOMPUTERS



In our aging society, health research is becoming more and more the top-priority of not only health-care providers and national governments, but also of academia and industry. All are convinced that in order to keep our economy healthy and growing, we need to keep our population healthy and able well into old-age. To achieve this, new technologies and medication need to be developed through a better understanding of the human body. High performance computing can increase this understanding by allowing researchers to model and simulate what goes on at the deepest and smallest levels of organs and physical functions as realistically as possible.

Since 2010 PRACE has supported 303 projects on 6 Tier-0 systems, 55 of which contribute to better health in

Europe. Out of the 8 billion core hours awarded 1.3 billion are dedicated to those health-related projects.

Dementia-related research is prominently represented with 9 projects awarded with PRACE Project Access and 2 with PRACE Preparatory Access. Of those 11 projects a total of 5 projects are linked to the EU flagship initiative **Human Brain Project**.

That health is an important topic for research and science is also made clear by the numerous national and European grants given to projects in this field. From the 55 PRACE-supported projects mentioned above, 8 are linked to **European Research Council (ERC)** grants, while 3 receive support under the **Marie Curie Research Fellowship Programme**. One more project receives an IDEAS-N grant. the Italian identity federation”.



**Words**  
Marjolein  
Oorsprong,  
PRACE  
Communications  
Officer

## HIGHLIGHTS

**Electrophysiology - Atomistic modeling** by Mounir Tarek from CNRS-University of Lorraine, France. His project is one of 7 multi-year projects that received allocations under the PRACE 5th (first year) and 7th (second year) Call for Proposals for Project Access. For each project year, PRACE awarded an allocation 28 million core hours on Curie TN @ GENCI@CEA, France, and 42 million core hours on SuperMUC @ GCS@LRZ, Germany, leading to one of the largest resource allocations since the start of PRACE in 2010 (140 million core hours in total). An article about Tarek's work will be published in **PRACE Digest 1/2014**.

Prof Federico Toschi of Eindhoven University of Technology, Netherlands uses the 41.16 million core hours on JUQUEEN @ GCS@Jülich, Germany allocated to his project **towards an improved cell based mesoscopic model for large scale blood flow simulations**. An explanatory article on his work can be found in the **PRACE Scientific Annual Report 2012**.

For more information, see: [www.prace-ri.eu](http://www.prace-ri.eu)



# DANTE SIGNS LOI WITH THE ACDC CONSORTIUM

**Words**  
Goran Skvarc,  
CARNet



**I**n March DANTE signed a Letter of Intent (LoI) to join the ACDC project as a user. Started in February 2013, the European Advanced Cyber Defence Centre (ACDC) aims to create a community of stakeholders joining forces to fight botnets. ACDC provides a complete set of solutions accessible online to

mitigate on-going attacks and targeted both to end-users and to network operators. It also consolidates the data provided by various stakeholders into a pool of knowledge, accessible through the ACDC central clearing house.

ACDC reaches out to users across Europe through 8 national relay centres. ACDC currently operates as a

30 months EU-supported pilot project, ending in July 2015 and aims to continue as a self-sustained infrastructure beyond the end of the project. Initiated by 28 partners from 14 countries, ACDC is open to stakeholders from industry, public authorities and academia across Member States.

ACDC will provide tools and sensors to detect botnet related cyber-threats and mitigate cyber-attacks on networks, web sites, end user computers and mobile devices. The project intends to deploy a comprehensive set of national support centres throughout 8 Member States interconnected to the ACDC central clearing house. Through this networked approach, ACDC will also pave the way for a consolidated approach to protect organisations from cyber-threats and support mitigation of on-going attacks through easy access to an increasing pool of solutions.

ACDC services will be freely accessible at [www.botfree.eu](http://www.botfree.eu) or through one of the national support centres, one of which is located at the Croatian Academic and Research Network – CARNet. CARNet, in cooperation with other partners, has successfully become involved in the implementation process of the early-phase pilot project within the framework of the ACDC. The individual components of the system developed by CARNet and its project partners were successfully tested in October 2013 as part of the early-phase pilot project. The early phase of the pilot was

thereby initiated, consisting of test components that started submitting data to the test central clearing house, the central system component that is at the core of this project.

The success of the early-phase pilot is a prerequisite for further development of the system, its upgrades and adjustments, as well as for the realisation of one of the main goals of the project – an efficient combat against botnets.

By means of a number of actions, CARNet is working on the introduction and safe use of ICT in the academic and educational community in Croatia. A result of the acknowledgment of that role is CARNet's engagement in this project supported by the EU. Two other of DANTE's academic partners are also involved in the project - DFN-CERT and FCCN – Foundation for National Scientific Computing.

Together with other project partners, and now DANTE, CARNet intends to increase combat against botnets to a new level.

ACDC is a European pilot project funded under the CIP-PSP program, with a total cost of 15.5 M€ and funding of 7.7 M€.

## What are botnets?

A botnet is a collection of Internet-connected programs communicating with other similar programs in order to perform tasks. This can be as mundane as keeping control of an Internet Relay Chat (IRC) channel, or it could be used to send spam email or participate in distributed denial-of-service attacks. The word botnet is a combination of the words robot and network. The term is usually used with a negative or malicious connotation. In 2012, one of the most dangerous botnets was 'Grum' – which was responsible for sending 18 billion spam messages per day and 18% of the world's spam.

Source – Wikipedia and Kindsight Security Labs.

# CALLING ALL DEVELOPERS!

2014 is a great year to be a developer in GÉANT, there are so many exciting services and systems being developed across the project.

We are excited to announce the Summer School for Developers which will take place in Poznan, Poland from 22 – 26 September (final dates TBC). Similar to previous events it will be a kind of coding retreat aimed at providing an opportunity to meet other developers and share ideas and

experiences. It will use well-known methodologies, code refactoring with a clear focus on testing and best practices.

Then expanding on the security aspects of the Summer School, we will be running another ever popular Secure Code Training course at DFN, in Berlin on the 28th – 30th of October 2014. The course will run from midday on day one until midday on day three to enable travel to and from the venue.

To ensure maximum involvement from participants. We are interested to hear from any developers in the project, including the Open Call Projects who may have special interest in particular topics being covered. Now is your chance to influence the Secure Code Training programme!

You can find the survey at: <https://www.surveymonkey.com/s/sct14-input>



# MULTIMEDIA COLLABORATION AT NIIF/HUNGARNET: LOOKING BACK AND THINKING AHEAD

Science in Brazil: Never too late | videotorium.hu

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Science in Brazil: Never too late  
Science in Brazil: Never too late

Sergio Machado Rezende (Former Minister of Science and Technology - Ministry of Science and Technology, Brazil) 0 by rating: ☆☆☆☆☆

Some numbers on Brazil

- Population: 195 million (5th largest)
- Total Area: 8.5 million km<sup>2</sup> (5th largest)
- GDP (2010): US \$ 2.3 trillion (6th largest)
- Foreign Reserves: US \$ 320 billion

World Science Forum 2011 - Plenary Session I. "The Changing Landscape of Science: Challenges and Opportunities" session

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Uploaded by: NIIF Intezet  
Time of recording: November 17, 2011

Keywords: world, science, forum  
Research area classification: Science policy

For 25 years, NIIFI, the National Information Infrastructure Development Institute (the Hungarian NREN) has been providing the academic, research and public collection community with a leading edge communication, information, and collaboration infrastructure. Provision of multimedia (voice, video and data) collaboration services is among the major elements of that effort.

Successful activities from the last ten years include:

- **VoIP service**, started in 2002, based on SIP, the leading-edge protocol at that time. Since then we have been using private ENUM tree for inside call routing.
- **Videoconference service**, from 2003, comprising a professional room-based video conference system with multipoint MCU and gatekeeper service, based on H.323 and the open source GnuGK as gatekeeper.
- **Our Video on Demand / Video Sharing Repository and Conference Streaming service** started in 2003. It has been gradually improved and later rebranded ("Videotorium", see <http://videotorium.hu>). It is also eduID/eduGAIN enabled, stores videos up to full HD resolution, synchronises videos with presentation slides or synchronizes two simultaneous video streams.

From the beginning, these services have been very popular both in Hungary and abroad. The NIIF MCU has hosted numerous international VC sessions. NIIFI has been continually providing technical support to the user community and we put special emphasis on the continuous improvement of our multimedia collaboration service portfolio. Development is directly related to the international co-operations of our development team and joint efforts with our partner NRENs.

The NIIFI expert team has been exchanging experiences at all related global NREN platforms from the beginning of the European co-operations on these topics, from contributing to the activities of the TERENA task forces to significant deliverables like the TERENA SIP Handbook.

Another important area of our contribution is the NRENum.net trial, and later the related service. The Hungarian +36 country code has been delegated in 2006, the year NRENum.net trial was born. During the transition from trial to service, NIIFI has been operating the nrenum.net master DNS server, delegating country codes, and supporting the entire global NREN community. We have implemented a number of improvements, e.g. DNSSEC in NRENum.net tree, by this way improving NRENum.net tree security. Furthermore, NIIFI introduced and has been operating the <http://crawler.nrenum.net> crawling service that helps monitoring ENUM tree usage.

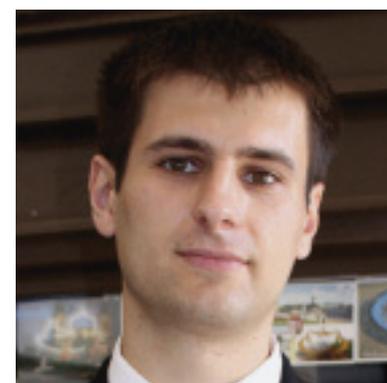
NIIFI has also been contributing to all GÉANT oriented co-operations in the area. András Kovács led the first eduCONF Service Activity and we participated in the GN2 Dubrovnik training. More recently, we presented a training course on WebRTC developments and on how WebRTC can be exploited by the NRENs.

Our goals are increasingly innovation oriented. We are in the middle of renewing our Videotorium service and passionate about utilising new and open technologies such as HTML5, adaptive bitrate HTTP live streaming, support for mobile devices, etc. We are working hard to re-implement, from scratch, our service to make it open source and share the benefits among the wide NREN community.

We foresee a substantial increase in the number of users being able to access Videotorium as a result.

Last but not least, we are excited about another HTML5 collaboration technology called WebRTC JS API and underlying rtweb wire line protocols. We have been following the standardization processes of both IETF and W3C and investigating the

**Words**  
Mihály  
Mészáros,  
NIIF/Hungarnet



complicated underlying protocols (ICE, TRICKLE ICE, etc.), and attractive benefits (e.g. NAT, Firewall traversal, multiple IP addresses, IPV6 smooth transition, security improvements), as well as gathering information about implementations, frameworks, troubleshooting interfaces.

We know that in order to understand (and master) WebRTC in depth we have to go through a learning curve. We have to pilot and learn from mistakes, but we also know Niels Bohr's famous quote\* and we won't give up! That's why we're also investigating WebRTC security architectures and integration with SAML based eduID/eduGAIN federations, keeping in mind that E2E authentication by using SAML based AAI is very challenging. Our interest is elevated not only by the open source opportunity but also by using the latest leading edge IETF technology and the possibility of improving the protection of communication and privacy.

We recently submitted a well-received proposal suggesting not only studying WebRTC technology and the implementation options but also piloting a GÉANT level collaboration service based on that novel technology. Numerous NRENs have expressed their interest in collaborating if accepted.

\* "An expert is a person who has found out by his own painful experience all the mistakes that one can make in a very narrow field."

- as quoted by the Hungarian-American Edward Teller from Niels Bohr (LIFE magazine 1954)

# WHY YOU CANNOT AFFORD TO IGNORE IMENTORS:

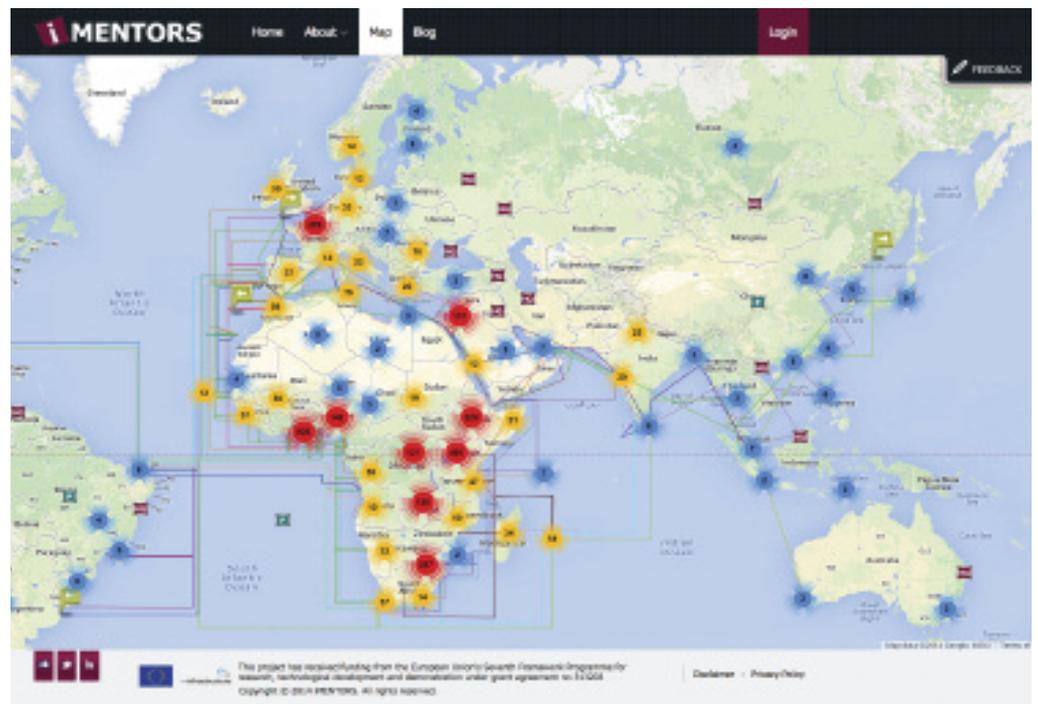
## MAPPING E- INFRASTRUCTURES IN AFRICA AND SUPPORTING THE EMERGENCE OF GLOBAL VIRTUAL RESEARCH COMMUNITIES

iMENTORS ([www.imentors.eu](http://www.imentors.eu)) is an interactive resource, the first of its kind, to contain information about all known e-infrastructures in Africa in the past five years. Launched for public use and input in July 2013 iMENTORS provides you with the necessary tool to visualise e-infrastructures and all related projects in Africa.

In December 2013 iMENTORS released version three of its platform, which contains data across a multitude of entities, classified as organisations, research infrastructures, fibre networks and projects and lays a foundation for better services, encourages research and connects cross-continental progress. The next step is to consolidate the results of our vast data collection efforts through crowdsourcing and citizens' input.

By mapping e-infrastructure initiatives, the project aims to help scientists, universities, research and education networks, students, IT engineers, e-infrastructure and technology providers, independent users as well as policy-makers and international donors to:

- Access and make creative use of the vast amount of data available.
- Stay up to date with latest developments and trends in the e-infrastructures sector.
- Understand the importance of e-infrastructures impact on societal development.
- Contribute to the data store and enrich it.
- Exchange ideas, expertise and best practices or find contacts and opportunities in e-infrastructure development.
- Appreciate the results and benefits arising from research and feel more confident in how tax money is spent.



- Communicate with other users and influence e-infrastructure providers.
- Pass on knowledge and experience to others, and make a contribution to the knowledge society.

As of the end of the 2013, iMENTORS database holds detailed information on over 2000 organisations and 150 projects. The third version of the platform contains updated information on Organisations, ICT Projects, and e-infrastructures. It is crowdsourcing-enabled, so that registered users can submit information to the project via the online platform. iMENTORS also includes information from CORDIS and the World Bank database, in order to create the largest online repository of e- infrastructure data. It is accessible

through a simple registration and login process with no costs involved.

The iMENTORS team is currently exploring how to integrate open aid data pulled from the IATI registry, in an attempt to expand the application of the platform on other ICT4D fields.

Data acquisition and validation will continue to progress until the end of the project. By the end of the project the interactive system will contain at least 80% of all e-infrastructure available in Africa.

iMENTORS, co-funded by the European Commission's DG CONNECT under the Seventh Framework Programme, Stockholm University and Gov2u.

Take a look at the map:  
[www.imentors.eu/map.html](http://www.imentors.eu/map.html)

For more information visit:  
[www.imentors.eu](http://www.imentors.eu)

# EGI PROVIDES CLOUD COMPUTING FOR EUROPE



The European Grid Infrastructure has over ten year's experience providing researchers with access to distributed computing resources. This month their cloud computing offering, the EGI Federated Cloud, goes into full production.

The Federated Cloud began life in 2011 with a small group tasked with investigating how EGI could provide the European Research Area (ERA) with cloud resources they could trust. Over the last three years the activity has grown building a cloud environment based on open standards to service researchers. The infrastructure federates resources from multiple providers to provide advanced compute capabilities, virtualised resources and cloud storage.

The service is open to all European researchers providing access to services just like the commercial providers. Users are able to setup and operate custom services, applications and simulations within virtualised hosting environments. With resources currently spread over seven countries the infrastructure is pan-European and open for business.

Said Andres Steijaert, leader of the GÉANT Support to Clouds Activity: "EGI and the GÉANT cloud services team are currently exploring possible collaborations on cloud services to help

deliver effective solutions to the R&E sector"

Crucially EGI has not built any new technologies or tools to do this but integrated existing foundations with cloud specific tools and services. "Reuse and evolution of current solutions has been key, meaning we didn't need to reinvent the wheel, but utilise our limited manpower most effectively" explains David Wallom from the Federated Cloud Task force "Using pre-existing open standard where possible the Federated Cloud works for researchers and providers equally."

Until recently the system has been running as a testbed. During this time the team and select user communities have been proving ideas, testing tools and fixing bugs. The proof of concept work that has gone on has been driven by some of the biggest areas of research already using the European grid's resources but also communities still in their infancy.

One of the keenest communities has been the virtual e-laboratory for biodiversity researchers, BioVeL. They have seen the potential of the Federated Cloud and are already in production with many of the tools they provide with more to come.

Structural biologists and life science researchers have also got support. WeNMR has been helping

**Words**  
Neasan O'Neill  
EGI.eu  
Communications  
Manager



these scientists to use the European grid for almost as long as there has been a European grid and have now started with the Federated Cloud.

On the horizon are other potential big users like EISCAT\_3D (E3D). E3D is a future experiment that will study the atmosphere in the Arctic and to investigate how the Earth's atmosphere is coupled to space. They have worked with EGI to show how the Federated Cloud could provide their computing needs when they get started in 2018.

A lot of work has gone on in the last three years to build a cloud for the ERA, that cloud is the EGI Federated Cloud and it is ready to support the Europe's researchers now.

For more information or to get access contact EGI at [support@egi.eu](mailto:support@egi.eu).



# **KAREL VIETSCH**

## **24/11/1952 – 23/02/2014**

On 23 February this year the research and education networking community experienced a sad loss when it was announced that Karel Vietsch had passed away, following a long illness.

**K**arel had been TERENA's Secretary General from March 1996 until March 2012, when illness prevented him from fulfilling his duties. In spite of this illness, Karel continued to show a strong attention to TERENA activities, providing information and support to the Secretariat staff and occasionally engaging with the wider community.

Karel was also instrumental in shaping the GÉANT community, not only in his role as Secretary General for TERENA, but also as a representative on the GÉANT governance boards, as well as leading the work on 'Status and Trends' in GÉANT (GN3).

His extensive knowledge, paired with his ability to commit fully to TERENA's goals, made Karel a respected personality in the wider research and education networking community. In 2013 Karel's outstanding contribution to networking and the Internet was rewarded; appointed an Officer in the Dutch Royal Order of Orange-Nassau, Karel was presented with the royal insignia during a private ceremony on 13 May.

Speaking on behalf of the TERENA Secretary staff, Acting Secretary General Valentino Cavalli said, "I would like to express the highest respect to Karel for having brilliantly shaped TERENA during all his years in service, as well as our gratitude for the message he gave us through his conduct in his work - thoroughly business wise and intrinsically ethical. We will miss you, Karel."

The blog page set up for people to leave condolences for Karel's family is highly illustrative of the impact he had on so many.

"Karel has left us and we will miss him – but most of us will remember him for his talent, enthusiasm and devotion. A key contributor to research networking has been lost by Karel's passing away – but the results of his efforts won't be lost. Indeed Karel has been a distinguished, eminent member of our research networking community and the effect of his involvement in our activities will stay with us also in the coming years and decades. Karel, rest in peace. We won't forget you and we remain indebted to you for your highly appreciated impact on our research networking activities in Europe and beyond."

– extract from Lajos Balint of NIIFI.

To leave a message, please visit <http://www.terena.org/news/3615/fullstory>

## Sad loss leads to Vietsch Foundation

Reflecting the comments from so many, of the better world Karel left behind for the R&E networking community, the positive outcome of this sad loss is the creation of the Vietsch Foundation.

In his last will, Karel gave instruction for the creation of the Vietsch Foundation which has inherited his estate. The mission of the foundation is to promote research and development of advanced Internet technology for the benefit of research and higher education, and related activities.

The foundation was registered as a not-for-profit organisation in the Netherlands as of 23 February and, in accordance with his will, a board has been established initially composed of Valentino Cavalli (Chair), Bert van Pinxteren, John Dyer and Antoinette Vietsch.

Karel's intention was for the foundation to administer his legacy and distribute it in the form of financial contributions to innovative projects to advance research and higher education, as well as awarding a Vietsch Medal annually - a recognition of individuals or teams who have significantly contributed to innovative and sustainable developments in the community.

The establishment of the Vietsch Foundation was announced during the opening plenary session of the TNC2014 (TERENA Networking Conference 2014) on 19 May in Dublin.

## Short biography

Karel graduated from Leiden University in 1975 with a major in mathematics and minors in economics and theoretical computer science. He was a teacher and researcher at Leiden University, and obtained a PhD in mathematics in 1979. After doing military service in The Hague, sharing one computer with twenty other conscripts, he joined Delft University of Technology as manager of the Department of Mathematics and Computer Science.

In 1984 he moved to the Science Policy Department of the Dutch Ministry of Education and Sciences, where he was involved in the implementation of the research part of the government's Computer Science Promotion Plan, which included the creation of a national research network, SURFnet. Climbing through the ranks within the ministry he became Head of Unit for Information and Infrastructure in 1992, whereafter in 1996 he joined TERENA as Secretary-General.

Karel's busy work schedule left him little spare time, but when he found some time off to travel he was keen to enjoy the atmosphere and culture of TERENA member countries.



# COMMUNITY STRENGTHENING AT FIRST WACREN REGIONAL CONFERENCE

Lomé, the capital city of Togo, played host to the first WACREN Annual Conference on 13th and 14th March this year with the presence of, among others, eight NRENs from the West and Central African region, delegations from NREN university members and ministries of higher education and research, as well as the African Development Bank, DANTE, the Economic Community of West African States (ECOWAS), the West African Economic and Monetary Union, ICANN, the Institut de Recherche pour le Développement (IRD), the University of Oregon's Network Resource Start-up Center (NSRC), RENATER and the World Bank.

Themed "Building a State of the Art Network Infrastructure for Research and Education", the WACREN Conference was hosted by the Togo NREN, TogoRER, and with a total of some 70 delegates, was opened by the Minister for Higher Education of Togo who emphasised the need for developing WACREN in the region. The conference programme gave centre stage to the NRENs in the region and the opportunity to describe developments in each of their countries, showing that with operational networks now in place in Senegal and Nigeria, the other NRENs in the region are making good progress towards implementing their own national infrastructure.

Following presentations from the African Development Bank, ICANN,

**Words**  
Tom Fryer,  
Senior  
International  
Relations Officer,  
DANTE

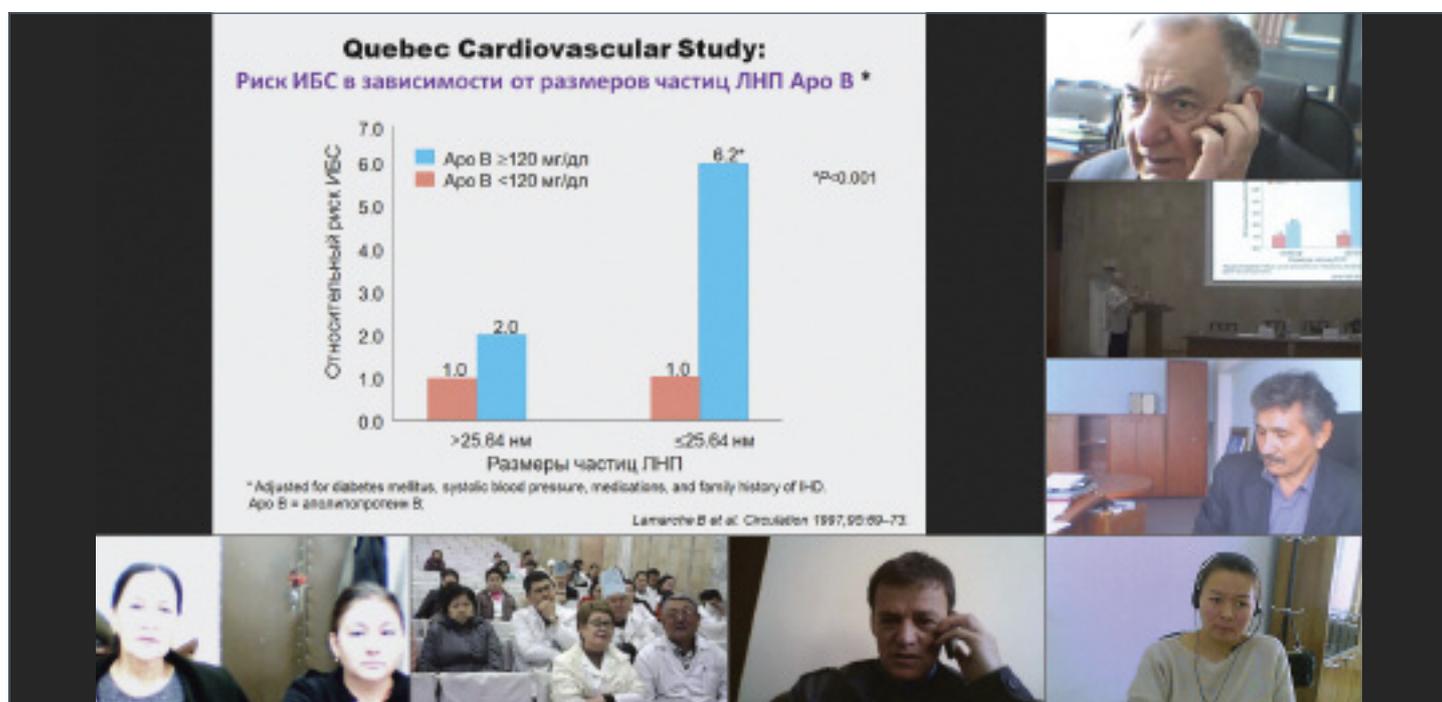
RENATER, IRD and the NSRC, the proceedings also included a practical side with workshops for the WACREN NRENs led by RENATER on GÉANT Campus Best Practice and by the NSRC on virtualisation.

Overall, the WACREN Conference proved to be a resounding success, providing for the first time a platform for all of the actors in the region and beyond to engage with each other and strengthen the WACREN community.

The Annual Conference was followed by the 2nd WACREN Annual General Meeting that, among other decisions, set the date for the next WACREN Annual Conference and General Meeting to 11-13 March 2015.

For more information on WACREN and the Conference, visit [www.wacren.net](http://www.wacren.net)

# CAREN NETWORK UPGRADE BOOSTS CENTRAL ASIAN CONNECTIVITY FOR SCIENTISTS AND STUDENTS



Following a successful tender phase, the Central Asian Research and Education Network (CAREN) has achieved a substantial upgrade which completed in March when the Tajikistan circuit became operational. This marks an important step towards upgrading the ancient Silk Road to a 21st-century high-speed Internet highway for research and education across the region and significantly improves connectivity between Central Asia and Europe and other parts of the world.

Operational since 2010, CAREN now interconnects scientists and students at over 300 institutions across Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan, with Uzbekistan also a candidate country. Circuits to Tajikistan and Turkmenistan have been upgraded to 155Mbps whilst Kazakhstan's and Kyrgyzstan's links

now operate at a capacity of 622Mbps and 600 Mbps respectively. The recent tender has quadrupled the link capacities and since the start of the project costs per Mbps have fallen eleven-fold - a major achievement considering the challenges of the telecommunications markets within Central Asia. The first phase of the CAREN project was successfully completed in October 2013. CAREN2 initially will run to March 2015. Discussions are underway to extend CAREN2 further with additional EC funding.

Increased bandwidth, together with improved network performance will provide an additional boost to research and education collaborations within the region and further afield in areas such as seismology, glacier monitoring, distance education and solar technology. A good example of the growing demand for bandwidth is

**Words**  
Helga Spitaler,  
Senior  
Communications  
Officer, DANTE

**Picture**  
Telemedicine  
session  
supported by  
CAREN

the Kazakh National Agrarian University in Almaty, one of the oldest academic establishments in Kazakhstan, which is continuing to increase usage as it connects its 10,000 students, 900 staff members and provides international connectivity for collaborations with over 20 partners across the globe.

Thanks to the higher capacity links, telemedicine is now high on CAREN's list of applications. Central Asian medical doctors and network engineers have started participating remotely in Asia Pacific Advanced Network (APAN) medical sessions and have recently started their own telemedicine events such as the conference organised on 26 March by the National Cardiology Centre in Bishkek, Kyrgyzstan with participants across the region joining remotely via high-quality video links (pictured).



# HIGH-SPEED NETWORKING: HELPING TO WIN THE RACE AGAINST SEVERE WEATHER

**W**ith extreme weather events increasingly hitting the news headlines around the world, accurate and timely forecasts are essential for effective disaster warning and mitigation systems. This, in turn, calls for joint research efforts within the global meteorological community to improve models and tools for predicting severe weather, such as hurricanes, tornadoes, cyclones, floods, heat waves etc. High-speed Internet connections, provided by ORIENTplus and its pan-European counterpart GÉANT, are vital for such international research collaborations.

In 2003 the World Meteorological Organization (WMO) established The

Observing system Research and Predictability EXperiment (THORPEX) to accelerate improvements in the accuracy of one-day to two-week high-impact weather forecasts for the benefit of society, the economy, and the environment. A key component of this programme is the THORPEX Interactive Grand Global Ensemble (TIGGE) project which facilitates research on numerical, probabilistic (i.e. ensemble) weather prediction by providing academic researchers access to ensemble forecast data collected daily in near-real time from 10 leading operational forecasting centres across the world. The databases and data portals have been developed by three archive and distribution centres: European Centre

for Medium-Range Weather Forecasts (ECMWF) in Reading - UK, US National Centre for Atmospheric Research (NCAR) in Boulder, Colorado, and China Meteorological Administration (CMA) based in Beijing.

The operational forecasting centres supplying daily forecasts are:

- European Centre for Medium-Range Weather Forecasts (ECMWF)
- US National Centers for Environmental Prediction (NCEP)
- Meteorological Service of Canada (MSC)
- Australian Bureau of Meteorology (BoM)
- China Meteorological Administration (CMA)

## Words

Helga Spitaler,  
Senior  
Communications  
Officer, DANTE



every day has been steadily increasing over the years mainly due to enhanced model resolution. The data exchange between ECMWF and CMA started at some 240 GB per day back in 2006. The latest figures show a flow of TIGGE data in the region of 500 GB / day from ECMWF to CMA and some 40 GB / day in the opposite direction.

In addition to the TIGGE exchange, ECMWF and CMA have a bilateral agreement by which CMA can make use of all operational real-time forecasts produced routinely by ECMWF. Data requested by CMA are transferred over ORIENTplus at approx. 50 GB per day.

Prior to the upgrade of ORIENTplus at the beginning of 2013, due to bandwidth-constraints the data exchange between ECMWF and CMA was feasible only via the third archive centre at NCAR in the USA. ORIENTplus has enabled the direct transfer between the two centres, making time-critical, complex applications with vast geographical reach and huge societal impact an everyday reality.

- Brazilian Centra de Previsao de Tempo e Estudos Climatico (CPTEC)
- Japan Meteorological Administration (JMA)
- Korea Meteorological Administration (KMA)
- Météo-France
- UK Met Office

High-speed data network connections, such as ORIENTplus, are vital for the seamless transfer of vast amount of data and the overall success of this invaluable resource for the global meteorological community. ORIENTplus allows for fast database synchronisation of the TIGGE archive, hosted by ECMWF and CMA. The volume of TIGGE data exchanged

## THE CHALLENGE

To meet TIGGE's mission to foster research on ensemble forecasting and the development of tools to improve the prediction of severe weather, based on the near-real time exchange of high volumes of ensemble data between multiple forecasting centres, including ECMWF in the UK and CMA in China.

## THE SOLUTION

By offering the highest capacity connection and the shortest network path between Europe and China, ORIENTplus and the pan-European GÉANT network enable daily direct, seamless data exchange between TIGGE database archive centres ECMWF and CMA, connected to the UK's research network Janet and the China Science and Technology Network (CSTNET) respectively.

## KEY BENEFITS

High-speed R&E network connections, such as ORIENTplus, are vital for supporting data-intensive, meteorological research tools, such as the TIGGE ensemble archive, aimed at improving severe weather forecasting and providing early warnings to civil protection agencies and the public. The UK Met Office, also supported by Janet, directly benefits from the collaboration between ECMWF and CMA, enabled by ORIENTplus.

**“TIGGE is a good example of international cooperation that provides a Petabyte-sized resource to the benefit of the research community as well as to providers and users of meteorological services. ECMWF alone has 2500 registered users worldwide. Without high-speed networks the daily database input and synchronisation between the archive centres would simply not be possible”.**

Manuel Fuentes, TIGGE Project Manager, ECMWF

To download the pdf of the case study please visit

[http://www.orientplus.eu/gfx/print/TIGGE\\_final.pdf](http://www.orientplus.eu/gfx/print/TIGGE_final.pdf)



# **NREN AND MEDICAL COMMUNITIES JOIN FORCES TO COMBAT DENGUE FEVER**

**The latest Asia Pacific Advanced Networking (APAN) meeting held in January in Bandung, Indonesia, saw the addition of a dedicated Dengue Fever workshop in the programme for the established APAN Medical Working Group.**

**Words**  
Helga Spitaler,  
Senior  
Communications  
Officer, DANTE

**Pictures**  
Workshop  
session at the  
APAN meeting



A joint APAN-TEIN\*CC initiative, the workshop took place on 20 January 2014, attracting over 30 attendees, including clinicians and researchers from within the multi-disciplinary dengue fever community, public health officials as well as National Research and Education Network (NREN) representatives from across the Asia-Pacific. Titled “Dengue Fever- Let’s STOP it!” , the workshop set out to provide a forum for participants to share experiences and best practices and to exchange ideas around how to manage, prevent and fight this infectious tropical disease. According to the World Health Organisation, Dengue Fever is putting almost half of the world population at risk. <http://www.who.int/mediacentre/factsheets/fs117/en/>

The discussions also provided an opportunity to explore how the NREN community and research and education (R&E) networks, at the national, regional and global level, can support the medical community’s international collaborative efforts to combat Dengue Fever in endemic countries and to prevent its spread. In addition to speakers from Pakistan, the Philippines, Bangladesh and Malaysia who attended the workshop in person, colleagues from Singapore, Sri Lanka, Australia and Japan joined the discussions remotely via a live video link provided by SingAREN, LEARN, AARNet and NII /NICT respectively.

All sites were able to view the presentations and follow the discussions in real time using the multi-point videoconference system

supported by their respective national R&E networks and the regional Trans EurAsia Information Network (TEIN). With high-definition images and stable connections, participants experienced videoconferencing first-hand, as a time- and cost-effective collaboration tool.

The presentations covered a wide range of topics, from clinical case management to relevant climate impact studies. A round-table discussion that followed focused on taking stock of objectives and activities, as well as on how to move forward by working together and sharing experiences and processes to better combat the resurgence of the disease in the region.

Participants agreed to build on the positive experience of the workshop and NREN-supported videoconferencing and to follow up with virtual meetings around specific topics and areas of research interest. Professor Leo Yee Sin (Tan Tock Seng Hospital, Singapore) stepped forward to facilitate the next virtual meeting on clinical case management.

Discussions are underway with NRENs in Latin America and the Caribbean, among other world regions, about adapting this workshop model to the local context to help build regional communities.

The driving force behind the workshop, Prof. Francis Lee Bu Sung, President of SingAREN and Chair of Governors of TEIN\*CC, commented: “This was a very inspiring event. I hope it will act as a catalyst for more joint actions. Everyone left with renewed energy and enthusiasm in

our quest to stop the spread of Dengue Fever and to improve its treatment!”

The presentations can be downloaded from <http://www.apan.net/meetings/Bandung2014/Sessions/Med.php> (please scroll down to mid-page).

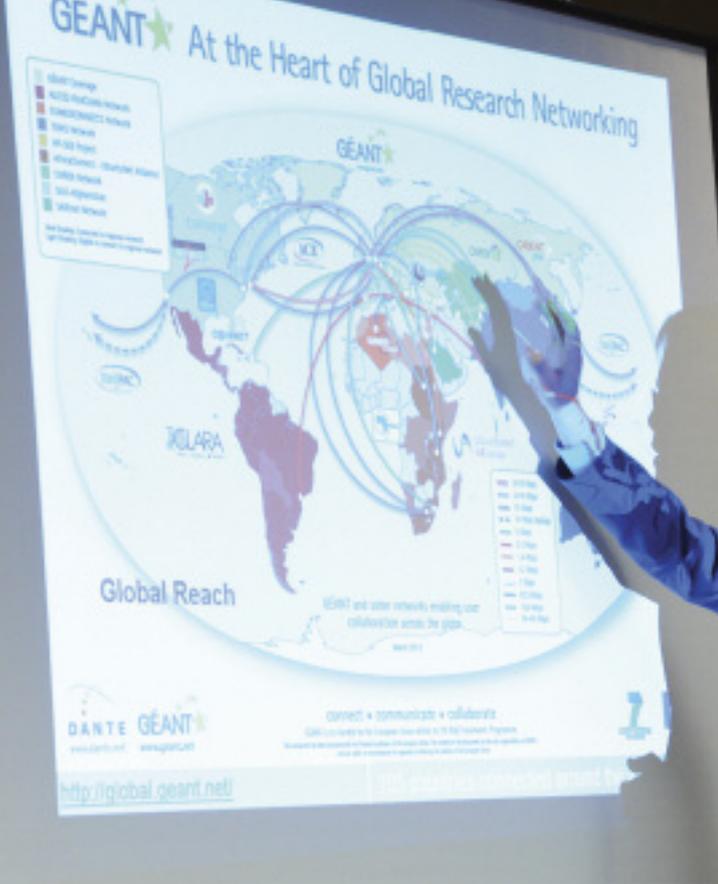
If you wish to find out more about this Dengue Fever initiative or want to join the next virtual workshop, please contact Professor Francis Lee Bu Sung at [ebilee@ntu.edu.sg](mailto:ebilee@ntu.edu.sg)



R&E networks support Dengue fever management in the Caribbean

12 June 2014, Port of Spain, Trinidad & Tobago

To find out more about this workshop visit [www.ckln.org](http://www.ckln.org)



# STRONG GÉANT PRESENCE AT INTERNET2 GLOBAL SUMMITT

The 2014 Internet2 Global Summit, the successor to the Internet2 Annual Member Meetings, was held in Denver, Colorado, from 6-11 April. With a significant number of European R&E networks in attendance, alongside DANTE and TERENA, the GÉANT community was well represented.

Internet2's Annual Member Meeting was renamed as the Internet2 Global Summit in 2014 with a view to lending greater emphasis to global interactions for the US R&E networking community, a direction emphasised by this year's attendees representing some 35 countries worldwide.

Traditionally, Internet2 Member Meetings have been well attended by the GÉANT community, not just by DANTE and TERENA, but also by an ever-increasing number of European NRENs. The 2014 Internet2 Global Summit saw a continuation of this trend with a dozen or so European networks in attendance.

Whilst the event provides an environment in which to engage in direct discussions with the North

American and wider global R&E networking communities, it also provides an excellent opportunity to promote the work being done in Europe both by NRENs and GÉANT. In Denver, attendees from European NRENs, TERENA or DANTE presented in close to ten sessions, significantly raising the profile of Europe as an important player in global collaboration, with topics ranging from the Global CEO Forum and Global Network Architecture to user support, high-quality video transmissions including for surgery broadcasts, ICT in biotechnology, trust and firewall-on-demand.

For GÉANT itself, the new format, which distributed international network sessions throughout the conference, provided an ideal platform to highlight to a broad audience the global reach (over 100 countries worldwide), wide-ranging work and high value of the European R&E Network. A one-hour net-cast presentation covered the GÉANT infrastructure and project, service developments in Europe and use cases of the network. The impact



of the presentation was reflected by Larry Gallery of NYSERNet, the New York State R&E Network, who commented, "The presentation was very insightful. I thought I had a good understanding of GÉANT's reach but after the presentation I realized the true extent of the reach and projects made possible by GÉANT – truly amazing. GÉANT is so much more than the Pan-European R&E backbone network."

For more information, visit [www.internet2.edu](http://www.internet2.edu)

**Words**  
Tom Fryer,  
Senior  
International  
Relations Officer,  
DANTE

**Picture**  
Tom presenting  
at Internet2  
Global Summit  
(top) and human  
networking with  
global partners

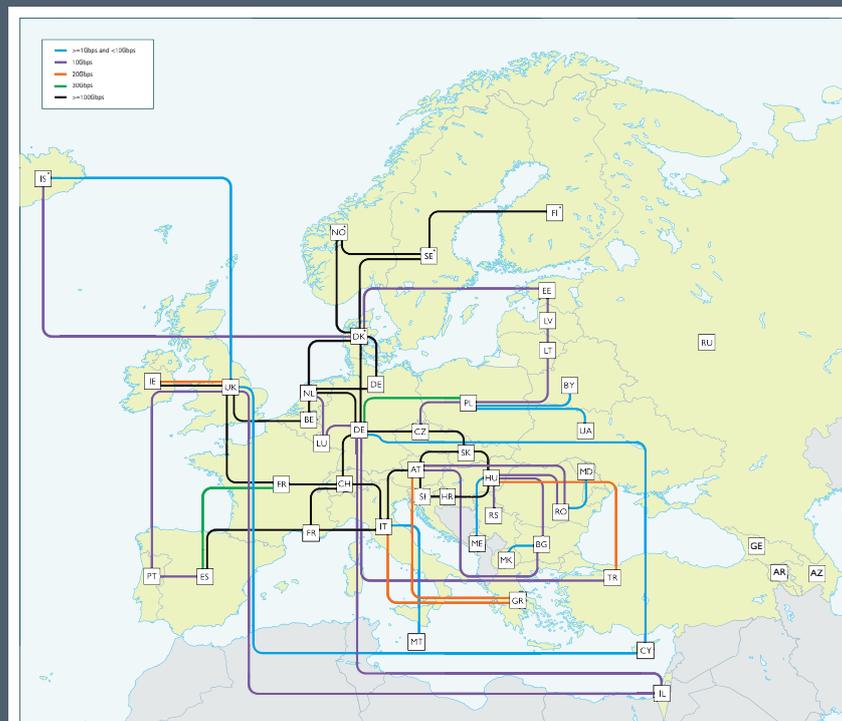
GÉANT is the pan-European research and education network that interconnects Europe's National Research and Education Networks (NRENs). Together we connect over 50 million users at 10,000 institutions across Europe, supporting research in areas such as energy, the environment, space and medicine.

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GÉANT connectivity as at January 2014. GÉANT is operated by DANTE on behalf of Europe's NRENs.



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