THE TRUST AND IDENTITY ISSUE

AARC AND EDUGAIN WORKING TOGETHER TO EXPAND FEDERATED ACCESS

EDUVPN SECURING YOUR PRIVACY ON PUBLIC WI-FI

AARC PILOTS AAI SOLUTIONS FOR RESEARCH

SURFCONEXT AND EDUGAIN CONNECTING PEOPLE TO RESOURCES WORLDWIDE

ALSO IN THIS ISSUE

CLOUD SERVICES: DELIVERING VALUE AND SAVING MONEY

CONNECT INTERVIEWS: MICHAEL FOLEY AND WACREN’S BOUBAKAR BARRY

ENGAGING WITH RESEARCH: MEET THE TEAM SUPPORTING INTERNATIONAL USER COMMUNITIES
CONTENTS

AARC AND EDUGAIN: WORKING TOGETHER TO EXPAND FEDERATED ACCESS TO ONLINE RESOURCES

EUROPEAN SPACE POLICY CONFERENCE

CONNECT INTERVIEW: MICHAEL FOLEY

CONNECT INTERVIEW: BOUBAKAR BARRY, WACREN CEO

EOSC-HUB: INTEGRATED SERVICES FOR THE EUROPEAN OPEN SCIENCE CLOUD

CLOUD SERVICES DELIVERING SAVINGS

ABOUT GÉANT

WELCOME FROM CATHRIN STÖVER

Trust and Identity are in full focus in this latest issue of the CONNECT magazine. I specifically enjoyed reading the piece about eduVPN – ultra-secure access through the quick and easy creation of an eduVPN tunnel when enjoying free Wi-Fi in a café or on a train. I was equally impressed by how the AARC project creates a blueprint architecture to ensure that multi-institutional research collaborations no longer need to develop their own AAI, thus increasing the AAI interoperability across the fields. The case studies from the CTA and CORBEL research infrastructures show impressive efficiency gains.

For the CONNECT interviews, we have had the pleasure of talking to Michael Foley and Boubakar Barry, both champions for NREN development around the world. While Michael takes a global view, Boubakar invites us to celebrate the long-awaited connectivity to West and Central Africa when the WACREN network is launched at the WACREN conference in mid-March in Togo.

And we learn from the new GÉANT research engagement and support team - meet the team around Enzo Capone, learn more about the way the team works with NRENs around the world to support a diverse group of international user projects and check out why they like spending their days in space.

I hope you enjoy this issue, which is again bursting with the diverse success stories and news of our ever growing community.

Cathrin Stöver, GÉANT
The largest European research networking conference is preparing for another inspiring community event. With its stimulating title “Intelligent networks, cool edges?” the TNC18 programme, with its sessions, demonstrations and talks will certainly get your synapses firing.

Over the years, Research and Education networks have evolved from dedicated connectivity providers to pioneeers of the net service architects and innovation enablers. Empowering future generations to shape their success and solving global challenges is at the heart of our shared mission.

TNC18 will present ideas and concepts across a variety of thought provoking sub-themes from the responsibility of sustainability and delivery, to the power of data analytics, the creation of intelligent complexity, and networking at the speed of science.

KEYNOTE SPEAKERS

Through keynote speeches TNC18 presents participants with a unique overview of the latest developments in Research and Education networking, both in the technical field and in the area of application management. Ranging from networking in extreme environments to security of connected medical implants and quantum technology, TNC18 covers a wide variety of inspiring topics by renowned experts in their fields.

This year’s keynote speakers are:

**STEPHANIE WEHNER**
Professor in quantum information at the Technical University of Delft, Stephanie is one of the founders of QIP and the leading light in the field of quantum cryptography. From 2010 to 2014, her research group was located at the Centre for Quantum Technologies, National University of Singapore, where she was first Assistant and later Associate Professor. Stephanie’s presentation will focus on the everyday research of all its research organisations and the daily work of every researcher.

**MARIE MOE**
Professor at the Norwegian University of Science and Technology. She has a PhD in information security. Her keynote address will feature live demonstrations and talks will certainly get your synapses firing.

**HELGØ STRANDEN**
Senior Advisor on ICT & HPC at UNINETT and Chair of the TNC Programme Committee, Helgø will give us an insight on the challenges faced in the deployment of optical networks for research purposes in the Nordic environments. Helgø’s keynote address will feature live footage from UNINETT’s subsea cable project where 2x270 kilometres of optic cable was laid on the seabed outside Svalbard, an arctic archipelago located between the North Pole and the North Pole.

**MEDLI KASHORDA**
Executive Director of Kenya Education Network (KENET), the largest independent research organisation in Scandinavia. Marie has also served on the board of FORUT, a multidisciplinary project which has immediately led to significant and recognisable new ideas, developments or improvements over the last 12 months.

**ALEXANDRA BECH GJØRV**
President and CEO of SINTEF, the National Research and Education Network of Norway. Alexandra has also served on the board of a range of industry, energy and media companies in Norway and internationally. Alexandra’s keynote presentation focuses on the impact of the digital transformation on research organisations and their everyday research of all its scientists and researchers.

**ANDREW WOODS**
In this year’s keynote, Andrew will explore the role of supercomputing, image processing, and advanced visualisation and history in advanced research and education. Presenting the Sydney-Kormoran Project, Andrew will provide a comprehensive overview of the key features and benefits of this project.

**INSIDE THE PROGRAMME COMMITTEE**

The TNC18 Programme Committee is an international group of experts in Research and Education networking committed to providing a forum for our community to collaborate and advance science for the benefit of all. All members had the difficult task of structuring the conference programme and designing the final sessions after co-reviewing the submitted papers online and were also faced with tough decisions due to the high calibre of all the submitted proposals, received in record number this year.

Here are some interesting facts and figures:

- 50 Side meeting requests submitted
- 20 Demonstrations submitted
- 121 Proposals for sessions / presentations submitted
- 6 Confirmed keynote speakers
- 24 Sessions created

**COMMUNITY AWARD**

The GEANT Community Award recognises for their contributions to Research and Education networking in Europe and Europe and who have immediately led to significant and recognisable new ideas, developments or improvements over the last 12 months.

**GEANT COMMUNITY AWARD**

Nominations are now open for the 2018 GEANT Community Award. The winner will be selected by a panel of judges from within the GEANT community and will be announced at TNC18.

**AWARD CATEGORIES**

The GEANT Community Award welcomes in the following three award categories:

- Initiators of significant new ideas or improvements which have had lasting impact on the organisation, project or community.
- Impactful contributors to the GEANT project or wider community activities over a sustained period of time.
- Outstanding contributors to the project or community which have immediately led to significant and recognisable new ideas, developments or improvements over the last 12 months.

**HOW TO NOMINATE**

A maximum of two submissions per person will be accepted; Nominations are being accepted, and the first two complete nominations will be taken into account. The nomination form is available online: https://www.surveymonkey.com/r/2016communityaward

Deadline for nominations is midnight CET on Friday 16 March, 2018. For more information, please visit the TNC18 website.
THE PORT HUMANITARIAN HACKATHON – SUPPORTING HUMANITARIAN INNOVATION

Complementary skills for a great cause

CONNECT meets Domenico Vicinanza from GEANT and Angela Rudin University of Exeter to learn about their project created to support the work of Red Cross International and Handicap International presented at THE Port Humanitarian Hackathon in October last year: the development of an affordable smart wobble-board for lower limb amputees.

Domenico, a physicist and sensor specialist, and Genevieve, a biomechanical and human movement scientist, combined their complementary skills and expertise when they started developing the concept for a technological physiotherapy solution for lower limb amputees. Domenico’s role was to support rehabilitation for lower limb amputees. Genevieve, a prosthetic engineer, engineered a creation for the medical profession.

Lower limb amputation as a consequence of war and conflict, has catastrophic effects in terms of an individual’s basic movements and functions, their mental and physical well-being and their societal contribution. The consequences of this terrible man-made catastrophe inspired both scientists who presented their project plan about the creation of a portable, affordable and ‘smart’ wobble-board. The wobble-board uses on-board sensors to provide visual and auditory feedback to patients that help them to re-learn to balance and start to walk on their new prosthetic limb.

In war-stricken zones around the globe the widespread presence of land mines is one of the main causes of incidents requiring lower limb amputation. One of the regions most affected is Sub-Saharan Africa, a territory featuring one of the highest densities of landmines on our planet. In order to support an inordinate number of lower limb amputees in the region, each year NGOs from around the world organise shipments of more than 5,000 prostheses tailored to the specific needs of every single amputee. Recent improvements in technology, culminating with the use of 3D printing, have facilitated the production of custom-made prostheses tailored to the specific needs of every single amputee. Paired with the high numbers of amputees requiring assistance, the territory in question features also one of the lowest densities of physicians in the world, approximately one for every 2,000 inhabitants. As a consequence, contacts between patients and health professionals are extremely limited, inevitably delaying the rehabilitation process with often devastating psychological and financial consequences for the affected individuals, their families and their communities.

A simple, but effective device

The Red Cross had issued a detailed booklet in English language with gait retraining exercises for lower limb amputees, which was an important step forward and a very useful initiative, but it required the presence of an English-speaking health professional during the rehabilitation process and constant expert supervision.

After the 60-hour Hackathon a multidisciplinary team of experts from around the world, lead by Domenico and Genevieve, developed a working prototype of a special smart wobble-board that basically brought the Red Cross booklet to life. The board is modular, flat-packable, programmable, network-enabled and shippable. The device uses real-time data collection, a process where sound is created from the patient’s performances.

The Hackathon 2017 team who worked on the wobble board prototype: Genevieve Williams (GB) Domenico Vicinanza (IT) Enrico Bassi (IT) Joe Gaylord (US) Lamia Benaouali (DZ) Joe Guarino (PT) Laura Benacquista (S2) Mauro Ai (IT) Miguel Gómez-Escolar (ES) Samuel Om (ES) Enrico Bassi (IT) Zim Hang (LS) Anas Ouali (DZ)

The Red Cross had given the device to patients to try out and start to walk on their new prosthetic limb. The board is extremely lightweight and can be transported in a suitcase. The patient performs the exercises, a customisable, audible feedback is generated according to an algorithm designed for the patient’s specific needs enabling them to follow specific physiotherapy exercises. In addition, the device has a memory card to store data and measurements related to the re-training exercises and is Bluetooth and Wi-Fi enabled, making it possible for physicians and therapists located anywhere in the world to access the data, monitor the progress of the patient, provide feedback in real-time and adjust the therapy. Thanks to network connectivity, the therapist can listen to the real-time connection and identify issues based on variations of melody patterns; whilst thanks to the local storage of data, expert professionals can access the measurements at any time from anywhere, track progress and compare performances.

The future

Combining research and education networking - for example connecting the wobble-board to a hospital or a research centre using eduroam - with expertise and remote support, would turn the smart wobble board into a powerful rehabilitation tool for isolated communities or in war-stricken zones. It could also work as a prototype for an entirely new way of approaching physical therapy. In fact the smart wobble board developed by Genevieve and Domenico’s team is at the crossroad of sciences, technology and arts/ humanities. With the use of smart sensors and networking it can enable remote support and can connect to similar devices in the same region. This revolutionary device can contribute to bringing the focus back to the patient, placing him or her at the very heart of the therapy and to making the rehabilitation process more engaging and effective for patients and practitioners.

About THE Port

THE Port is an independent Swiss non-profit association ruled by its members and based on volunteer working. It is supported via in-kind donations from CERN and the Globe of Science and Innovation for hosting the Humanitarian Hackathon.

THE Port Humanitarian Hackathon

THE Port Humanitarian Hackathon, organised by THE Port Association, hosted by IdeaSquare, CERN, with partners from non-governmental organisations, is a 60-hour brainstorming workshop devoted to humanitarian, social and public interest topics. Interdisciplinary teams of selected participants work together in the fields of communication, transport, health, science, learning, culture and data.

This unique event aims to demonstrate how fundamental science can benefit society through the creation of tangible and cost-efficient technological solutions to humanitarian issues. Challenges tackled within the hackathons result in the creation of working prototypes which are then promoted to be implemented in the field. This year the Hackathon took place on 6 to 8 October at CERN: 60 participants from around the globe, 12 mentors and field workers and 10 coaches from THE Port worked on 6 humanitarian challenges. Final presentations were delivered to an audience of 350 guests from NGOs, public and private sector, social entrepreneurs, academics, analysts and the media. The following organisations collaborated to make it happen: Zermattfilm, International Committee of the Red Cross, European Commission, Ethiopian Red Cross, IDA, Amref, Farbavision, Goethe-Institut, Geneva State University, Technologie et Innovation, University of Geneva, University of Hong Kong, University of Perpignan, University of Zagreb, War Child Norway, World of Science, and many more.

For further information on THE Port Humanitarian Hackathon 2017:
http://theport.ch/home/the-port-2017/

For the Hackathon video visit:
https://vimeo.com/239013780/8a008ab8a6

THE PORT meets Domenico Vicinanza for a great cause

In action.

Left; Final presentation. Top right; Wobble board in action. Bottom right; Domenico Vicinanza

Bottom right; Prototype: Final presentation.
The GÉANT Compendium of National Research and Education Networks in Europe (The Compendium) has, since 2001, collated information about NRENs in areas such as network, funding and services via an annual survey.

It is the result of a broad, collective effort to portray the networks of the research and education community in Europe and beyond. Almost 500 people participate in the joint effort by providing facts and figures to populate the rich and colourful picture it presents. It is then members of this same community who comment on findings via a report which is produced annually.

NRENs are a large and diverse family. Each national organisation reflects the specific environment in which it grew, with country-specific peculiarities such as the political situation, the history of the organisation and its relations with user groups, funding agencies, and the status of research and education in that country all woven into its fabric. The diversity and complexity of the NREN community can make comparison challenging, but it is the Compendium’s ambition to help provide an insight into this thriving community.

By harnessing the understanding we have of the past and current NREN landscape, the Compendium offers an informed look at ways to further support the research and education sector.

Within the NREN community it is used as a reference source; to guide strategic planning; and as support material when negotiating with national funding bodies. For those outside, this self-portrait is for anyone with an interest in the development of national research and education networks and the organisations behind them. You can find electronic copies of the reports at https://compendium.geant.org “Download Print Edition” button.

The site is very much in development and we are keen to gather feedback on it so please get in touch if you have any thoughts at info@geant.org.

Words
Sabrina McCollum, Community Research Officer

"The Compendium is a living picture of what we, the NRENs, do every day to meet our users’ requirements and help them in their research, teaching and learning activities.”

adds Elis Bertazzon of GARR.

What is the data showing?
Taking into account the latest survey which closed in December 2017, the stories emerging are positive. The picture is clearly very different in the different countries and regions but we are broadly seeing an increase in budgets and personnel, the diversification of the NRENs’ user base and service portfolio, and growing network usage.

For example, the number of schools connected to NREN networks surged by 28% from 25,460 (2016) to 32,543 (2017). In addition, it has been noted that where a local NREN’s acceptable usage policy allows it to connect, the number of government institutions grew by 75% and for-profit organisations by 57%. In terms of what additional connectors means for the network, over half of the NRENs who responded forecast the average traffic growth to be circa 49% by 2020 – with schools coming out at 61% expected growth.
Raimundas joined the Kaunas University of Technology as a full-time network engineer in July 1997 and soon became responsible for high-capacity switching and routing in the Lithuanian NREN LITNET. He currently heads the computer network centre, in charge of coordination of the LITNET programme and the university network and services. Being deeply involved in the creation of long-term plans, he is directing efforts towards optical communications, future networking, open architectures, open network technologies, federated use of network infrastructure, and integrated radio access. Raimundas is the Chair of the GEANT Programme Planning Committee (GPPC).

Raimundas, what is the main purpose of the GPPC?

The GPPC is a committee of NREN representatives elected by the General Assembly (GA). For me, the committee’s responsibilities could be summarised into two main points: to provide guidance and assistance to the GEANT staff in planning and writing the project proposals to the EC and to balance the NRENs’ position within the GEANT programme as a whole and within each project in particular. Ultimately, the value of the GPPC lies in the transparent and inclusive planning within known budgetary limits. Currently GEANT activities are not limited to the “flagship” GN4 project, but include other activities involving the European research e-infrastructures, most notably the European Open Science Cloud (EOSC).

What is the GPPC working on now?

Currently the GPPC is deeply involved in the preparation of the GN4 successor project proposals with the aim to maximise coherency of activities and accuracy of resource planning. Nevertheless, the committee is also looking at other Horizon2020 projects calls. The NRENs are also involved in many parallel activities and have expressed their interest in a variety of initiatives that cannot be covered by the GN4 project alone.

Can you describe the process the GPPC is taking as it plans for a GN4-2 successor project?

There will be two GN4-2 successor projects: a “normal” (GN4-3) project with activities and tasks, and a separate proposal for EC-funded network infrastructures, currently known in the community as the RIU (or SGA-3b) proposal. The process has three parallel tracks: definition of GEANT network strategy, estimation of infrastructure deployment feasibility, and planning of GN4-2 successor activities and tasks. The process is defined by the timeline of the decision points that will be discussed during the meetings of the Board of the General Assembly (GA). For the “normal” GN4-3 project the planning process is an iterative community consultation. Currently the GEANT community experts have prepared their views of the proposed operational directions in white papers apportioned to seven specific thematic areas. The open consultation with NRENs has already started and has produced the initial indication of the priorities that will be taken into account in the actual composition and budgeting of the proposal.

What is your main area of responsibility on the GEANT Board?

As you know, I am in a special position as an elected member of the GEANT Board and head of the GPPC, so whilst wearing both hats, I can objectively say that the GPPC and the Board have so far established positive understanding and communication flows. I think that receiving regular updates on the Board’s interaction between the EC and the players of the EOSC arena, as well as guidance in the definition of the various activity areas’ operational strategies, would definitely ease the work of the GPPC. My vision of the interaction between the GPPC and the Board is based on a mutual and continuous exchange of strategic guidance. According to new terms of reference submitted to the GA, the GPPC reporting line and liaison with the Board will soon be formalised and the GPPC will report directly to the CEO. The GPPC has been constituted from elected NREN members in order to give NRENs the opportunity to input into the GEANT planning process. The interaction between NRENs, the CEO and the Board, operating in a fast-changing environment, is a balancing act that requires continuous adjustments, and as a keen cyclist, I am very aware of this requirement.

How do you think the Board can best support the work of the GPPC?

Continuing our series of Board member interviews, CONNECT spoke to Raimundas Tuminauskas, Head of the LITNET computer network centre in Lithuania, and GEANT Board member since 2015, about the GEANT Programme Planning Committee (GPPC) and his hopes for the GEANT Board.

Being deeply involved in the creation of long-term plans, he is directing efforts towards optical communications, future networking, open architectures, open network technologies, federated use of network infrastructure, and integrated radio access. Raimundas is the Chair of the GEANT Programme Planning Committee (GPPC).
NEW AMSTERDAM OFFICE FOR GEANT

Following the relocation of the GEANT Amsterdam office in December 2017, February’s GEANT Board meeting offered the perfect opportunity to mark the office opening in style!

Board members, GEANT staff and many invited guests enjoyed a great informal evening with welcoming words from Chair of the Board Christian Grimm and Interim CEO Erik Huizer.

The new office is well located in Amsterdam-Zuidoost, Bijlmer, and for our growing Amsterdam based staff the modern open space located right opposite the Bijlmer ArenA train station brings a collaborative and exciting feel. For visitors and staff traveling between offices, it also offers fast and easy transport connections to Schiphol airport.

Our new address is: GEANT Hoekenrode 3 1102 BR Amsterdam The Netherlands

GÉANT CLOUD SERVICES: YEAR IN REVIEW

Andres Steijaert, GEANT Cloud Services Activity leader, looks back at the successes of 2017 and forward to 2018.

The New Year is traditionally a time for reflection. On the year gone by of course, but also with a view toward the future.

The GN4-2 Project’s Joint Research Activity for Cloud Application Services Delivery Development (JRA4) has had a very active year and recorded a number of significant achievements. Building on work carried out previously, the team has continued to expand the NREN collaboration on clouds and strengthen GEANT’s position as an efficient service delivery gateway and single route to market.

During the year, the first version of the service delivery channel was applied and 25 new services were added to the GEANT cloud service portfolio. These include IaaS services, private cloud file storage products, and web-conferencing and video-conferencing offerings.

IaaS tender

The IaaS tender was perhaps the most significant achievement. 36 NRENs participated in the tender. 27 NRENs activated a delivery role (Referrer, Reseller and/or Underwriter) and now use the GEANT cloud support resources. 18 NRENs have been allocated 9 man-months of GEANT funding to deliver the IaaS portfolio in their countries via many avenues. 16 NRENs have organised national cloud events related to the IaaS portfolio. This investment has delivered the goods. Here are some highlights:

- 56 institutions from nine countries use cloud services via the IaaS offering: Croatia, Denmark, Iceland, Luxembourg, the Netherlands, Norway, Portugal, Spain and Sweden.
- A community of NREN cloud delivery managers (CCM) and support team members numbers

125. The community manages meetings, seminars, workshops, weekly conferences, an active e-mail list, a public clouds website and an intranet workspace for information sharing.
- Tailor-made offerings for use below national tender thresholds were also negotiated with file storage providers Nextcloud and ownCloud.
- JRA4 teams are developing components for open source video-conferencing infrastructures based on the 2016-2017 tender. This tender evaluated multi-tenant on-premises solutions in managed and unmanaged scenarios. The vendors selected are available for 43 NRENs in Europe, plus NORDUnet and GEANT.

While the achievements are impressive and met, or exceeded, all goals and KPIs, the teams are already busy on the next steps.

Looking to 2018

This year, plans are already underway to ensure the portfolio’s General Data Protection Regulation (GDPR) compliance. In addition, work continues to further develop and improve the delivery platform, to make it as easy as possible for institutions to use the available services.

Additions to the portfolio itself are also planned. In the area of educational services, priorities are to assess the feasibility of running a pan-European call-for-competition (tender) for Virtual Learning Environments (Learning Management Systems). In the area of web- and video-conferencing the team will evolve the STUN/TURN server backend infrastructure, launch the WebRTC based front-end client and establish monitoring and statistics modules.

Whilst the consensus is clear on how cloud services empower institutions to obtain the IT services they need in an easy, intuitive and cost-effective way, migration is still a daunting task for many. Thanks to the GEANT cloud offering, NRENs are more agile and uniquely able to offer a wider range of services, priorities are to assess the feasibility of running a pan-European call-for-competition (tender) for Virtual Learning Environments (Learning Management Systems). In the area of web- and video-conferencing the team will evolve the STUN/TURN server backend infrastructure, launch the WebRTC based front-end client and establish monitoring and statistics modules.

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Whilst the consensus is clear on how cloud services empower institutions to obtain the IT services they need in an easy, intuitive and cost-effective way, migration is still a daunting task for many. Thanks to the GEANT cloud offering, NRENs are more agile and uniquely able to offer a wider range of relevant services at a faster pace than commercial providers in order to facilitate the dynamic collaboration that academic research needs. We are now seeing NRENs maximizing the benefits of the single digital market for their institutions to ensure best-value services. Stay tuned for more updates!

For more information on the GEANT Cloud Services Activities visit https://clouds.geant.org

Picture Andrea Steijaert presenting at DI4R 2017
QQI – Quality and Qualifications Ireland is an independent, State agency responsible for promoting quality and accountability in education and training services in Ireland. Established in 2012, their mission is to promote the enhancement of quality in Ireland’s further and higher education and training, and quality assure providers; and to support and promote a qualifications system that benefits learners and other stakeholders.

QQI needed to improve a vital, mission-critical legacy application that was operating on outdated hardware, inefficient software and overweighted databases. The application was highly visible, spanning multiple systems, educational course information, public data and a high traffic public interface.

QQI decided to move away from the costly data centre-based solution and embark on a gradual migration of the application to the cloud with Microsoft Azure, alongside the adoption of Office 365. The Azure model gave them the flexibility and scalability they needed.

While the software application remained the same QQI was able to refine and gradually upgrade components, move from a single front-end to three, and manage the significant peaks and valleys in capacity demand.

QQI evaluated more methods to simplify infrastructure and support models, and to reduce costs. The launch of the GEANT IaaS Cloud Framework in 2017 brought even more advantages.

HEAnet helped QQI realign their existing contractual arrangement with Microsoft. Using GEANT’s framework agreement brought significant cost savings, through usage discounts and data traffic arrangements.

Microsoft’s licensing plans were further optimised by transferring existing on-premise educational license agreements into the Azure cloud. The ‘Bring Your Own License’ element of the GEANT framework, which Microsoft offers through their Azure Hybrid Benefit programme, helped maximise value from existing server licenses.

Lessons Learned
QQI’s use of the GEANT IaaS framework, with usage discounts, reduction of data traffic costs and transfer of existing on-premise server licenses, brought the actual total costs down by 33%. With the deployment of other services on Azure, the cost savings are probably even higher.

NREN Support
HEAnet played an important role helping QQI maximise the GEANT framework. HEAnet is more than just QQI’s connectivity provider; they are considered a trusted advisor. “Using GEANT’s framework agreement with Microsoft brought QQI significant cost savings,” says Gavan McFeely, HEAnet’s Brokerage Services Manager. “Usage discounts and data traffic arrangements led to a significant reduction in costs.”

“After moving 98% of our infrastructure in Azure, we don’t have to worry about the physical hardware and administrative and contract costs are much lower. Taking all this into consideration, the value of HEAnet facilitating our migration to the cloud is really immeasurable.”

Dr. Ray O’Neill, Head of ICT and Procurement

About Microsoft Azure
Microsoft Azure is the perfect choice for research and education. It allows swift and easy access to very powerful computing environments where complex data can be analysed, stored and shared efficiently and securely. It also gives researchers access to tools which can turn data into insights and enable them to collaborate with others quickly and securely to accelerate discovery. Coupled with the benefits of the GEANT Framework, Microsoft Azure and Hybrid use benefits along with reserved instances provide education customers with the lowest pricing and cost flexibility when moving mission critical workloads or an entire DataCenter to Microsoft Azure.

Further information
To contact a Microsoft Approved Partner to find out more about Microsoft Azure on the GEANT Framework, visit the Clouds Catalogue at https://clouds.geant.org/IaaS/Azure

Picture
Image courtesy of Microsoft
To manage access to all these resources, institutions and research collaborations need a way to digitally identify their users. Once they know who is who, they need to give the right users access to the rights tools, data and resources. This relies on Authentication and Authorisation Infrastructures (AAIs).

However, nationally-based institutions and international research collaborations have different AAI needs and challenges. And these are being addressed through the eduGAIN service and through the AARC project respectively.

How does eduGAIN address the AAI needs of institutions?

Many research and education institutions provide their users with a single online identity. This gives users access to all the services that are available locally within the institution. To bring together a wider pool of users and services, preservation of data privacy. The individuals within these groups may be in different institutions, countries or continents. Such collaborations function as virtual communities or organisations, which must offer and manage services for their members. Typically, services are delivered based on ‘membership’ information rather than on which institution a researcher is affiliated with.

Who endorses AARC policies through AEGIS (AARC Engagement Group for infrastructures)?

AARC relies on the federated approach and infrastructure championed by eduGAIN and its participating national federations. AARC expands the adoption of federated access to services in a more granular and flexible manner: researchers can log in using their own institutional identity while membership to different research collaborations is managed in line with AARC guidelines. So AARC means that research collaborations need spend less time and money on reinventing the AAI wheel, and it provides more connections between solutions and between research communities. This all means safe and more reliable access for more researchers to more services, data and software. So researchers can focus on research.

How does AARC address the AAI needs of research collaborations?

While eduGAIN primarily operates at an institutional level, research fields are typically structured in a different way, with researchers organising themselves into collaborative groups driven by common research goals and grants. The AARC project respectively.

The AARC (Authentication and Authorisation for Research and Collaboration) project is creating a common AAI framework - one blueprint architecture, one set of policies and one collection of training materials that should work for all research collaborations. AARC is also working with research collaborations to pilot and improve specific technical and policy aspects. AARC relies on the federated approach and infrastructure championed by eduGAIN and its participating national federations. AARC expands the adoption of federated access to services in a more granular and flexible manner: researchers can log in using their own institutional identity while membership to different research collaborations is managed in line with AARC guidelines. So AARC means that research collaborations need spend less time and money on reinventing the AAI wheel, and it provides more connections between solutions and between research communities. This all means safe and more reliable access for more researchers to more services, data and software. So researchers can focus on research.

Who endorses AARC policies through AEGIS (AARC Engagement Group for infrastructures)?
In December an AARC pilot was set up to improve the CTA AAI service using elements of AARC’s blueprint architecture. This will expand capabilities to secure CTA resources and digital assets through role-based authorisation, and allow federated authentication based on a central SAML (Security Asserion Markup Language) service and on sub-SAML. The first release is planned for the summer of 2018. “The AARC blueprint architecture, as well as being an architectural design, represents the possibility for us to speak with other technological partners using a common language that describes AAI and its complex world,” says Alessandro Costa.

Another advantage for CTA in joining forces with AARC is the opportunity to be part of a large community and witness the development of AAI for a wide set of requirements. “This allows us to observe real world implementations and their advantages and disadvantages,” concludes Costa.

Life Science – a single platform for CORBEL

CORBEL is an initiative of 13 biological and medical research infrastructures, which aims to create a platform for harmonised user access to biological and medical technologies, samples and data services. In 2017 they called e-infrastructure organisations to propose and operate an AAI solution that would work for all of them, to ensure a sustainable and cost-effective way for researchers to access life science services.

A pilot with the life science community was already planned in AARC and some science research infrastructures had joined the AARC project and acted as liaison points with the rest of the CORBEL life science infrastructures. The e-infrastructure providers EGI, EUDAT and GEANT were also represented in AARC by a number of partners. So it was obvious to pilot an AAI solution for CORBEL based on the blueprint and the AARC partners.

“December was chosen as a convenient time to launch the pilot to show how their services are harmonised and to provide technical integration of identity providers and service providers. In particular, this phase improves security and trust and provides security incident response capabilities,” says Costa.

This was the first time that a cluster of different research infrastructures active in the same field agreed on their AAI requirements and called for the e-Infrastructures to deliver an AAI solution. This was also the first time that EGI, EUDAT and GEANT collaborated to deliver and jointly operate a customised, discipline-specific AAI.

The AARC pilot uses existing infrastructure components, which is in line with the project’s approach to take advantage of existing solutions as ‘building blocks’ to achieve higher benefits. The pilot has been structured in three phases:

- Phase 1: December - end January 2018 - bootstrapped the AAI solution by putting together and defining the user registration process, attributes required by service providers and the authorisation flow.
- Phase 2: February - end May 2018 - aims to operate the dedicated AAI components according to the agreed service level and to provide technical integration of identity providers and service providers. In particular, this phase improves security and trust and provides security incident response capabilities.
- Phase 3: will consider all aspects of sustainability and drive the pilot to full production and operation.

AARC is organising a specific training module for life sciences service providers that will show how their services are connected to the AAI and guide them through connecting their services. This training is scheduled to be available from the end of April and will help life science communities to better understand the AARC Life Sciences pilot’s achievements.
Since its inception 10 years ago SURFconext, the Identity Federation of The Netherlands, has been helping students, teachers and researchers to connect to a wide range of systems and resources, not only in The Netherlands but, thanks to eduGAIN inter federation, around the world.

Last year SURFconext enabled over 90 million log-ins from more than 1,300,000 unique users across 154 Identity Providers. With almost 1,500,000 potential users in the Netherlands nearly 93% of the student and researcher population are now able to use SURFconext. Not only are the number of users continuing to grow but the number of affiliated services is also on the increase. With 730 connected services, SURFconext grew strongly last year. There were a number of reasons why 260 new services joined:

- a large number of senior secondary vocational education (MBO) institutions started using SURFconext;
- there was a sharp increase in connected electronic learning environments and many new international services were linked by means of eduGAIN.

For these reasons, the number of Service Providers connected in 2017 increased by more than 56% compared to 2016.

Strong Authentication growing explosively

Many institutions rely on SURFconext to enable their users to securely log in to cloud services. Using SURFconext Strong Authentication, this can be done even more securely. In 2017, it also became possible to link services that are not connected to SURFconext to Strong Authentication. The second factor is used to complement an existing service within the institution that is not linked to SURFconext. As a result, usage increased explosively from around 1,000 logins per quarter via Strong Authentication in early 2016 to over 165,000 in the second quarter of 2017.

This ability is a very strong selling point for SURFconext in the R&E sector as concerns grow about security and data safety on-line.

As Arnout Terpstra, Product Manager at SURFconext, explains: “SURFconext and eduGAIN provide a reasonably strong level of assurance within the Service Provider community because the underlying identities have been authenticated by the original ‘home’ institutions and are up-to-date (unlike a ‘self-declared’ identity through a public website). In the era of fake news and fake users this assurance is very important to Service Providers. Strong authentication provides even greater assurance for Service Providers particularly when accessing sensitive data or services.”

Ease of use is key to adoption

SURFconext uses the hub and spoke model for its Identity Federation. This makes the connection between an IdP and Service Provider a simple point and click action using the SURFconext IdP dashboard. Again this simplicity makes SURFconext extremely popular and cost-effective for Service Providers and IdPs alike which underscores the extremely high adoption rates and growth.

SURFConext - looking forward with eduGAIN and AARC

Federated Identity management makes collaboration across R&E simpler – particularly international collaborations - and it is for this reason that SURFconext is an active participant in international projects such as AARC as well as being a key participant in GÉANT’s Trust and Identity activities. The AARC project is designed to closely collaborate with existing research collaborations and e-Infrastructure providers to help develop identity policies and technical frameworks based on actual community requirements. This benefits research collaborations worldwide by producing unified policies and technical frameworks between users and services whilst still meeting the needs of security and privacy.

With Federated Identity becoming an essential component of national and international collaboration and the growth in acceptance of these technologies both in R&E and across the commercial sector, it looks like SURFconext will have another busy and exciting 10 years ahead of it.
EDUVVPN – SECURING YOUR PRIVACY WHEN YOU ARE OUT AND ABOUT

Many of us enjoy taking our smartphone or laptop down to our local café, grabbing a cup of our favourite hot beverage and sitting down to surf the web. Free Wi-Fi is no longer a luxury but an essential commodity when on the move. But are you actually aware of how vulnerable you are when you are using a public Wi-Fi hotspot?

Wi-Fi convenience vs security

Most Wi-Fi networks that are created for home and business use are password-protected and encrypted. However, most public Wi-Fi hotspots are set up strictly for convenience, not security! When you are using an unprotected public hotspot, whatever you do online is potentially open to the eyes of prying hackers. If you allow file-sharing across such a network, hackers can easily plant infected software on your computer.

eduVPN – a shield to protect your privacy

As public Wi-Fi becomes increasingly common, you can expect risks to grow over time. But this doesn’t mean you have to stay away from free Wi-Fi and tether yourself to a desk again.

A group of developers from across research and education have joined forces to develop eduVPN, a technology for ultra-secure access, designed for the research and education community. VPN stands for Virtual Private Network, and by using eduVPN a tunnel is created that shields your data traffic from prying eyes, even when you are in your favourite café or riding the train.

“Through the eduVPN app, students and researchers can access their applications and resources from anywhere, without having to worry about security,” explains Tangui Coulouarn, chair of the eduVPN board and project manager at the Danish e-infrastructure Cooperation (DeiC).

He is developing eduVPN jointly with colleagues from Australia (AARNet), The Netherlands (SURFnet), as well as the Nordics (NORDUnet), and GÉANT. He hopes the novel privacy technology will spread as widely as eduroam, the secure, worldwide roaming access for research and education.

The next steps - federated VPN usage

But that’s not all. The eduVPN development team has another ambitious goal in mind – a federated VPN model.

Just like eduroam provides federated trust between users from other institutions then eduVPN can leverage this same level of trust to offer a distributed VPN service. This would provide secure eduVPN gateways that end-users can access when using unsecured networks. By separating the ownership and operation of the gateways from the operation of user identity components using eduGAIN federated identity, eduVPN offers privacy-by-design in a way that is not attainable by other commercial VPN operators. Users can then select which eduVPN gateway to use to best suit their requirements and location.

Success depends on universities

Ultimately, the success of eduVPN will depend on securing a critical mass of R&E networks that incorporate the technology in their service offering, and on universities using it to connect students and staff to campus resources.

SURFnet is the first NREN to deploy eduVPN, starting 1 January 2018. NORDUnet is running a test application, and the other eduVPN partners are preparing deployments in the near future.

eduVPN has recently become an official part of the GÉANT (GN4-2) Project, and has received financial support from the Vletsch Foundation, the SIDN Fund, RIPE, NORDUnet and SURFnet. Also, eduVPN recently won the Internet Society of the Netherlands’ “Innovation Award 2018.”

To find out more and to take part visit the eduVPN website at www.eduvpn.org
CONNECT catches up with Vincenzo Capone, Head of the newly formed GEANT Research Engagement and Support Team, to talk about the work carried out by his group to support international user organisations, their networks and associated service requirements.

**Focus on: GEANT Research Engagement and Support Team—Supporting International User Communities**

Enzo, what is the rationale behind the creation of this new team?

At GEANT, we have always worked closely with our NREN partners to support international users and cater for their varied and complex requirements. The recent creation of a Community Support function within GEANT is enabling us to address, in a more structured manner, the needs of GÉANT in enabling us to address, in a more structured manner, the needs of GÉANT's organisational requirements. The recent creation of this new team aims to provide a coherent, pan-European response to user needs. The commercial management function provides a streamlined, professional approach to the support of research communities, coupled with the commercial management team.

**What is the remit of your team?**

We work on behalf of GEANT’s European NREN partners and endeavor to provide a streamlined, professional approach to the support of research communities with an international presence. The team’s service offering focuses around three main areas: account management, technical customer support, and commercial management. The account management function ensures that a single point of contact for project management purposes, takes responsibility for the technical and commercial support to the communities and projects, and the proactive anticipation of the user organization’s needs. The technical customer support aims to provide the best services based on the knowledge and understanding of the user’s requirements. The commercial management endeavours to provide a coherent, pan-European response to commercial enquiries.

**How do you engage with users?**

The team has devised a process that follows specific steps: requirement gathering, design, proposal, implementation, operation, support. Interactions between users, account managers and a lead NREN define the potential service required - the NREN is typically designated according to the country where the headquarters of the user organization reside. For the design phase, the team develops a technical proposal that includes an overview of the solution’s development, operation and support to its communities.

**Health and Food**

Pharmaceutical research, EMBL, EBI, Human Brain project, ARES have all involved have been assessed through our account management and support to their communities.

**Physical Science**

Exploring the universe and cornerstones of our existence, we’re assisting the likes of SKA, JME, NEXIPReS, LIGO-WHIO and CERN.

**Overview of research areas and organisations supported by the Research, Engagement and Support Team**

**Energy**

Nuclear power, future energy research, anything to do with the science behind the juice that keeps the lights and computers turned on around the world. We work directly with ITER, for example.

**Earth and Environmental Sciences**

Earth observation, climate monitoring, water quality, volcanoes, and sustainable development. These are some of the subject areas that we cover while assisting organizations such as Group on Earth Observation, WMO, ESA and EUMETSAT. We are the primary partner in the RSE community of the COPERNICUS project.

**Social Sciences**

Music, art, languages. We’ve worked with the likes of CLARIN, ASTRA and Lola to cater for their specific requirements.

**e-Infrastructures**

We also assist and provide services to the infrastructures who deliver complimentary services to research communities: PRACE, EUDAT, EGI and others.

**Meet the Team**

**Vincenzo Capone, Head of the Research Engagement and Support Team**

Prior to joining GEANT, Enzo worked at the Department of Physics of the University of Naples, where he was the network architect and manager in charge of computing for physics experiments. He was also Technical Associate to the ATLAS experiment collaboration at CERN and to the National Institute for Nuclear Physics (INFN).

**Richard Hughes-Jones, Senior Network Advisor**

Richard is the network architect in the SKA Signal and Transport consortium with responsibility for the long haul data transmission within the telescopes and the connectivity of the telescopes to the world-wide academic networks. He worked on the ATLAS LHC experiment at CERN and is the area director for infrastructure in the Open Grid Forum (OGF) and a co-chair of the Network Measurements Working Group.

**Domenico Vicinanza, Senior Research Engagement Officer**

Domenico is a Senior Lecturer in Electronics at Anglia Ruskin University in Cambridge, where he leads the Intelligent Systems, Software Engineering and Game research group. In addition to a PhD in physics, he also holds a degree in orchestration for cinema and television and is a qualified Argentine tango instructor. As a musician, he has worked with CERN and NASA using music to communicate science.

**Chris Atherton, Research Engagement Officer**

Chris has over 10 years’ experience working in the IT and Space industry and holds a BSc (Hons) in Computer Networks and Security. He joined GEANT in 2017. In his spare time, Chris used to send balloons to the edge of space; a hobby that soon became a small business. Chris’ fascination with Space started in his infant school days.
The dust has settled after the New Year’s celebrations as everyone is getting back to work in earnest for 2018 and for the space industry this is no different. Every year in the third week of January, the Annual Conference on European Space Policy takes place in Brussels. Here, around 1,000 industry representatives and high level invited guests set out their stalls to the European Commission and the world. This is the conference that sets the tone in the European space industry for the year. Given the disruption that the UK Referendum could cause and the new Multiannual Financial Framework (MFF) being worked on by the EC and the European Council, this year’s conference had a funding theme weaving its way through the vast majority of the speeches.

But why was GEANT there?
Strategically, the data derived from space is one of the important growth areas for GEANT. Both in terms of the network traffic passing over the backbone, but also the trust and identity services that allow researchers and researchers accessing the data to do so easily. Last year over 13 TB of data per day passed across the GEANT network for the Copernicus programme alone. And with ESA planning to launch 28 earth observation satellites over the next few years, it is expected that this stream of data will increase at an exponential rate. As such, space organisations are one of the focus areas for the research engagement and support team within the GN4-2 project (NA3 T2).

Words
Chris Atherton, Research Engagement Officer, GEANT

Two of GEANT’s biggest non-NREN users, ESA and EUMETSAT, account for the vast majority of the current space-derived traffic on the GEANT network. Their presence at the conference offered the perfect opportunity to gain a good understanding of where this industry is heading and to make contact with people in this sector. I had the privilege to meet the new ESA Astronaut Head of crew office, Tim Peake; the ESA director of the Galileo programme, Paul Verhoef; Martin Dittrich, policy officer for DG GROW specialising in space data (Copernicus); and Cristina Martinez, deputy Head of unit at infrastructures and open science cloud from DG-CNECT. The event offered also an opportunity to talk about the European Open Science Cloud and the OCRE project focusing on the Earth Observation industry.

Key messages from the conference were that 5G is now a big focus for the space telecoms side of the industry as well as quantum computing and communications from and to satellites. Defence research is a new focus area along with the announcement that a new space policy is to be developed for the EU over the next few years with dedicated funding from the EC.

Working with NRENs to meet data protection regulation requirements

The objective of TF-DPR is to gather information, discuss and develop tools and best practices to be able deal with the requirements of data protection regulation, with a focus on the General Data Protection Regulation (GDPR) and how National Research and Education Networks (NRENs) and GEANT’s shared services can prepare for its introduction. The Task Force aims at collaborating on the implementation of the GDPR and other privacy regulations in the following ways:

- To build up a trusted forum with members who actively participate and are involved in the results of the Task Force.
- To provide a platform to promote the sharing of best practices, tools and policies related to data protection and privacy regulations.
- To discuss, share ideas and give feedback that lead to a better understanding of the privacy regulations. Shared opinions can result into policies that provide guidance.

The Task Force aims to gather individuals, within the GEANT community, such as legal privacy experts and privacy officers who are working on data protection regulation within their organisations. The outcomes of this Task Force will be shared with the wider GEANT community.

Steering Committee
Chair: Mørtens Ege Ejrnæs Nielsen – DeiC
Members: Evelijn Jeunink – SURFnet
Andrew Cormack – Jisc
David Foster – CERN
Pål Axelsson – SUNET
Secretary: Charlie van Genuchten – GEANT
Charlie.Genuchten@geant.org
Mailing lists: tf-dpr@lists.geant.org;
ta-legal@lists.geant.org
His recent retirement has not abated exchange in the developing world. As enabler of learning and knowledge the transformational effect of NRENs the World Bank in Washington DC, Lead Distance Learning Specialist with effectiveness and accessibility. As how ICT can transform education’s has been an enthusiastic explorer of advantaged. This sentence in Michael to knowledge and learning to those less and using ICT tools to provide access to knowledge and learning to those excluded. This has been an enthusiastic explorer of tools could open access to education eighties that led me to see that these of satellite broadcasting in the mid an opportunity to explore the potential of satellite broadcasting, videoconferencing, early web support tools, virtual classrooms etc. Applying that experience at the World Bank from 1997 led to the Global Development Learning Network (GDLN), a partnership programme with learning centres in developing countries. We used satellite links (VSAT) due to poor telecoms infrastructure in the Bank’s client countries. Our pedagogical design called for two-way videoconferencing into that area the funding was aimed at the digital revolution in education in developing countries had a greater chance of success in higher education. It was also was more vital there too. When the Bank projects eventually moved into that area the funding was aimed at improving the quality of teaching and the stimulation of research - two goals where connectivity was vital. So I jumped in and tried to persuade the project managers that NRENs were the way to manage the connectivity, and that support for them should be part of these projects. In another part of the Bank operations, in ICT and telecoms, we did similar, you could say, “lobbying.”

In parallel to that effort we ran a number of GDLN knowledge sharing programmes to raise awareness among decision makers in some countries on the benefits of NRENs. Our most successful effort, I believe, was the SERENE programme (South-south Exchange of Research and Education Experiences). All World Bank lending is based on requests from client countries, and so it was important that the key decision makers participating in the study programme could see for themselves the benefits and workings of NRENs in similar countries. My aim at the end of the programme, a mix of videoconferences, web and a study tour, was for the ministry and university management people to say “I want one of those” And we largely succeeded. After the NRENs of Pakistan, Sri Lanka, Thailand and Vietnam generously shared their experiences, Bangladesh now has BREN, Bhutan has DrukREN, and Afghanistan has AfgREN.

Tell us more about your background and what attracted you to the world of NRENs.

I’ve worked all my life as an educational technologist, first in University College Dublin (UCD) and later at the World Bank Institute in Washington DC. It was an opportunity to explore the potential of satellite broadcasting in the mid eighties that led me to see that these tools could open access to education and knowledge for those excluded. That led us into collaborative R&D programmes, funded by the European Union, that researched a whole range of technologies in what became known as “blended learning”, satellite broadcasting, videoconferencing, early web support tools, virtual classrooms etc. Applying that experience at the World Bank from 1997 led to the Global Development Learning Network (GDLN), a partnership programme with learning centres in developing countries. We used satellite links (VSAT) due to poor telecoms infrastructure in the Bank’s client countries. Our pedagogical design called for two-way videoconferencing because of our audience (mainly senior civil servants) and the emphasis on knowledge sharing between countries. But this required decent bandwidth and we also wanted to reach beyond capital cities. Therefore NRENs made excellent partners.

How did you sell NRENs to your World Bank managers?

The World Bank’s lending programmes in education were at one time mostly concerned with basic education. Therefore much of the discussion of ICTs in education was in relation to secondary education. However, I believed that the digital revolution in education in developing countries had a greater chance of success in higher education. It was also was more vital there too. When the Bank projects eventually moved into that area the funding was aimed at improving the quality of teaching and the stimulation of research - two goals where connectivity was vital. So I jumped in and tried to persuade the project managers that NRENs were the way to manage the connectivity, and that support for them should be part of these projects. In another part of the Bank operations, in ICT and telecoms, we did similar, you could say, “lobbying.”

In your view, what are the main challenges NRENs face?

They need to get government support, and in turn, donor support if necessary. Their biggest challenge is lack of awareness and understanding of what an NREN does and how it is different from commercial ISPs. Therefore raising awareness is vital. It is also important to show that an NREN exists in a global ecosystem, a “grand club” if you will, that brings with it ready made access and inclusion in global partnerships that help to alleviate academic isolation. In addition, and while it may have little intellectual rigour, the argument that “everyone else is doing it” is quite persuasive. In making their case NRENs should argue that connectivity is an integral part of the infrastructure of the public good that is education and health. To be sustainable does not mean that it has to fund itself by fees alone. NRENs need the courage to ask for government support.

What is your fondest memory of working with NRENs?

Working on the SERENE programme – the goodwill in the NREN community for emerging NRENs that was demonstrated there was inspiring. Governments should know that this help is available.

What is on top of your wish list when it comes to connecting the world?

That decision makers who can make things happen are fully aware of the need for NRENs – that they ‘get it’. Not enough of them get it – there’s work to be done!

Finally, is there any advice you can give to the GEANT community – what can we do better?

Your “Case for NRENs” website is excellent. It would be useful to add an update and global version of the GEANT Compendium. And maps – maybe a global map in the style of the GEANT connectivity map. On this advocacy side you could lobby with donors for a global trust fund to help emerging NRENs.
Providing high-capacity internet and services for research and education in the European Eastern Partnership (EaP) region is a key focus of the EaPConnect project. But EaPConnect also stimulates collaboration between EaP researchers and educators and their peers in Europe. In 2017, the project partnership grew to eighteen NRENs, including six main project beneficiaries. Relationships between them continue to develop and bring new opportunities for cooperation, as six partners explain:

**AMRES (Serbia – associate partner)**

Milos Cvetanovic, Director

“Opportunities to collaborate, share knowledge and experience are extremely helpful and can significantly ease the learning curve or shorten the time for overcoming issues. The Armenian and Serbian NRENs collaborated on eduroam service operations and management. AMRES was interested in an easy-to-use solution for analysing and managing usage. AMRES is using such software, so several knowledge-sharing meetings were organised. This later connected with the GÉANT Learning & Development team, resulting in an eduroam workshop hosted by AMRES in conjunction with the international CSIT 2017 conference held in Yerevan.

Participating in events helps AMRES to share knowledge, but also to gather valuable feedback. This information enriches training materials for AMRES member institutions, and is a starting point for future trainings under the GÉANT or EaPConnect umbrellas. Topics of interest for AMRES for potential cooperation between Serbian R&E institutions and counterparts from peer NRENs are: eduroam, federated identity services, DDoS attack mitigation, digital libraries and clouds.”

**ASNET-AM (Armenia – beneficiary partner)**

Hrachya Artsatryan, Head - Center for Scientific Computing, National Academy of Sciences

“EaPConnect organised a series of workshops, trainings and site visits to EU associate partners to help ASNET-AM develop sustainable cutting-edge services. Knowledge transfer from Dutch NREN SURFnet and AMRES was important for us to increase eduroam sustainability and visibility. In 2017 the number of service locations increased from 5 to 29. In April we participated in a Network Performing Arts Production Workshop, then in October was the ‘Music Without Borders’ concert between Minsk and Tallinn. Knowledge transfer from the Italian NREN GARR helped us to master and implement the LoLa service. Thanks to this service, ASNET-AM made contact with the Armenian National Philharmonic Orchestra and Komitas State Conservatory of Yerevan. Participation in GARR’s Clouds Workshop in June was crucial for us to deploy an experimental ‘Infrastructure-as-a-Service’ platform. This allows us to increase our level of collaboration with the National Library of Armenia by providing customised VMs for its needs. Supercomputing and data analytics are interesting topics for the upcoming year.”

**BASNET (Belarus – beneficiary partner)**

Sergei Kozlov, Head of network administration sector, UIIP, National Academy of Sciences

“There was a 100% increase of access capacity to GÉANT for BASNET customers in 2017, following an external connectivity upgrade to 10 Gbps in August. As the result of increased visibility hosting the EaPConnect conference, EaPEC 2017, BASNET received a request from the Belarusian State University’s Center for Particles and High-Energy Physics to increase its access link bandwidth to LHC resources in CERN. This work is planned for 2018. In 2017, the Belarusian National Technical University provided eduroam to its users with the support of BASNET. Currently BASNET is working on providing it for the Belarusian State University of Informatics and Radioelectronics. With the support of EaPConnect we installed and tested LoLa devices with the network connection, and involved Belarusian musicians to perform in ‘Music Without Borders’. This positive experience gives us hope for future adventures. We expect that LoLa will be in Slovakia and, with SANET, we will be able to organise a public concert of folk, classical and jazz, with audiences in Minsk and Bratislava.”
EAPCONNECT’S ‘ENLIGHTEN YOUR RESEARCH’ STRETCHES COLLABORATION BOUNDARIES

For the third consecutive year, the EaPConnect project has invited Eastern Partnership (EaP) research and education communities to ‘Enlighten Your Research’. As well as collaboration in scientific research fields, EaPConnect added the possibility for cooperation in the area of musical performance, artistic research and education.

By proposing a project that would use computer network resources and services to foster international collaborations and accelerate the research and discovery process, selected researchers can secure those resources and present their proposals at this year’s Eastern Partnership E-Infrastructures Conference, EaPEC 2018.

EaPEC 2018 will be hosted by RENAM in Chisinau, Moldova: www.eapconnect.eu/conference

EaPEC Winners of EYR@EaP2017:

• Grusha Alexander Ivonovich, Central Scientific Library Yakub Kalos of the National Academy of Sciences of Belarus for “Heritage Digital Data”
• Boris Hincu & Elena Calmirs, Moldova State University for “Elaboration of the Task Oriented Instrumental Support (TOIS) for Integration of MSU and IM HPC Clusters into a Cloud Computing System”
• Maryna Druchenko, Scientific and Technical Library, National Technical University of Ukraine for “For IPA Digitization Center: Center for digitization of cultural heritage for the Ukrainian libraries, museums and archives”
• Yevhen Piotriuk, Nizhyn State University named after Mykola Gogol for “Through Research to Perfection: New Approaches to Continuous Professional Development of In-Service Teachers”

The programme promotes the benefits of computer network resources to researchers, challenging them to stretch the boundaries of their research and collaborate with other countries to perform experiments enabled by NREN infrastructures, services and support. The EYR@EaP2018 call for proposals has been open to all science, arts and humanities disciplines, with a particular interest in high-performance computing and researchers working in eHealth and cybersecurity.

The call closes on 16 March 2018. We look forward to seeing this year’s winners in Chisinau at EaPEC 2018!

Further information: www.eapconnect.eu
WHAT MAKES GÉANT TICK

GÉANT is a unique organisation that plays a pivotal role for research and education worldwide. In one of our previous issues we presented Life at GÉANT, an initiative that is helping to attract new talent with a closer look at the people inside the organisation and what excites them about their working lives. CONNECT has selected two new employee stories to give you a flavour of Life at GÉANT. Visit www.geant.org for more!

Tell us about your experience at GÉANT

As soon as I joined GÉANT I felt part of the team. I love my job and I am impressed by the sheer scale of the projects that I report on; I never stop learning! Some of the projects are incredibly complex and I am intrigued by their full scope and impact. I also find cross-functional collaborations and initiatives very stimulating; I believe that such activities create a great buzz in the office.

Working at GÉANT has given me the opportunity to travel to Malaysia, Malawi and other remote countries to support, train and mentor the local finance teams collaborating with us on specific projects involving developing countries. It is for me a very rewarding experience to be involved in initiatives aimed at supporting and facilitating Research & Education around the globe hence helping to bridge the gap between the developed and developing world.

Here everyone is valued and given the space and the chance to thrive. It offers a truly international environment that values and embraces diversity and its atmosphere is genuinely welcoming and open.

About Munya

I was born and raised in Zimbabwe where I started my career working for the Mining Industry Pension Fund before moving to the United Kingdom in 2005. I was initially based in London where I worked in banking and finance and in 2009 I moved to Cambridge to join a non-governmental organisation as a Finance Manager. In 2013 I started at GÉANT as a Senior Project Accountant.

My job entails financial reporting on GN4-2 and also regular tracking of cost/finance progress, as well as providing support to the programme managers, activity and task leaders with day-to-day budget and cost management within their respective areas.

MUNYARADZI SHAHWE, SENIOR PROJECT ACCOUNTANT, CAMBRIDGE

What is special about GÉANT?

At GÉANT, everybody’s contribution is part of a collective effort to benefit the overall NREN community. We truly endeavour to provide value to customers in everything we do. The organisation promotes an atmosphere of partnership, trust and mutual respect. I am amazed by how much I am learning every day at a professional and personal level from such a diverse group of people from all over the world. In particular, what makes me really proud is to belong to an organisation that is also raising the bar of education for our society, globally.

About Christian

I used to be a middle-distance runner, I rarely won, but I always had the drive to succeed. I am enthusiastic and inspired by innovation and I can openly say that I am not afraid of failure. I endeavour to achieve the ideal balance between passion and drive. I always try to put myself in my customers’ shoes and deliver for them valuable and useful bite-size wins that they can use quickly and successfully.

CHRISTIAN GIJTENBEEK, SOFTWARE DEVELOPMENT ENGINEER, AMSTERDAM

What do you do at GÉANT?

I am a software engineer; I work with code, but I never forget that the outcome of my programming work will be used by people, so code is not cold or lifeless. I like to think strategically, understand what our NREN members need, and combine data that adds value to them: a process I thoroughly enjoy. An example of this is, the work I carried out for the Compendium, a project that delivered to NREN members a glance information of the entire and up-to-date map of GÉANT services in use by the whole NREN community.

In my job, I have the great opportunity to engage with our customers directly, understand their real requirements and deliver services that they are not yet aware they need. I am lucky to collaborate with so many clever and driven people within GÉANT’s impressive international community.

What do you most enjoy about your job at GÉANT?

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To read all the interviews featured in Life at GÉANT visit: https://www.geant.org/About/Joining-GÉANT/life-at-GÉANT

Happy reading!
What will the new WACREN network have to offer in terms of incremental changes for the W&C Africa R&E sector?

Higher education and research institutions in West and Central Africa are among if not the last connected in this academic world. This is not due to lack of infrastructure, but rather due to poor regulation of the telecommunications sector leading to very high connectivity prices. Some institutions pay as much as more than 1,000€ per Mbps per month! Yes, 1,000€. In these conditions, no institution can sustain the provision of broadband connectivity to its community. Some institutions with tens of thousands of students have a total bandwidth of less than 100 Mbps. WACREN and its members are here to change this, so that the education and research community in the region finally enjoys high capacity connectivity, that allows them to learn, teach and do research under unprecedented favorable conditions.

How can other NRENs in the W&C African region benefit from the network?

The network is actually for the NRENs in the region and their constituencies. We currently have 12 member NRENs but all countries in West and Central Africa can benefit from the infrastructure we are putting in place. Fortunately, the AfricaConnect2 (AC2) project funded by the European Union and that WACREN is implementing in collaboration with GÉANT for West and Central Africa gives us the opportunity to speed up the deployment of our regional network. The backbone is being deployed and the first NRENs will be connected to it before the end of the first quarter of 2018. Users of these NRENs will be able to enjoy a huge difference from what they are experiencing today.

Are there more countries that have the potential to be connected to the countries in the region and/or Europe?

AfricaConnect2 and other projects funded by the European Union under the H2020 framework (PANREM, Sudlink and MAGO2) have helped the WACREN community a lot. Today, we are on the eve of launching our regional network. As of today, 6 NRENs have made contributions to the counterpart funding that WACREN has to provide for the implementation of the project. These NRENs will be connected in priority, and we expect that they will all be connected within the next 3 to 6 months. Other NRENs are close to also contribute to the AC2 counter funding. We are confident that by the end of this year, at least 10 NRENs will be connected to the WACREN backbone. It is however worth mentioning that WACREN is an open, inclusive organization. Even NRENs that have not contributed to the building of the backbone under AC2 can still benefit from connectivity and other services from WACREN, though not under the same preferential conditions than for the NRENs that have contributed to the effort of building the backbone.

How do you see WACREN work in a bigger context of the pan-Africa R&E landscape?

WACREN works hand in hand with its sister organizations ASREN and Liburutelecom. Today, if you want to communicate among us, the traffic has to go through Europe. One of the objectives of the AfricaConnect2 project is not only to facilitate the connection of these three clusters to GÉANT, but also to facilitate direct interconnections. It is therefore planned that the three regional networks covering Africa interconnected, so that traffic between them won’t have to transit through Europe or the US, I am confident that this will happen soon.

On January 15 it has been announced that following a tender call in June 2016, GÉANT has awarded a 15-year contract to MainOne for connectivity services. This means that WACREN joins the global R&E networking community through a network that provides a 10Gbps link from Lagos to London where it connects to the GÉANT network. West and Central Africa are therefore provided with access to R&E collaborations with over 50 million researchers, academics and students across Europe. As part of the contract, an additional link will go out from Lagos to Accra. Not only will this contract connect the first two countries in West and Central Africa, but it will also form the building block for the WACREN backbone support of R&E communities across the entire Central and Western part of the African continent.

What will the WACREN 2018 conference be about?

The theme of WACREN’s 4th annual conference is “Africa Connect ME – Unleashing Potential”. This is a subtheme associated with that main theme. These cover important subjects such as advanced network technologies and services, building and strengthening the pan-Africa R&E landscape. Some issues we have received some questions we had regarding these topics and we can expect a very exciting conference.

What concrete outcomes do you expect from WACREN 2018?

The annual WACREN conference has always provided the opportunity of bringing together the WACREN community as well as WACREN friends for face to face interactions and exploration of collaboration opportunities. It is a unique opportunity to strengthen the relationships between members of our community and between them and friends from other world regions. This has a high value for us. This year’s conference will also feature a special event: we will be launching the WACREN network. We are currently working hard to establish the first WACREN links and the interconnection with GÉANT.

Looking back at the previous conferences, what has been the biggest development this edition of the WACREN conference will offer?

The feedback we receive from the participants since we started organizing our annual conference is that they are of high quality and that improvements are noticed every year. This is despite the low-level of staffing we currently have. This means that besides the efforts of the staff, we also get a lot of support from our local hosts and the community at large. The number of participants is also increasing year after year, and we expect to witness the same pattern this year. And as I said earlier, there is a very important highlight at this year’s conference: the official launch of the WACREN network.

How do you predict the current imbalance of gender participation in IT will change in the coming 5 years, based on the last workshop and its participants?

We cannot develop our region without more than half of our population. The fact is that we have a big challenge involving women in our activities, because they are technical, and there are few women in science and technology in our region. We see that there is a big potential to increase the number of participants?

The participants wound down at the end of the 3-day training workshop in the “ICT for Girls” community day, a networking opportunity open to faculty and students of other women tech hubs with representation from government and industry. Some institutions with tens of thousands of students have a total bandwidth of less than 100 Mbps. WACREN and its members are here to change this, so that the education and research community in the region finally enjoys high capacity connectivity, that allows them to learn, teach and do research under unprecedented favorable conditions.

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Women in WACREN workshop:

22-26 Jan 2018, Lagos, Nigeria.

Leveraging a broader promotion of maker culture and hackspaces in WACREN, this event is part of a programme aimed at reducing current imbalances in gender participation. It aims to supply female students and staff to improve STEM skills through experimentation with robots and electronics and learning to program these devices.

The participants wound down at the end of the 3-day training workshop in the ‘ICT for Girls’ community day, a networking opportunity open to faculty and students of other women tech hubs with representation from government and industry.
AFRICACONNECT2 AND EUMEDCONNECT3 TAKE TO THE STAGE AT HQ OF LEAGUE OF ARAB STATES

The 7th Arab States Research and Education Network (ASREN) flagship event - e-AGE 2017 – took place on 3-4 December 2017 in the palatial setting of the Headquarters of the League of Arab States (LAS) in Cairo – usually where Arab Head of States meet and Arab politics is made.

Securing an enduring place on the global R&E map

Held under the patronage of HE Ahmed Aboul-Gheit, LAS Secretary General, the event attracted over 80 delegates from 21 countries and offered a high-quality programme with updates on R&E developments across the Arab region and new opportunities for international cooperation.

During the opening session, ministers and senior officials stressed the importance of technological literacy as a key factor for socio-economic and scientific progress and recognised the role of initiatives such as AfricaConnect2 and EUMEDCONNECT3 in enabling international collaboration and in forging citizens of the world.

Ambassador Ivan Surkoš, Head of the European Union Delegation to Egypt, gave a positive keynote speech about GÉANT and its role in regional projects, considered as reflecting the EU’s efforts to integrate the region into the global R&E map.

CSRIT training

A TRANSITS-I training course for new or potential computer security incident response team (CSIRT) personnel was arranged by GÉANT and ASREN and successfully delivered on 5-6 December at Cairo University.

Positive developments

e-AGE2017 provided an effective platform to spread the word about R&E networking across the Arab and African world. In addition, the day prior to e-AGE2017, combined project meetings for EUMEDCONNECT3 and the North African cluster of AfricaConnect2 took place jointly with Internet2’s Middle East SeID chaired by John Chapman. The meeting was hosted by the Egyptian AfricaConnect2 partner EUN (Egyptian Universities Network) at Cairo University and saw the following key updates and developments:

AfricaConnect2:
- In North Africa, GÉANT and ASREN are discussing plans with the partners for upgrading Egypt’s connectivity and for re-connecting Tunisia and Morocco;
- a further phase of AfricaConnect for the whole of Africa is being planned by the European Union after the current phase ends in November 2018.

EUMEDCONNECT3:
- Lebanon’s connectivity was recently further upgraded from 800Mbps to 1.4Gbps to accommodate increasing demand from universities;
- Jordan’s connectivity is upgraded to 1Gbps for the SESAME project and has reconnected the Jordan NREN JUNet;
- re-connection of Palestine was discussed with representatives from its Ministry of Education.

Gulf Region:
- UAE NREN Ankabut announced that their regional AGE-OX exchange point in Fujairah is now operational and is again being actively promoted as a regional hub. GÉANT has agreed to re-open the UAE NREN JUNet;
- re-connection of the Jordanese NREN JUNet was discussed with representatives from its Ministry of Education.

Many thanks again to ASREN and EUN for a productive week in Cairo!

Further information
For further information on e-AGE 2017 please visit http://asren.org.net/eage2017
UGANDAN STUDENTS ENHANCE UNIVERSITY SERVICES AND CREATE JOBS

The power of empowering
One of the latest additions to the In The Field blog is a story about a student start-up that originated from a project at Kyambogo University in Uganda. The case study was produced in the form of a video by the AfricaConnect2 project specifically for the 5th African Union - European Union Summit of Heads of State and Government held last November in Abidjan, Côte d’Ivoire. Themed “Investing in youth for a sustainable future”, the Summit offered a great opportunity to showcase the impact of R&E networks on sustainable development and job creation. The video tells the story of a group of students who, by utilising their software development and data management skills, created a suite of management software to optimise the day-to-day running and thus the student experience at Kyambogo University. On the back of that, a start-up company, ZeeNode, was founded to manage the software which is now being adopted by an ever growing number of institutions across Uganda.

RENU: key to the success
This is undoubtedly a success story of students who have created jobs and a future not only for themselves but also for the wider community. ZeeNode currently employs people in software development, engineering, finance, marketing and legal services. But this is also a success story of RENU, the Ugandan NREN. From the video you will find out how RENU was instrumental at every stage of ZeeNode’s development – from offering a cloud platform accessible to all its users to the uncapped traffic between members of the NREN which fosters local collaboration.

“...the role of NRENs is to serve as the catalyst for innovation, for education and for development,” – says Isaac Kasana, the CEO of RENU in the video and indeed the Kyambogo University case study is a living proof of that.

Joining forces
The beauty of R&E networks is that collaboration is happening in various levels. The video production brought together people at RENU, the UbuntuNet Alliance and GÉANT who joined forces to tell this success story and gained new skills and a deeper mutual understanding in the process.

Read the blog post written by RENU and watch the video at https://www.inthefieldstories.net/ugandan-students-enhance-university-services-and-create-jobs/
2ND TEIN-CAREN WORKSHOP: FOCUS ON EURASIAN KNOWLEDGE BELT

Natural bond
Representatives of the Central Asian and Asian R&E and NREN communities gathered last December in Tashkent, Uzbekistan for the 2nd TEIN-CAREN Workshop. Hosted by Tashkent University of Information Technologies (TUIT), the workshop offered an ideal platform to explore new collaboration opportunities and to consolidate the natural bond given the geographical proximity of the two regions.

Eurasian knowledge belt
Prof. Askar Kutanov, CEO of the CAREN Cooperation Center (CAREN CC) and Mi Hye Joo Yoon, President of the Korea-based TEIN Cooperation Center (TEIN*CC) reinforced their commitment to increasing utilisation of the CAREN and TEIN network and to supporting trans-regional research (TEIN*CC) reinforced their commitment to increasing utilisation of the CAREN and TEIN network.

Uzbekistan
Emphasising the strong bond between Korea and Uzbekistan, Prof. Botir Usmanov, Vice-Rector for Scientific Affairs at TUIT, highlighted the collaboration potential of the local R&E community and welcomed the efforts underway for Uzbekistan to join the CAREN project which aims to create a regional R&E network across Central Asia and to interconnect it with the pan-European GEANT backbone.

Collaboration is a must, good connectivity is key!
A strong will to collaborate was also the common denominator in presentations by user representatives from Korea and Central Asia, with focus on telemedicine, e-learning, e-government and natural risk management. The message was sound and clear: scientists, educators and the medical community want to collaborate, and good connectivity is essential.

Find out more:
CAREN: https://caren.geant.org
TEIN/Asi@Connect: http://www.tein.asia

EOCS-HUB: INTEGRATED SERVICES FOR THE EUROPEAN OPEN SCIENCE CLOUD
How GÉANT is contributing to this significant new project

The EC-funded EOSC-hub project started on 1 January 2019, bringing together an extensive group of national and international service providers to create the Hub, a central contact point for European researchers and innovators to discover, access, use and reuse a broad spectrum of resources for advanced data-driven research.

GEANT is one of the key partners of the consortium as are several members of the NREN community including CSC, the host institution of Finland’s FUNET, CESNET from the Czech Republic, GÉANT from Greece, PSINet from Poland, SRCE from Croatia, and Uninet from Norway.

Together the partners will develop the vision of the Hub as the integration and management system of the future European Open Science Cloud. The EOSC-hub project mobilises providers from the EGI Federation, EUDAT CDI, INDIGO-DataCloud and other major European research infrastructures to deliver a common catalogue of research data, services and software for research.

For researchers, this will mean a broader access to services supporting their scientific discovery and collaboration across disciplinary and geographical boundaries.

GEANT will contribute directly to the work package focusing on Business Models and Procurement, bringing on board expertise and best practices on procurement and purchasing frameworks. Specifically, GEANT will lead the development of framework agreements and structures that simplify the purchasing process and reduce the administrative cost from the buyers while ensuring access to suitable offers.

In parallel, the GÉANT (GN4-2) Project will establish a collaboration agreement with EOSC-hub project and its partners. “The EOSC-hub project will support European researchers through easier and broader access to the services of e-infrastructure providers; GÉANT looks forward to a close collaboration with the project and its partners.”

How GÉANT is contributing to this significant new project
What does EOSC mean in practice? What are the key factors for success? What is the role of research communities? What are the common goals for EDI & EOSC and how should they work together?

These are a few of the questions that over 200 participants of EUDAT’s Conference “Putting the EOSC vision into practice” strived to answer at the 3-day meeting in Porto. Attendees included policy makers, service providers and research community representatives from 25 countries working on various data challenges and disciplines.

The conference was opened by Dr. Augusto Burgueño Arjona, Head of the Unit “eInfrastructure & Science Cloud”, DG CONNECT who presented EOSC as an important instrument to support collaboration between e-Infrastructures & research infrastructures, and to promote open science: “EOSC has to be an inclusive ecosystem where horizontal and thematic service providers work together to meet the user needs.”

The discussion on transforming the EOSC vision into practice continued with a panel moderated by Annabel Grant, Senior Stakeholder Engagement Manager, GÉANT with Françoise Genova, Researcher at Centre de Donnees astronomiques de Strasbourg (CDS), Per Öster, Director, CSC & EOSC-hub Project Director, Grazia Pavoncello, ministerial representative at the Italian Ministry of Education, University and Research (MIUR) and Alex Vermeulen, Carbon Portal Director of ICOS ERIC, participating, together with Augusto Burgueño Arjona.

The conference continued with an inspiring keynote by Michael Wise, Head of Astronomy, ASTRON - the Netherlands Institute for Radio Astronomy, on the data challenges behind the Square Kilometer Array (SKA) Project. “Based on current projections, the SKA Observatory, once operational, is expected to produce an archive of standard data products with a growth rate on the order of 300 petabytes per year. Any further processing and subsequent science extraction by users will require significant, additional computing and storage resources.”
About the EUDAT CDI

With a network of more than 20 European research organisations, data and computing centres in 14 countries, the EUDAT Collaborative Data Infrastructure (CDI) is one of the largest infrastructures of integrated data services and resources supporting research in Europe. It is designed to address the full lifecycle of research data, representing a strategic solution to the challenge of data proliferation in Europe’s scientific and research communities and it is realised through an ongoing collaboration between Service Providers and Research Communities working as part of a common framework for developing and operating an interoperable layer of common data services.

The CDI services cover data access, data storage, data discovery and metadata, persistent identification, data management, authentication & authorisation, service management infrastructure and Research Data Management (RDM) training & consultancy. More information at www.eudat.eu

OUTREACH & EVENTS

PRACE has a number of outreach activities targeted at the current and next generation of computational scientists and PRACE users.

Outreach to Universities

The PRACE Outreach to Universities programme, is a one-stop shop for the latest student-centric information, educational opportunities and more. These activities are especially designed to encourage advanced HPC, Computational Science, Simulation and Data Science studies and highlight their benefits and value.

Sign up to the PRACE Outreach to Universities programme mailing list to be kept informed of all PRACE activities which are aimed for students.

http://www.prace-ri.eu/outreach-to-universities

PRACEdays18 and European HPC Summit Week 2018

The European HPC Summit Week 2018 in Ljubljana will gather together the main HPC stakeholders in Europe. Similar to previous years, this edition will also offer a wide variety of workshops covering a number of application areas where supercomputers are key, as well as HPC technologies and infrastructures. PRACEdays18 is the central event of the European HPC Summit Week, and is hosted by PRACE’s Slovenian Member ULFME – University of Ljubljana, Faculty of Mechanical Engineering.

Registration for the European HPC Summit Week 2018 and PRACEdays18 is open. The deadline to register is 7 May 2018.

http://www.prace-ri.eu/pracedays18

Pictures

Top left; Panel Plenary Session 2: The European Data Infrastructure (EDI) and the Data Challenge

Top right; Michael Wise, Head of Astronomy, ASTRON

Middle right; The EUDAT community at work

This presentation set the scene for a second panel discussion “The European Data Infrastructure (EDI) and the Data Challenge” which focused on understanding the role of HPC in the EOSC and EDI landscape and was chaired by Rob Baxter, EPCC, University of Edinburgh with Serge Bogaerts, PRACE, Giuseppe Fratini, CINECA, Kimmo Koski, CSC, Sinead Ryan, Trinity College Dublin, and Michael Wise, ASTRON.

These recommendations were further discussed in breakout sessions which explored the crucial aspects in creating a thriving data economy, such as legal issues, interoperability of services, the role of research infrastructures as thematic service providers, and business models and sustainability of data infrastructures.

Nine complementary events organised by ENVR, EOSC4all, the EUDAT Working Groups on Sensitive Data, Semantic and Array Databases, GÉANT, LIBER and RealDataCloud allowed participants to deepen specific topics and to establish new collaborations.

Finally, the conference enabled stakeholders to discuss the future of EUDAT and the EUDAT Collaborative Data Infrastructure (CDI). The EUDAT CDI will continue developing and operating an interoperable layer of common data services to support research in Europe and will allow EUDAT to play a concrete role in the EOSC-hub project (www.eosc-hub.eu) and wider EOSC ecosystem. This will guarantee a continuous interaction with user communities that have been at the heart of the EUDAT strategy since its start in 2013.

Registration for the European HPC Summit Week 2018 and PRACEdays18 is open. The deadline to register is 7 May 2018.

http://www.prace-ri.eu/pracedays18
HOW AI AND AUTOMATION WILL CHANGE NETWORKING

We cannot talk about automation in telecommunications without considering the important changes that are ongoing across the industry. In the wake of the paradigm shift introduced by the cloud revolution, networking is evolving too. This is because there is growing need for scalability.

There are different reasons behind this request, including the continuous need for larger bandwidth connections, an exponential rise of devices on the network, a larger amount of data to manage and, finally, an ever-increasing user mobility and a need for services to be accessed anywhere in the “cloud” mode.

In this context, the software component, automation and artificial intelligence will be strategic for managing processes and ensuring support for decisions. This will expand our ability to get data and information on the network to make decisions. This will expand our ability to get data and information on the network and to plan developments in real-time.

A new paradigm in networking layers or “bricks”? 

The current network model is based on a multi-level architecture. For each level there is a corresponding element (fibres, amplification and transmission equipment, IP routers, etc.) strictly connected in a hierarchical way. It is almost a static system, which requires manual configurations, and presents rigid points of demarcation. It works and it is resilient, but this network stability is paid in terms of adaptability. Today, however, we observe a different trend: it is not possible to achieve the goal. Introducing the concept of “zero touch networking”, Bikash Koley, director of Google network architecture, said that 75% of network malfunctions are due to human interventions, since the human mind is unable to record the complexity of the “state of the art” of the network, which is made up of different variables and functions; this is why software intervention is absolutely essential. We are therefore advancing towards an intent-based networking, as stated by Gartner.

Fault finding via AI

In the current model it is easier to solve a dysfunction because you can just identify the level where the dysfunction happens, access it and act on it, while in the disaggregated model it is necessary to access different information from all components involved and make correlations to understand where the problem is. For sure, a key role will be played by artificial intelligence that can analyse the different components, in support of decision models. The business organisation will still be based on functions, thus the roles of the network specialist, the software specialist and the IT specialist won’t disappear, but the services will involve different functions so we can suppose that this will affect in some way the organisational model.

Software Defined Services vs hardware constrained networks

In this scenario, the software element acquires an increasing importance, while hardware is increasingly considered as a simple and inexpensive commodity, which has to be first of all reliable and easy to set up. This change is already underway and the OTTs are benefiting of it. From a “layered” model we are moving to a “functional” model, where the concept of service to the end user is completely modified because every single component (transmission, storage, computing, firewall ...) becomes a service to be combined with others as needed. How do you put the different components together? How is this complexity managed? At this stage an important role is played by automation and in particular by the so-called “declarative” model. In this model we first declare (describe) the service architecture, and then the software decides how to carry out the process to achieve the goal. Introducing the concept of “zero touch networking”, Bikash Koley, director of Google network architecture, said that 75% of network malfunctions are due to human interventions, since the human mind is unable to record the complexity of the “state of the art” of the network, which is made up of different variables and functions; this is why software intervention is absolutely essential. We are therefore advancing towards an intent-based networking, as stated by Gartner.

Accelerated Service Development

Why did we get to this model? A very strong reason is that the speed in producing innovation is increasingly required. Thanks to the high flexibility of this new model, it is possible to create more services and to reduce the implementation time; in the first model it takes 2-3 years for developing a service (which remains operational for 7 years) while in the disaggregated model it takes only a few months to build new services (with a shorter life cycle and calibrated on real needs).

Reducing costs

But there is also an economic motivation: the cost of the layered model is no longer affordable because in order to increase performance, the whole infrastructure needs to be modified, while in the new model it is possible to operate only on a specific element, for example by setting up the optic part to achieve a bandwidth upgrade. Of course there are some risks, above all in relation to the responsibility models and the definition of communication channels between the different elements, but also in security management, which requires an increasingly widespread control and faster operations to mitigate the effects of a vulnerability. In relation to that, AI becomes a very important enabling tool. As part of GARR research network, we have developed a White Paper available online (see www.garr.it) and analysed all these issues together with our research community, with the purpose of anticipating changes. Making a smart network will be the end result, just because I think that nobody would like a dumb network...
CESNET HAVE A NEW LOGO

CESNET, an association of Czech universities and the Academy of Sciences, represents the Czech Republic in GÉANT. Since the end of last year, CESNET has presented itself under a new logo and the visual style based on it.

The new logo consists of the Association’s name and seven blue squares, which are a graphic representation of the letter ‘c’ in binary-coded ASCII. The authors Petr and Michal Stupka of Radical Design carried out conversion utilising the principle of a Cartesian plane coordinate system with x- and y-axes. If both axes have the same unit of length, we get a square grid in which we can move – a one will always be one row higher than a zero. The transcription of the letter ‘c’ produced a ‘binary smiley’, which has become the Association’s basic graphic symbol.

New logos have been created in the same manner for each of the Association’s services, which used diverse graphic styles before. The form of these graphic marks has also been determined by binary code, or more precisely the representation of the initial letter of the service in the code. Examples include:

- m for MetaCentrum (high-performance computing)
- d for DataCare (data storage)
- c for CzechLight (unique photonic devices)
- p for Perun (system for user, group and access management for services of the national e-infrastructure CESNET)
- f for FLAB (forensic laboratory)

Affiliation of the services to the CESNET brand is highlighted by the new graphic concept.

To spread this word, the conference sessions focussed on the General Data Protection Regulation (GDPR) that takes effect on May 25 this year and about security threats in daily life. In presence of the National Authority for Data Protection (CNPD-Luxembourg), participants were informed about this new regulation and its compliance control processes in general. Since research projects are concerned by GDPR too, a dedicated session was given about the changes in data protection for future research projects, providing advise and how to adapt to this new regulation.

Besides these GDPR sessions, another one focussed on the need for protecting data. For this, the audience was shown daily threats in information security for raising awareness next to the users to care for their data by illustrating the facility of acquiring data on most different ways. One major factor in the given examples was the human being. Social engineering attacks for stealing valuable information are observed on a daily basis in organization, ranging from phishing to dedicated attacks. Besides these attack, data can also be leaked involuntarily due to badly configured devices, may this be a wrongly configured printer communicating outside of its network or badly configured antennas, routers...

More information and the streamed sessions are available on the University of Luxembourg Twitter account: https://twitter.com/i/moments/957956658134683648.

This was the first conference organized by the University of Luxembourg and the RESTENA Foundation in the framework of the Data Privacy Day and another one will follow next year, so stay tuned!
HARMONISING THE SOFTWARE DEVELOPMENT PROCESS IN THE GEANT COMMUNITY

Introduction

The GEANT software community takes part in this collaborative development of applications and products which support services delivery. Along with the progressive delivery of services, the importance of reliable and resilient software components has increased to meet the demands of users.

Every service in GEANT has to provide high quality, meet the demands of users, improve the efficiency of SDTs, what obstacles they are facing in their day-to-day work. The usage of the SDM was a focal point during the meeting. Participants were encouraged to engage in a discussion about software development methodologies they are using. The most important points that were highlighted during the meeting were:

- There is an awareness about the SDMs within GEANT teams and some have observed tangible benefits from using SDMs selectively.
- The teams that have applied selected SDM practices rely on Scrum, Kanban or XP and are often adjusting processes (e.g. extending time periods) to their abilities.
- Most of the attendees confirmed their interest in participating in a workshop about practical implementation of SDM.
- Most of the attendees also expressed their interest in participating in a new task force on this matter.

Supporting the software community

GEANT Symposium 2017 – side meeting

The objective of the side meeting was to gather software developers from across G4N-2 as a forum for exchanging ideas and identifying any issues and obstacles that they are facing in their day-to-day work. The usage of the SDM was a focal point of the meeting. Participants were encouraged to engage in a discussion about software development methodologies they are using.

Words

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Who we are and what we are about

The software management (SWM) team in the GEANT (GN4-2) Project’s Service Transition and Software Management task is assigned to support the software development teams (SDTs) in harmonisation of software management and development practices, as well as to help in the adoption of consistent software management practices across GEANT services.

This can be achieved by improving the awareness of the effective software development methodologies (SDMs) and/or best practices. The SWM team started by exploring the current development practices, with the aim to learn what could be done to improve the efficiency of SDTs, what obstacles they have faced etc.

In that process, the SWM team encourages the developers to share their experiences and discuss methodologies applied in day-to-day work. The current situation in GEANT regarding the software development methodologies usage was taken into consideration to build solid grounds and determine the list of required activities for future actions.

GÉANT software catalogue

More than 30 software projects are being developed by around 20 software development teams of highly skilled professionals originating from different member NRENs. There is a number of retired software projects as well. A central and complete project catalogue is a must-have feature for federated community of software developers, to gain maximum benefits for collaborative work and alleviate some negative effects of team distribution, partial involvement to the project and similar. Such information repositories are present in large software communities (e.g. Apache Projects Directory), and evolve together with a growing portfolio of software projects.

The GÉANT Software Development Infrastructure is a web-based service acting as a connection between GÉANT, NRENs and industry in the field of software development. This can be achieved by improving the awareness of the effective software development methodologies (SDMs) and/or best practices. The SWM team started by exploring the current development practices, with the aim to learn what could be done to improve the efficiency of SDTs, what obstacles they have faced etc.

In that process, the SWM team encourages the developers to share their experiences and discuss methodologies applied in day-to-day work. The current situation in GEANT from existing sources consolidating the information in a unified and harmonised way.

The GÉANT Software Catalogue is in its initial phase at the moment. This phase aims to release a new service, which can complement the existing GEANT product portfolio i.e. GEANT toolset - Intranet, wiki pages, and software development infrastructure.

The functional requirements for the Catalogue come from software teams, GEANT coordinators, project managers and GEANT activity/task leaders. A proof of concept implementation was successfully presented during GEANT Symposium 2017 during a session on software development. As a result an active discussion on its target shape has started.

More information about this idea can be found at https://wiki.geant.org/display/timops/Indexing+theGEANT+software+projects

Planned activities

In accordance with the aforementioned, the SWM team took suggestions for the creation of a proposal for a Task Force on Software Management and Development (TF-SMD) in order to support the development and service provision for GEANT and NREN software development teams and promote the use of best practices for software development. TF-SMD would create the opportunity to introduce the industry practices and standards as well as lessons learned from other institutions. Additionally, TF-SMD would get familiar with NRENs’ experiences in building the SDTs, help to include the NRENs practices into GN4-2 and act as a connection between GEANT, NRENs and industry in the field of software development.

Contact us

This SA2 T1 team is waiting for your comments and questions regarding the harmonisation of the software development process in GEANT community.

Please send any message to Zarko Starasavljevic. SA2 T1 subtask leader: zarko.starasavljevic@thc.bcp.bg.ac.rs

50 • CONNECT ISSUE 28 2018
ARE YOU STILL TALKING ABOUT SDN? WE’RE DOING IT.

But it’s a very different creature from when software defined networking was first discussed and (glibly) defined as open, programmable networking. In its life it’s gone through some troubling moments (too complicated, not enough vendor support, incomplete ecosystem). And been the brunt of some (lame) jokes: what does SDN stand for? Still Does Nothing. Or twisted into Security Defined Networking – what is that?

Carolyn Raab, co-founder of Corsa Technology puts forward the case for SDN

I want to put forth the definitive SDN acronym standing for “Simply Defined Networking”. We all have learned a tremendous amount over the last few years. And I believe it has lead us to this very important point where we actually do understand SDN properly and we have identified that a crucial underpinning of the success of SDN is to keep things very, very simple. Whether you are dealing with routing at the core of the network or network security at the perimeter, open programmable networking must be synonymous with simplicity. I’d like to highlight a couple of examples of this simplified networking in action.

**Deriving Flexible, Dynamic Networks and Services**

Let me start with the success of GEANT’s Testbed as a Service offering as a prime example of SDN.

GTS is designed to support research teams investigating innovative SDN solutions and needing a high performance distributed infrastructure. GTS can simultaneously support multiple projects and isolates them from each other and from the production GEANT network to provide security and safety. The network testbed resources are dynamically allocated from real e-infrastructure distributed throughout the GEANT core service area allowing researchers to define, build, test and rebuild highly scalable, high capacity virtual networks quickly, easily and cost-effectively.

In essence, GTS is a very programmable, dynamic network. What is running behind the scenes (i.e. real infrastructure) is perfectly simple, openly programmable, high capacity SDN hardware with virtual forwarding contexts that can be spun up and down via compact, dedicated controllers for each defined service offering.

Instead of trying to create one over control plane that can do all things for all people, GTS took an SDN approach that allowed them to cut down the problem space into simplified, bite-size chunks that could be readily implemented, were logically isolated from the network and (just important) maintained over time.

When a researcher requires network resources, GTS provides a dynamically provisioned network environment consisting of computational servers, data transport circuits, and switching/forwarding elements. These environments become unique testbeds for each researcher which can be scheduled in advance and are selected from any of the GEANT core points of presence that have GTS services available. Each testbed constitutes an isolated and insulated virtual environment that can function autonomously from other testbeds or other production services. Keeping it simple for the use of the service, they need only create controller software for their particular network environment, independent of other services and functions on the network.

**Securing Networks with Disaggregated Network Security**

If we turn to network security, SDN is also able to play an important role in evolving how networks are protected. Instead of trying to force everything into monolithic, complicated platforms, disaggregate network security, the SDN way. Rethink network security built on a performant yet simplified flow-forwarding hardware appliance that excels at traffic export for data acquisition and network statistics as well as traffic enforcement for precision traffic filtering to maintain integrity of the network. And put at the best, super capable analytics, policy and smarts into the software cloud (where they should be).

In this context, we call the flow-based appliance a Network Security Control Point and it follows the SDN evolution seen in networking architectures of separating data plane (for network security, it’s data export for visibility and filtering for enforcement) from control plane (software analytics).

The control point is a transparent, in-line L3/L4 network security device that is simple to use and universal in that you can place it anywhere in your network, to perform any security action, and that it uses open interfaces for everything it does. We can then use the foundation of a SDN control point for network security service chaining that works at scale, in a manageable way. We all acknowledge that true dynamic security service chaining for the network core is proving to be challenging. Network architects and security engineers are challenged to develop real-time defenses that ensure their networks always operate with integrity and are properly protected. They are looking to create dynamic security service chains in the network to be able to spin up and down the right type of network security, at the right time and for the right segment of the network.

A network security control point drops into any existing network today with no reliance on changes to the control plane whatsoever, and it uses simple vlan tag switching for forwarding. It is elegant in its simplicity, which has pushed the complexity of previous attempts out of the problem. And at the same time it is a really powerful architecture that allows you to service chain virtual security instances or existing appliances to do pretty much anything you like when it comes to securing and protecting your perimeter.

I believe simplified networking is on the cusp of becoming broad spread. I look to initiatives beyond GEANT’s testbed service that are destined for this trend. Network operators’ efforts will focus on the applications and the underlying network and its security mustn’t be a distraction. Keeping next generation networks simple will be very important for that. We need to all pull together to make this happen.
How Software Defined Networking will affect the current WAN paradigm is one of the hottest topics in the world of networking. Mark Holmes, EU Business Development Manager at Dimension Data, explains;

I want to start by sharing the thoughts of Raoul Tecala, Global Business Development Director at Dimension Data on why and how “Wide Area Networks” (WANs) are being challenged by the emergence of Hybrid WAN architectures, utilising “Software Defined Networking” (SDN) and specifically on the current WAN cornerstone technology: Multiprotocol Label Switching (MPLS).

Are hybrid Wide Area Networks the nail in the coffin for MPLS?

A maturing Internet and the increasing adoption of cloud computing are changing the face of data management and delivery for good. Organisations are gradually moving to a more dispersed data model because not all workloads need to be hosted in a single, centralised facility anymore. Data sets can now be divided among owned or hosted data centres across a wide geography, as well as across different cloud providers situated, potentially, anywhere in the world.

R&E connectivity was, in most cases, provided by a dedicated, wide area network (WAN). In the great majority of cases, this network was based on multiprotocol label switching (MPLS) technology. MPLS networks are still popular today; however, as R&E increasingly uses dispersed services, several other connectivity alternatives may make sense from a cost and efficiency standpoint. Working together as a hybrid WAN, these alternatives may not only save on connectivity costs, but also provide greater capacity and performance. So does this spell the beginning of the end for MPLS as we know it?

Adding up the numbers

One of the main problems that a dispersed data model causes for the traditional MPLS WAN is application performance. For example, there’s the issue of “tromboning”. This occurs when remote users access cloud-hosted applications via the NREN network to the institution, and then back out over the same connection to the cloud provider. Depending on the physical location of the cloud service provider, potentially thousands of miles could be added to the round trip, which could cause application performance degradation. Applications that run on dispersed data centre infrastructures can therefore become slow and cumbersome to use.

In addition an institution’s connection is being used on both the inbound and outbound route for traffic that doesn’t need to go anywhere near the university resulting in the need for expensive “uplinks”.

By tuning the routing of each application’s traffic via the best available channel NRENs can deliver the necessary quality of service. In addition, organisations may improve overall network availability thanks to the real-time selection of diverse routes, where each link can serve as a backup for the other.

Slowing the process

Despite the obvious benefits, there are still factors holding organisations back from the immediate adoption of a more cost effective hybrid WAN strategy. Most NRENs have large investments in services and equipment which ties them to using the MPLS in the short to medium term. Adding alternatives to the connectivity mix would only add to their cost. The overall conclusion is that MPLS probably won’t die out completely, but it will certainly need to be more cost competitive in order to survive. MPLS will probably also become just one of several ways in which organisations connect, rather than the only or most important way.

Knowing what’s on your network

To take advantage of the benefits offered by alternative connectivity models, Tecala advises to start with an understanding of the applications you have running on your network, and what traffic volumes and patterns they create. Application traffic information, combined with real-time application performance data, can help you design a hybrid network that utilises the types and amounts of connectivity that’s right for your environment. A hybrid WAN enables you to take a real-time, application-centric approach to network traffic management.

How Dimension Data can help

Today’s digital service models are built on information technology that provides greater strategic value. Our services-led approach creates efficiencies and optimises IT for better outcomes. Through our global reach of world-class people, process and platforms, we maximise your existing infrastructure. We help you drive and manage your innovation through our enterprise-grade consulting, technical and support, and managed services. Delivered efficiently, reliably, and consistently anywhere in the world by people who care.

So my summary of what Raoul is saying here is that “yes” there are significant cost and performance opportunities in adopting SDN, however it is not just a simple case of replacing your current WAN services. Effort must be invested in addressing the “service operations architecture” to encompass SDN facets including that of software engineering.

Software engineering itself will play a significant role in “tuning” networks not only to specific applications but even down to single client instances. The “service architecture” will have to evolve to ensure continuity and integrity of the agreed risk profiles and to meet ongoing governance obligations.

SDN is now in its 2nd level of maturity, enterprises have and adopted the technology. They have realised the potential and are benefiting from it. The vendor landscape is moving at a pace with best in breed start-ups being acquired by large scale traditional players who have ambitions to take SDN to scale.

Consulting Services:

Leveraging our consulting services and technology expertise can accelerate your network transformation and innovation strategies. We help you create and execute strategies to unlock opportunities, optimise processes, and uncover cost savings. Our expert security consultants can help you secure your technologies by putting the right policies, processes, and architectures in place. Our Architecture Consulting Services can use existing and estimated future application traffic patterns to design a technology architecture for your organisation.

Technical & Support Services:

We help you maintain your environment through our technology and support services, proactively supporting and accelerating your network optimisation.

Cloud Services:

Our network-centric, highly secure private and public services meet today’s service and IT challenges, speed up development and transformation, and lower costs. They also mitigate risks by providing secure, responsive, high availability infrastructure which can respond to unexpected demand. We deliver our cloud services on our fully managed delivery platform, hosted within your data centre or ours, the Managed Cloud Platform comprises industry-leading hardware and software, coupled with virtualisation technology, operating system software, and CloudControl. CloudControl is our cloud management system which provides operational control and automation of cloud resources provisioning, orchestration, administration, and billing.

Managed Services:

Our managed services help you with the operations of your technology environments. We provide you with technical expertise, service consistency, and flexbility across multiple vendors, technologies, and geographies. Reduce your overheads and improve efficiency by leveraging our scale, methodologies, and high levels of standardisation.

Dimension Data and GÉANT

Dimension Data provides Public Cloud and related services to the education and research communities through the GÉANT cloud framework agreement. Many of the NRENs and institutes in Europe are legacy clients. For more information, please visit us at https://clouds.geant.org/dimension-data or alternatively find us on the GÉANT cloud catalogue or that of your local NREN.

https://clouds.geant.org/dimension-data

http://www.dimensiondata.com/GlobalSolutions/Cloud/
GÉANT AT A GLANCE

GÉANT is the leading collaboration on network and related infrastructure and services for the benefit of Research and Education, contributing to Europe’s economic growth and competitiveness.

GÉANT has 41 member countries and is owned by its core NREN membership, and also has Associate members including commercial organisations and multi-national research infrastructures and projects.

Networks
GÉANT interconnects research, education and innovation communities worldwide, with secure, high-capacity networks. We plan, procure and build the large-scale, high-speed networks that are essential for sharing, accessing and processing the high data volumes generated by Research and Education communities, and for testing innovative technologies and applications.

GÉANT also provides network and collaboration services that facilitate international cooperation between researchers and education, and bring people together for the human networking that drives innovation.

Services
GÉANT develops the services its members need to support researchers, educators and innovators - at national, European and international levels.

Our portfolio of advanced services covers connectivity and network management, trust identity and security, real-time communications, storage and clouds and professional services.

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

GÉANT facilitates community collaboration that pushes the boundaries of networking possibilities. Fresh ideas from task forces, special interest groups and open calls are applied through specific research activities and initiatives, informed by foresight studies and future user needs to achieve and promote innovation.

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

We have built up our depth of network expertise and leadership over two decades, and excel in managing and participating in highly successful projects, delivering Research and Education networks and services, and coordinating innovation.

Learn more at
www.geant.org

People
GÉANT collaborates with its members, partners and their research, education and innovation communities to drive research and discovery, keeping Europe at the heart of global Research and Education networking.

Through our extensive global partnerships we champion the role of national Research and Education networking (NREN) organisations and facilitate research networking across all world regions.

Join the conversation