

GÉANT Open Call

Online Information Event for Potential Applicants

19th April 2013

- Michael Enrico, CTO
- Guy Roberts, Senior Network Architect
- Annabel Grant, Open Calls Co-ordinator
- Paul Van Daalen, JRA 1
- Afrodite Sevasti, JRA 2
- Licia Florio, JRA 3

For Q&A

- Anand Patil, IPR Co-ordinator
- Milos Karapandzic, Project Co-ordinator



Agenda



- Introduction: GÉANT, DANTE, GN3plus project
- Introduction to GÉANT Open Call
- GÉANT Open Call
 - Theme 1
 - Theme 2
 - Theme 3
- Process & Timetable
- Questions and Answers



**25 European
POPs**



**12,000km of dark
fibre on 18 routes**



**50,000km network
infrastructure on
44 routes**

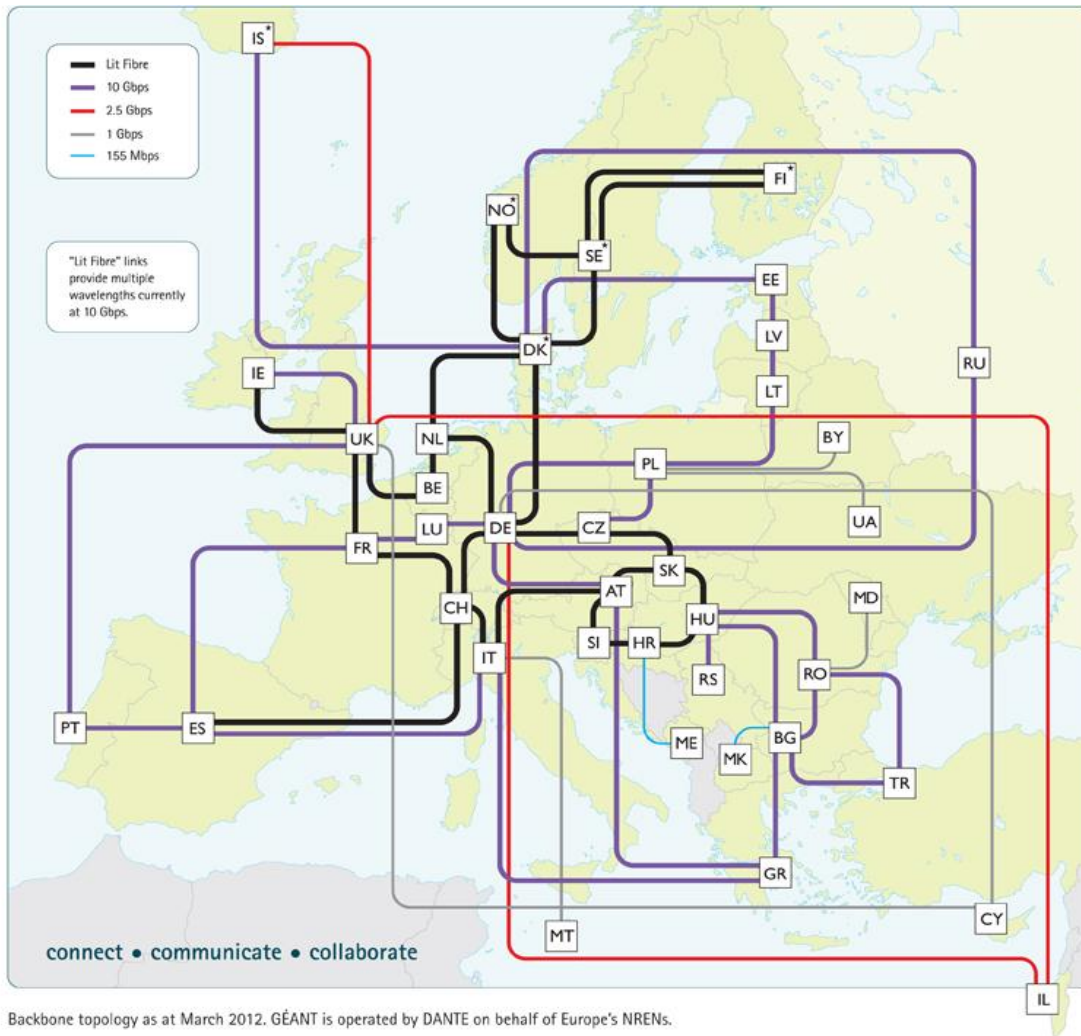
Diversified footprint

- Serves 40 million users
- 8,000 institutions
- Across 40 European countries



- GÉANT is co-funded by Europe's NRENs and the European Commission (EC) under the Seventh Framework Programme (FP7)
- Project Partners are 38 European NRENs, NORDUnet, TERENA and DANTE as Co-ordinator
- 150 FTEs' annual effort (> 350 individuals) working in GÉANT across Europe

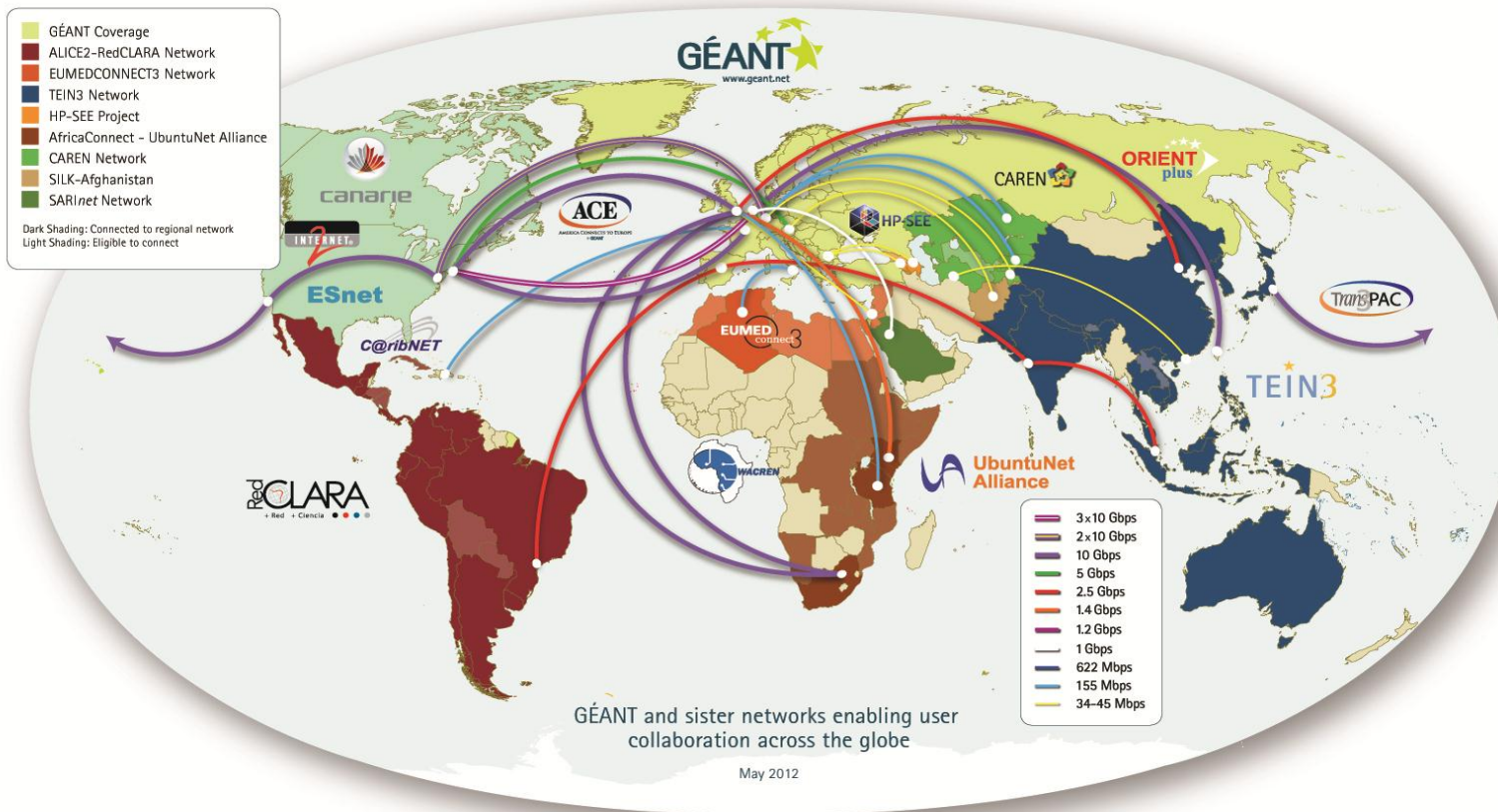




- 40 European countries
- Dark Fibre + DWDM
- Hybrid network:
 - **Routed IP**
IPv6, multicast, VPN
 - **Point-to-point**
Circuits typically 1+Gbps
 - **Dedicated Lambdas**
Full 10, 100Gbps
- Services:
 - Bandwidth on Demand
 - Network monitoring
 - Security
 - Mobility/AAI (edu*)



GÉANT At the Heart of Global Research Networking



DANTE – who we are, what we do...



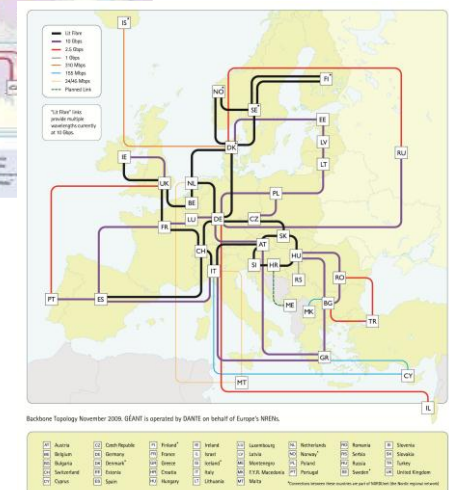
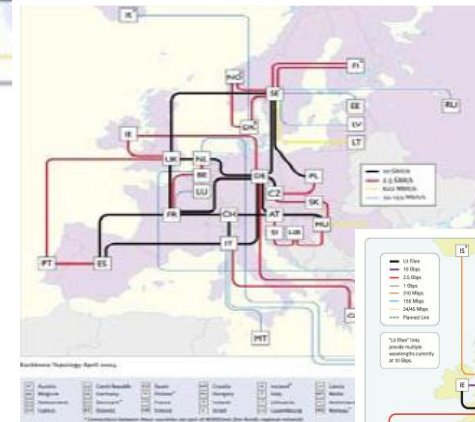
- **DANTE** (Delivery of Advanced Network Technology to Europe) established in 1993 - plans, builds and operates advanced networks for research and education
- Owned by Europe's **National Research and Education Networks (NRENs)** and works in partnership with them and the European Commission
- DANTE's work is primarily organised in the form of projects, which receive co-funding from EC e.g.
 - GÉANT via GN3plus – pan-European comms infrastructure
 - EUMEDCONNECT3 – Southern Mediterranean
 - CAREN – Central Asia
 - ORIENTPlus – China
 - AfricaCONNECT - Africa



GÉANT: History of a Success Story



- 2000-2004: GN1 Project
 - GÉANT Network
- 2004-2009: GN2 Project
 - GÉANT2 Network
 - Other Services
 - Joint Research Activities
 - Networking Activities
- 2009-2013: GN3 Project
 - GÉANT Network
 - Wider Range of Services
 - Joint Research Activities
 - Networking Activities



- **GÉANT vision:** become the unified European Communications Commons, driving knowledge creation, innovation and learning by connecting and empowering research and education communities within Europe and, as the global hub for research networking excellence, elsewhere in other partner regions.
- **GÉANT mission:** to deliver world-class services with the highest levels of operational excellence to research and education communities within Europe and beyond, helping talent and providing opportunities to meet across the divides of resources and distance, and so promoting the free, unimpeded movement of scientific data and knowledge.
- Duration 24 months: March 2013 to March 2015
- EC Contribution: €41.8m (total budget €84.1m)



GN3plus will strengthen GÉANT as follows:

- **Deliver world-class services** to research and education communities, building on GN3's success.
- **Support the growth of R&E communities** within Europe in both breadth and depth, and expose them to talent elsewhere.
- **Innovate to meet the needs of the community**, and act as a catalyst to translate this into a competitive European ICT sector.
- **Collect and share knowledge** about network technologies and services through cooperation and community gathering.



JRA1: Network Architectures for Horizon 2020

SA1: Core Backbone Services

SA2: Testbeds as a Service

JRA2: Technology Testing for Specific Service Applications

SA3: Network Service Delivery

SA4: Network Support Services

JRA3: Identity & Trust Technologies for GÉANT Services

SA5: Application Services

SA7: Support to Clouds

SA6: Service Management & Operation

NA1:
Management

NA2:
Communications
& Promotion

NA3: Status &
Trends

NA4:
International &
Business Devpt



- Introduction: GÉANT, DANTE, GN3plus project
- **Introduction to GÉANT Open Calls**
- GÉANT Open Calls
 - Theme 1
 - Theme 2
 - Theme 3
- Process & Timetable
- Questions and Answers



- Along with many EC-funded projects (e.g. those under FIRE or FI-PPP initiatives) there is a requirement that the GN3Plus project uses “**Open Calls**” as a method to realise some of the project objectives
- Generally this has the benefits of bringing in “new blood”:
 - Bringing new collaborators/partners into the project
 - Bringing in new ideas and innovation
- In the case of GN3Plus, the aim is to realise 50% of the RTD (research and technology development) work through an Open Call
- Total budget envelope is €3.3m



Who can participate?

- Any undertaking, university or research centre or other legal entity, whether established in a Member State (MS) or Associated Country (AC)* or third country

What are the rules?

- Similar evaluation as in EC calls

How can I participate?

- Submit a proposal as per Guide for Applicants
- Successful proposers will:
 - join as a Third Party to a consortium member OR
 - join as a Partner



*presently: Albania, Bosnia and Herzegovina, Croatia, Faroe Islands, FYR Macedonia, Iceland, Israel, Liechtenstein, Moldova, Montenegro, Norway, Serbia, Switzerland, Turkey. Full list in Guide for applicants

- One Open Call initially but reserve right to hold a **second open call** depending on the outcome
- Structured into **3 Thematic Areas (18 Topics)** as follows:
 - **Theme 1** - innovative projects/use cases that can make use of current GÉANT facilities – development and production
 - **Theme 2** is about facilitating competitive access to parts of the planned programme of RTD work being carried out within GN3 Plus JRAs
 - **Theme 3** is a more open “innovation call” - however outputs must be relevant to R&E networks



Theme 1: Innovative Uses of GEANT facilities

Beneficiaries: up to 11

- Topic 1: Photonic Level Access to Long Haul DF (3)
- Topic 2: Software Defined Networking Open Flow facility use (4)
- Topic 3: Dynamic Circuits - Novel uses of Bandwidth on Demand (2)
- Topic 4: Optical Terabit demo (2)

Theme 2: JRA work packages

Beneficiaries: up to 14

- Topic 5: Clean Slate Design for FI Architecture (1)
- Topic 6: Flexible Optical Network (1)
- Topic 7: Multi-Domain Optical Modelling Tool (1)
- Topic 8: Alien Wavelength over GEANT (1)
- Topic 9: Network as a Service (2)
- Topic 10: OGF NSI compliant CTS (1)
- Topic 11: CDN capabilities for REN (1)
- Topic 12: High-Availability Networking (1)
- Topic 13: Dynamic trust model protocols (1)
- Topic 14: Authentication mechanism supporting higher LOA (1)
- Topic 15: Building support for external attribute authorities (1)
- Topic 16: IEEE802.1X and EAP – standards based approach (1)
- Topic 17: Scalable ubiquitous access to networks & Cloud services (1)

Theme 3: Innovation

Beneficiaries: up to 5

- Topic 18: Hardening Network Management, Deterministic behaviour of multi-domain networks, Networks without borders (5)



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- This is all about soliciting innovative projects that can make use of current GÉANT facilities
- The following facilities are being made available:
 - Access to a selection of **long haul dark fibre routes**
 - Access to **GÉANT Dynamic** (the bandwidth-on-demand service available in parts of the GÉANT Service Area)
 - Access to the **GÉANT OpenFlow Facility**



- Access to these facilities give rise to 4 topics within this theme under which open call bids can be submitted:
- **Photonic Level Access to Long Haul DF**
- **Software Defined Networking Open Flow facility use**
- **Dynamic Circuits - Novel uses of Bandwidth on Demand**
- **Optical Terabit demo**
- These are expanded upon in the following slides...



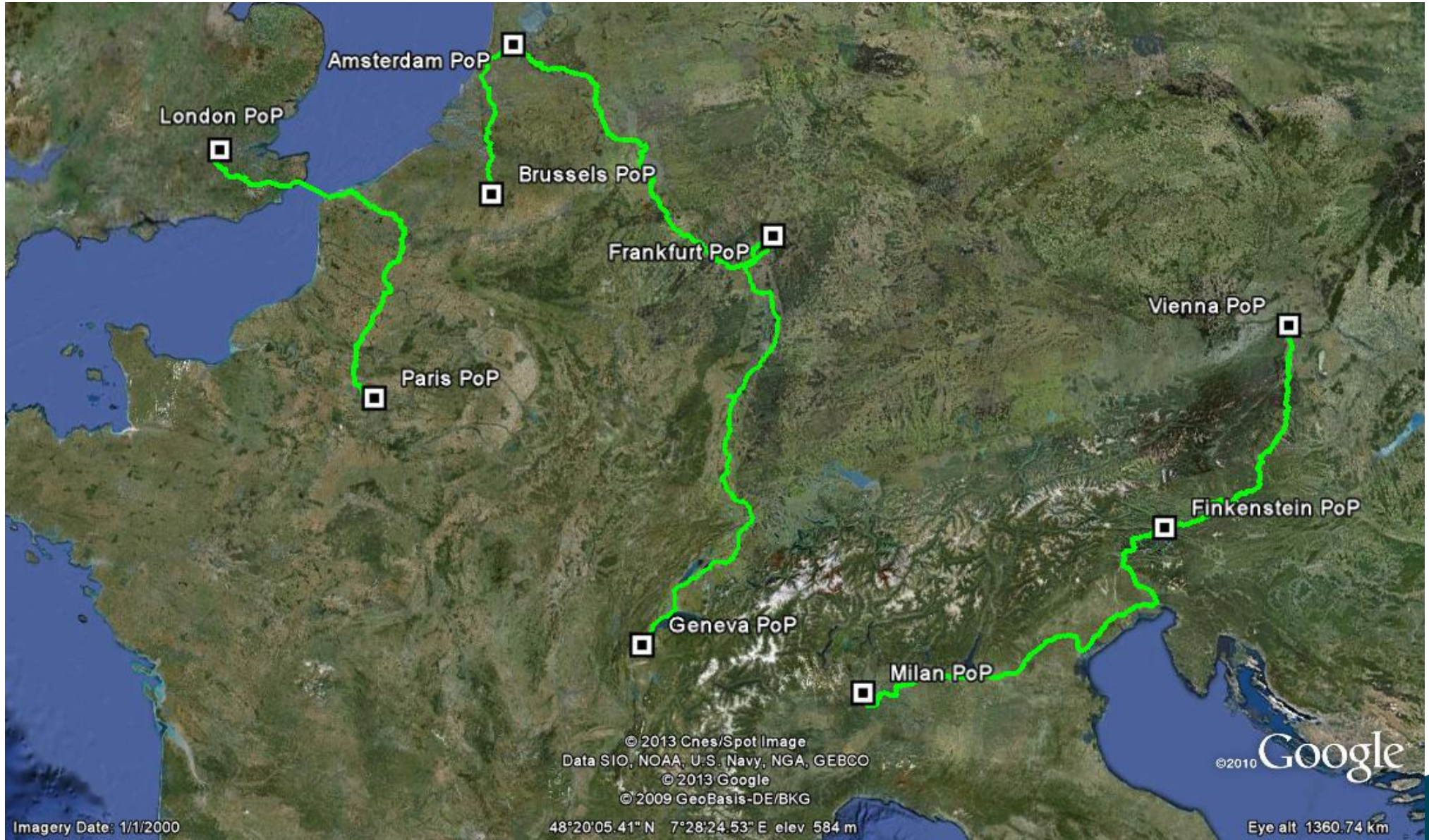
Topic 1: Photonic Level Access to Long Haul Dark Fibre (DF)

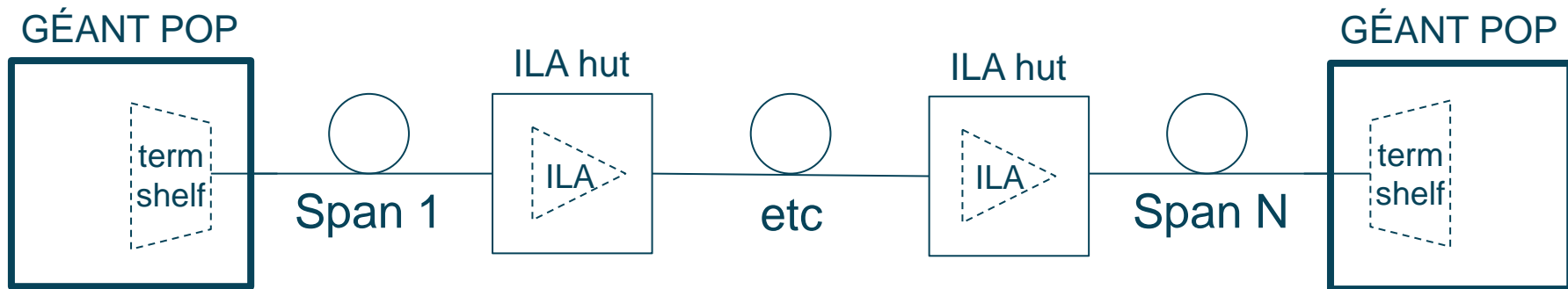


- For researchers that have a genuine need to use long haul dark fibre for photonic experimentation
- “Photonic” means dedicated access to the fibre line OR spectrum-shared access (via optical multiplexers, filters or the like)
- Essentially this takes advantage of a recent transmission infrastructure migration and upgrade resulting in 5 long haul dark fibre lines being “freed up” for experimental use throughout GN3 Plus
- These lines are between GÉANT PoPs:
 - London-Paris 673km, 9 Amplifiers
 - Frankfurt-Geneva 749km, 8 Amplifiers
 - Amsterdam-Frankfurt 665km, 8 Amplifiers
 - Amsterdam-Brussels 290km, 3 Amplifiers
 - Milan-Vienna 1105km, 15 Amplifiers



Long Haul DF lines available





- Spans typically have an average length/attenuation of 70km/17dB with the single longest span at 122km and highest attenuation of 28dB. Spans have varying numbers of mechanical (bulkhead) connectors.
- Limited space is available in GÉANT POPs to house any equipment that bidder(s) would like to locate there (subject to negotiation).
- Most ILAs have one 300x600mm (ETSI) rack available for use by bidder(s)
- See technical annex A for details of hut facilities and access arrangements.



- Bidder(s) will be able to place their own equipment in POP and ILA sites (subject to space restrictions) but it will first need to be vetted to ensure it is appropriate to be placed in commercial telecommunications facilities.
- There is no out-of-band management access available at ILA sites (see caveat below)
- Extant COTS transmission equipment is installed on the line and is available for use. e.g. for muxing, amplification, and perhaps remote management access to ILAs through the optical supervisory channel
- The extant equipment is Alcatel-Lucent 1626 Light Manager Rel 3:
 - Bidders can use it but will need to make their own arrangements to manage and support it at their own cost
 - 1626LM terminal shelves have been removed in some POP locations but can be reinstated (subject to confirmation)
 - If ILA shelves are not initially needed in ILA sites by bidder(s) then DANTE reserves the right to remove them in line with decommissioning practice in other parts of the GÉANT backbone and it will NOT then be possible to reinstate them at a later date



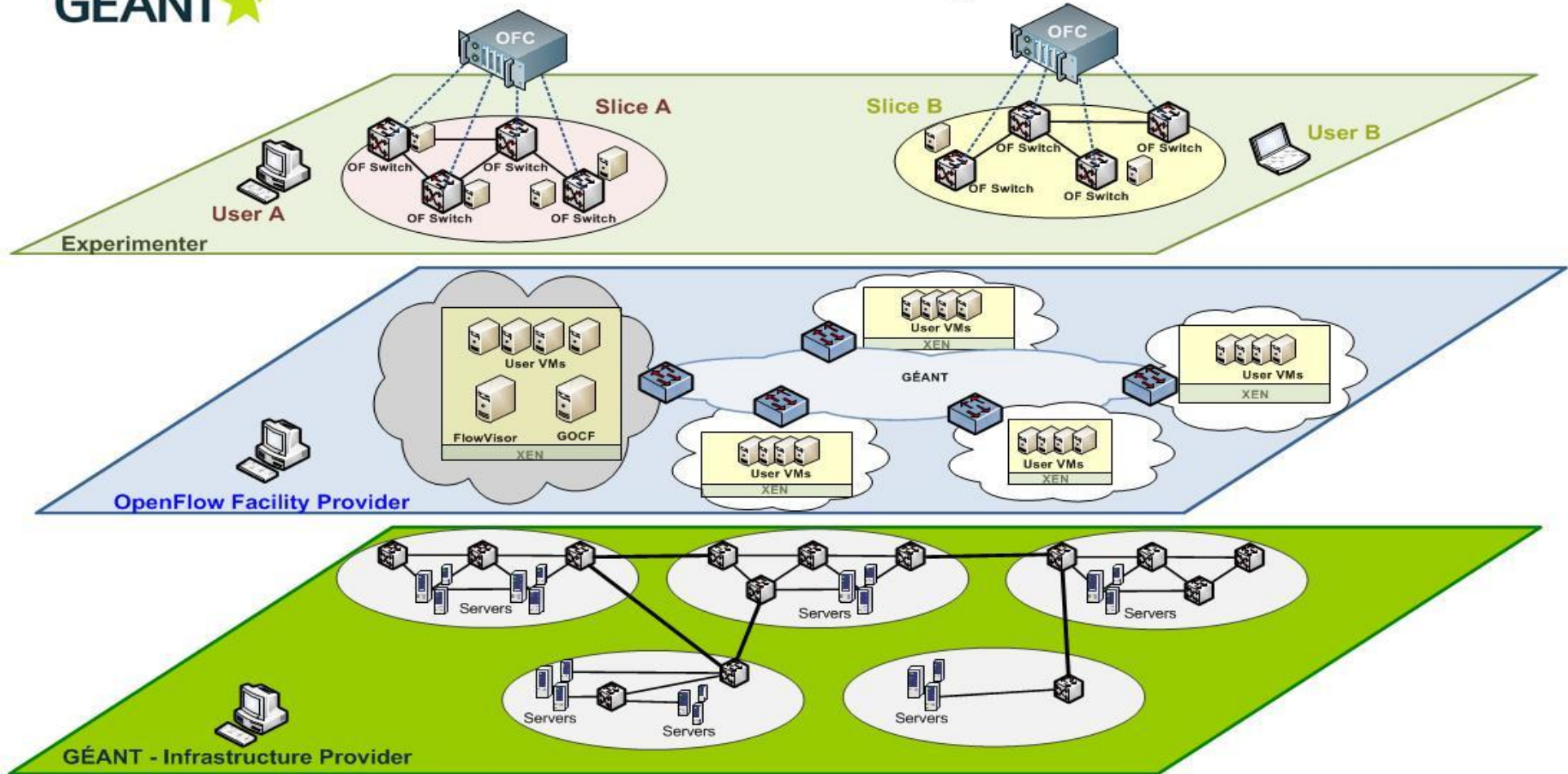
More info to be found at:

http://www.geant.net/opencalls/Call_Text/Pages/Home.aspx

Topic 2: SDN Openflow facility



Resource Provisioning



Resource Provisioning
 Full mesh isolated topology
 Internet connectivity
 Bare-metal servers



Technologies
 L2 ptp MPLS VPN
 GÉANT IP network
 Servers as Hypervisors & OF switches

Resource Provisioning
 OpenFlow control plane exposure
 OpenFlow controlled Ethernet data plane
 Virtual Machines



Technologies
 FlowVisor
 Open vSwitch
 XEN servers



➤ Use cases that benefit from an OpenFlow-enabled WAN

Access for awardees

<http://openflow.geant.net/>

OFELIA Control Framework v0.3

logged in as **root**

Dashboard Account Help

Action hardStop on VM leox1 succeed
Action start on VM leox1 succeed
Action hardStop on VM leox1 succeed
Action start on VM leox1 succeed
Action delete on VM leo2 succeed

Home > Project bme_mptcp > Slice two_paths

Slice two_paths in Project bme_mptcp

Slice status	Description	Man
	two nodes connected with two disjoint paths	Edit slice bas Delete slice. Update Slice

Topology
Selected OpenFlow switch: 00:00:00:00:00:00:01 at GEANT

OFELIA Control Framework v0.3

logged in as **root** in GEANT's Openflow island

Dashboard Account Help Logout

Action hardStop on VM leox1 succeed
Action start on VM leox1 succeed
Action hardStop on VM leox1 succeed
Action start on VM leox1 succeed
Action delete on VM leo2 succeed

Home > Project bme_mptcp

Project bme_mptcp

measuring the effect of recovery (i) in the optical layer, (ii) in the IP layer and (iii) in the transport layer using MPTCP.

Management Actions:

Edit basic information.

Delete project.

Members

Username	Roles	Actions
nemethf	owner	remove, update
sonkoly	researcher , owner	remove, update
gulyas	researcher , owner	remove, update

Add Members

Aggregates

Logo	Name	Type	Location	Description	Size	Managers	Status
	GEANT-OpenFlow	OpenFlow Aggregate	GEANT	GEANT OpenFlow Aggregate Manager	51	root	
	GEANT-XEN	Virtualization Aggregate	GEANT	GEANT-XEN	35	root	

Add Aggregates

Slices

Name	Description	Size	Owner	Reserved?	Actions
simple	simple	6	nemethf		details, delete
two_paths	two nodes connected with two disjoint paths	10	nemethf		details, delete
full_mesh	five node, full mesh topology	40	nemethf		details, delete

Create Slice

Topic 3: Dynamic Circuits - Novel uses of Bandwidth on Demand



- Multi-domain point-to-point Ethernet circuit service
- Guaranteed bandwidth up to 10 Gb
- Provisioned dynamically through a web portal or through an API
- Circuits provisioned immediately or scheduled in advance





Bandwidth on Demand Client Portal

Powered by AutoBAHN

[About BoD](#)[Request dynamic circuit](#)[Track circuits](#)[BoD Deployments Map](#)[My Profile](#)[Domains logs](#)[Statistics](#)[Domains settings](#)[User Administration](#)

NOC Panel

[Reservation Info](#)[Resources Calendar](#)[Access policy at DM](#)

Reservation Details

[Basic parameters](#)[Optional parameters](#)[Path constraints](#)

Start port

host in Poznan2 (PIONIER.pc.9f8e3cd7)

VLAN ?

0

AUTO

End port

"Caliban to Neptune" (JANET.pc.1bbaacd2)

VLAN ?

0

AUTO

Time zone ?

(GMT+01:00) Europe/Berlin

Start time

2013-04-16 15:22:16

Start Now



End Time

2013-04-16 16:22:16

Topic 3: Dynamic Circuits - Novel uses of Bandwidth on Demand



- BoD production and used for scientific work (e.g. Radio astronomy)
- 27 access points on the GÉANT backbone; more than 700 end-points available in Europe (see technical annex)
- Global collaboration - circuits provisioned to other continents



- This is an extension of Topic 1 and **the same operational caveats apply**
- Solicitation is for offers to demonstration terabit transmission between 2 GEANT PoPs (single or dual carrier)
- Expectation is that bidders will use prototype optical transmission equipment
 - However, equipment must be suitably “rugged” to safely installed in the GEANT PoPs and ILA sites
 - It may be decided that the prototype equipment may only be powered up whilst attended



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Theme 2: Topics 5-8

Paul van Daalen, JRA1

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- By the end of GN3 the migration to the latest transmission and switching technology will have been accomplished.
 - Dramatically increased capacity across the network but is still based on the same basic network architecture that has existed since the start of packet networking.
- As the demands grow and change, can these current network architectures support the wide range of
 - cloud services
 - sensor networks
 - scientific content delivery networks
 - high-speed mobile networking?



- To focus on how to design the next GÉANT and NREN network architecture, providing a set of architectural proposals for GÉANT and the NREN community in order for them to select the right path for their Horizon 2020 network architectures.
- To research which general architecture and network technologies are best suited for cloud-based services and how NRENs can design and build their networks to offer cloud-based services that scale to the full range of their users.
- To research access architectures suited to the aggregation of traffic from public Wi-Fi-based hotspots and private service providers LTE (4G) offering



JRA1 How to achieve objectives



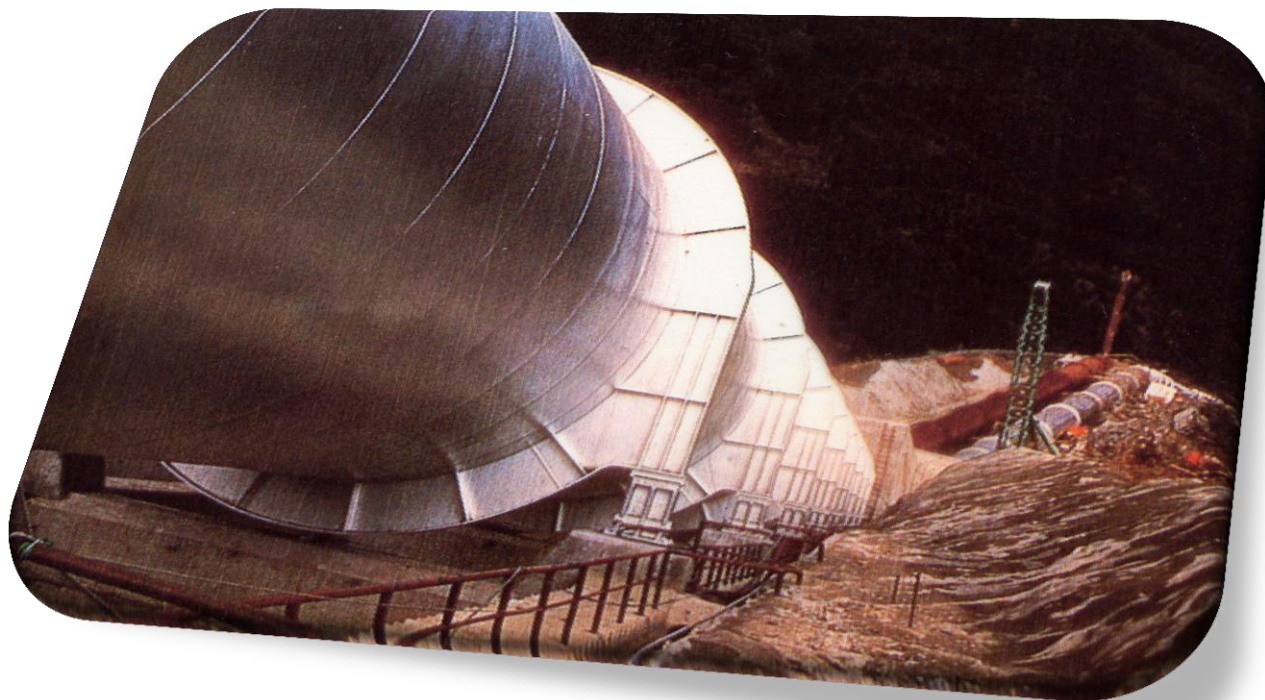
- JRA1 will research network architectural designs that might be better suited to a broader range of emerging services than the current architecture.
- The architectural designs could be amendments to the current architecture, clean-slate architectural design paradigms or something in between.
- This work should support and pave the way for the GÉANT and NREN architecture approach until the end of Horizon 2020.
 - Study of papers, GN3 JRA1 network technology studies, industry information and NREN-based architectural workshops.



Topic 5: Research clean-slate architecture



With rates of 100G now available, MP1 will investigate what the next service interface should be, or whether there should be a clean-slate service solution.



Study

Industry Cooperation

Test & Demo

Reporting

Research clean-slate architecture, involves rethinking the fundamental assumptions and design decisions of the current network architectures.



Topic 6: Flexible Optical Networks

Investigation and tracking of the development of flexible optical networks, ensuring that the NREN community is aware of and ready to deploy such services.

**BIT RATE
FEC CODE
SPECTRUM
MODULATION**

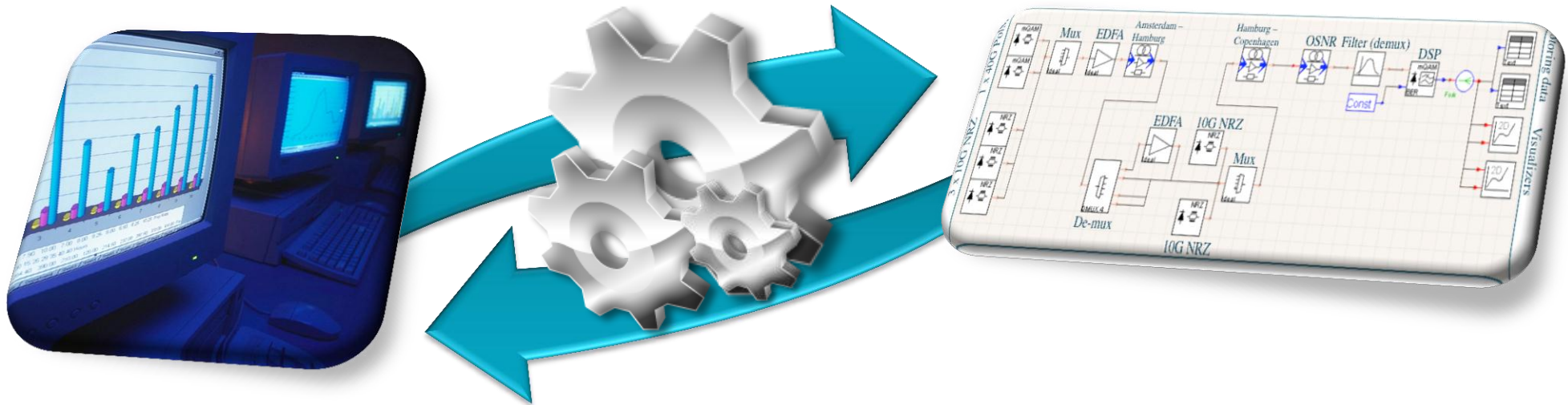


Investigate the novel concept of flexible optical systems. It will also experiment with the ability to optically transmit data with variable rates reaching Terabits per second, using the function pallet provided by flexible optical systems.



Topic 7: Multi-Domain Optical Modelling Tools

Within the priority theme of Single and Multi-Domain Network Research, the overall objective is to develop a prototype Multi-Domain Optical Modelling Tool.



In addition the knowledgebase needed to service both photonic services and alien wavelengths in the GÉANT and NREN network.



Topic 8: Alien Wavelengths over the GÉANT Network



Testing alien wavelengths over the GÉANT network. Evaluate whether alien wavelengths should be a service offered by GÉANT



Theme 2: Topics 9-12

Afrodite Sevasti, Activity Leader JRA2

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Topic 9: Network as a Service (NaaS)



- A new network management and provisioning model for the Research and Education networking community, based on infrastructure virtualisation and flexible usage of network infrastructures by users

Objectives

- To create novel and widely accepted usage scenarios for NaaS.
- To strengthen the cooperation between research groups, industry and the GN3plus consortium.
- To design prototypes of NaaS-based functional elements to be utilised in the GN3plus service portfolio.
- To evaluate new service models for NRENs and associated resource access policies based on infrastructure resource capability models (NaaS).

Outputs

- A document describing the design of the proposed solution.
- A software prototype of the proposed solution.
- A document proposing a service model based on the proposed solution.

Budget

- Up to two proposals may be funded, each between €100K and €150K.



Open platform for Network as a Service: <http://www.opennaas.org/>

NaaS use case: The virtual CPE: <http://www.heanet.ie/conferences/2012/talks/id/3>

connect • communicate • collaborate

Topic 10: OGF NSI Compliance Testing Suite



Overview

- OGF NSI as a multi-domain circuit provisioning protocol.
- Currently at NSI Version 2.0.
- In order to ease and boost the adoption of NSI by RENs, this work area invites proposals to design and develop a conformance test suite (CTS) for BoD systems to test their adherence to the OGF NSI framework.
- The CTS should be run against NSI v2.0
- Load testing by the CTS would also be recommended.
- The CTS could be used as a formal reference implementation

Objectives

- To provide documentation of scenarios and tools for NSI protocol conformance testing.
- To provide a validation tool for BoD systems in use within the GN3plus community environment.
- Promote the adoption of NSI.



Topic 10: OGF NSI Compliance Testing Suite



Outputs

- A document that describes the design of the CTS.
- A software prototype of the CTS.
- Documentation on how to use the CTS.

Evaluation:

- Ease of deployment and Scalability
- Maintainability
- Ease of use
- Test coverage (i.e. proportion of NSI functionality tested).

Budget

- One proposal may be funded with a total budget of between €100K and €130K.



- How the Research and Education Networks (RENs) can be engineered to address CDNs
 - Concepts such as ‘Science CDN’ or ‘Big Data’ distribution.
 - Identification of use cases, business opportunities and specialised requirements
 - Technologies (such as named data networking) and technical capabilities required by RENs
 - Prototyping of a proposed solution



Objective

- To identify how REN capabilities can be engineered to support CDN services and, as a result, investigate the possibilities for adding CDN-related offerings to the GÉANT-NREN service portfolio.

Outputs

- A document describing use cases, business opportunities and any specialised requirements for CDN services, as well as relevant technologies.
- A trial of a prototype or pre-existing (but customised to R&E community environment) proposed solution over GÉANT and interested NRENs.

Budget

- One proposal may be funded with a budget of between €100K and €200K.



- Tight integration of persistent services with network capabilities in the backbone such as fault tolerance mechanisms, optimisation of latency issues and network-topology-conscious services
 - Using routing protocols to signal instance availabilities.
 - Horizontal scaling.
 - Support for physical and geographical distribution of data and instances in a way that is congruent with the physical network in an intelligent way.
 - Support for continuous replication of data.
 - Support for seamless and rapid handover and recovery.
 - Support for forgiving and self-repairing synchronisation mechanisms



Objectives

- To explore and research high-availability methods/technologies.
- To port one or more applications to multi-instance versions for high-availability demonstrators.

Outputs

- A report describing the relevant technologies (for example: high availability architectures and protocol extensions, fault tolerance mechanisms, optimisation of latency techniques, network-topology conscious capabilities).
- A high-availability demonstrator involving the porting of at least two applications to multi-instance versions.
- Key findings of the research to be published in one or more peer-reviewed journals.

Budget

- One proposal may be funded, with a total budget of between €100K and €150K.



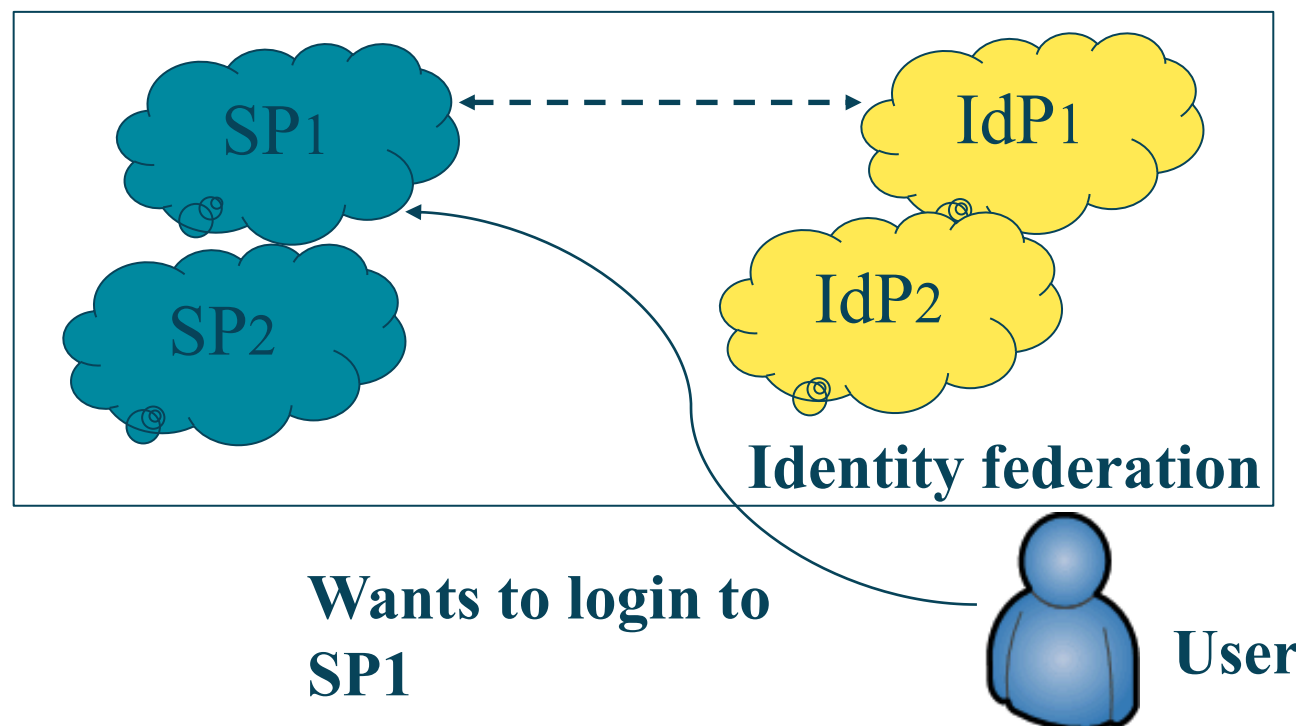
Theme 2: Topics 13-17

Licia Florio: Activity Leader JRA3

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Topic 13: New Protocols for Dynamically Building Trust

Today



Typically the 'trust' is established at federation level with a mix of policies and technologies

- *The user is not involved*



Topic 13: New Protocols for Dynamically Building Trust



● Objectives:

- Propose a new trust model where the users can be involved in establishing trust relationships between user's IdPs and the SPs
- Explore support of technologies such as Account Chooser and Kantara UMA

● Output:

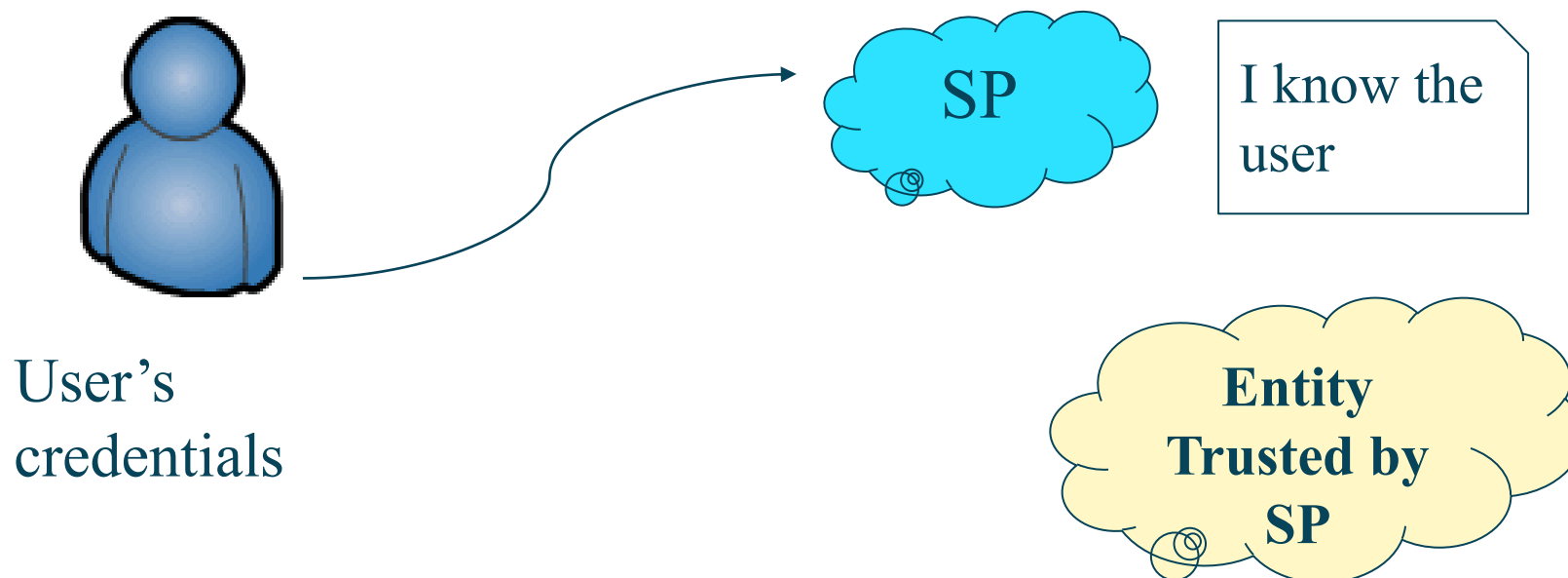
- **Protocol specifications** to enable the envisioned dynamic trust building process
 - *Engagement with the IETF for the standardisation of the protocol*
- **Proof of concept(s)** of the proposed protocol

● Budget:

- Between 100K and 200K



Topic 14: Authentication Mechanism Supporting Higher LoA



Would the SP increase their trust in the credentials of the user if a trusted entity could vouch for them?



Topic 14: Authentication Mechanism Supporting Higher LoA



Objectives:

- To present one or more models to implement a reputation system (i.e. web of trust model) to increase the LoA associated with identities
- To evaluate stronger authentication mechanisms, including multi-factor authentication, and their usability in identity federations.

Output:

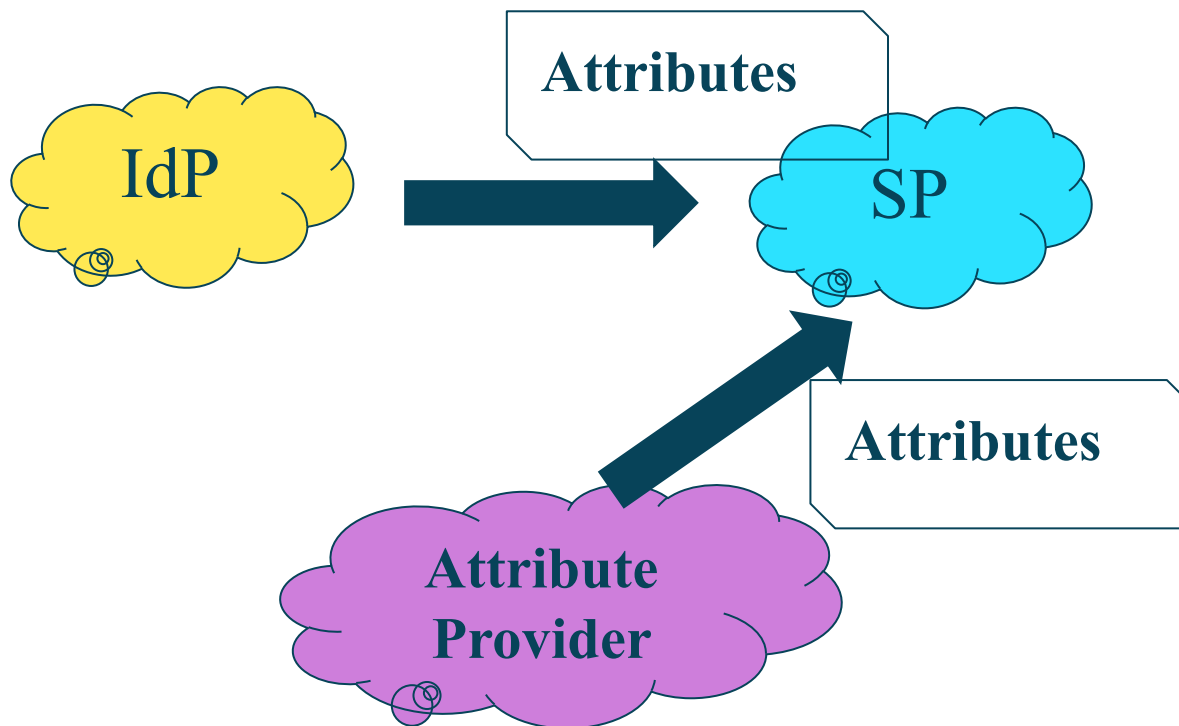
- **A report** evaluating authentication mechanisms, including multi-factor authentication implementations to support higher LoA.
- **A protocol** to implement the envisioned model
- Provide **proof-of-concept** for the proposed protocol

Budget



- Total budget of between €100K and €150K.

Topic 15: Building Support for External Attribute Authorities in H&E



Topic 15: Building Support for External Attribute Authorities in H&E



Objectives:

- Analyse ways to implement support for attribute providers in a inter-federation scenario:
 - Address possible issues with privacy regulations when attributes are provided by third parties
 - Address possible implications on attributes namespaces

Output:

- A **report** including the results of the analysis above
- Guidelines for HE federations to support third parties attribute providers based on the proposed model
- One (or more) **proof-of-concept** for one of the proposed model(s).

Budget:

- Between €100K and €200K



Overview

- 802.1x and EAP are widely used protocols
- EAP leaves many degrees of freedom for implementers (EAP type support; checking security parameters, etc.)
- Ease of use of user interfaces varies greatly
- Device vendor implementation choices must meet IdP server deployment choices, or else no service for end user
- **Existing implementations differ significantly in their user interface, manual configurability, automatic provisioning capabilities, and technical completeness**



Objectives

- To establish a forum of experts setting out minimal requirements for a user-friendly implementation of IEEE 802.1X supplicants, EAP peers and EAP servers
- To work with as many implementers of IEEE 802.1X / EAP as possible to improve existing implementations to support minimum requirements
- To create a knowledge base with tips and checklists for future implementers

Output

- A **reference checklist** to describe the minimum level of usability and implementation completeness. This would lead to the creation of a quality label “User-Friendly & Complete IEEE 802.1X supplicant“, “Interoperable EAP server for EAP Types x,y,z”.
- A **reference implementation**, supported by **one or more proof-of-concept(s)**.
- Improved supplicant software from many implementers of such software.

Budget

Between €100K and €350K.



Topic 17: Scalable Ubiquitous Access to Networks and Cloud Services



Objective

- Investigate the usage of emerging protocols for scalable and secure ubiquitous access to cloud services and network functions.
- Enable Single Sign On to applications and network services
 - *But many applications and network services use other native protocols*

Output

- **Prototype deployment**
- A **guide** on applying ABFAB or other emerging protocols to enable SSO for heterogeneous cloud services.

Budget

- €100K and €200K.



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- **Not fully “open” – must be relevant to R&E networking!**
- Primary objectives:
 - to enhance the ability of the GÉANT and NREN networks to provide world class connectivity and services to their user communities
 - to push the state of the art in Research and Education networking
 - to raise GÉANT’s profile in the area of networking research through the publication of research results
- It is expected that:
 - the work carried out will demonstrate high levels of innovation
 - provide the GN3plus project with new and novel research results that can be applied to a multi-domain networking environment



Given for guidance BUT not limited to:

- Hardening network management
- Deterministic multi-domain networking
- Networking without borders



Topic 18: Hardening network management



- The aim is support research into novel technologies and methods which will improve the resilience and stability of the combined GÉANT and NREN network domains
- Monitoring can be included in the broadest sense and could include:
 - monitoring by network providers for the purposes of maintenance
 - technology to allow users to monitor their services
- Work in this topic can include, but is not restricted to:
 - Multi-domain network monitoring and management
 - Multi-domain virtual private network user monitoring



Topic 18: Deterministic behaviour of multi-domain networks



- aim is to support research into novel technologies and methods which will enhance the performance of the GÉANT network (both packet and circuit based).
- This can include, but is not restricted to:
 - **Routing protocols and architectures** including clean slate routing approaches, protocol routing extensions, provably correct routing behaviour, meta and namespace routing and novel constraint based routing behaviour (e.g. routing for CO2 reduction)
 - **Programmability of networks and associated control planes** e.g. to realize hybrid distributed/centralised control plane architectures, network programmability and elasticity, integration of virtualized connectivity, computation and storage
 - **Hardware development** based on commercial off-the-shelf components and enabling very high-speed, low-cost, open and flexible communication platforms for R&E



- The aim is to support research into novel technologies and methods to improve the mobility of research and education networking.
- This can include, but is not restricted to:
 - Improved security, authentication and provisioning mechanism, especially in a virtual environment operating in a multi-domain environment
 - Innovative use of remote data access for high performance computing applications
 - Integration of eScience clouds with multi domain reservation and provisioning services
 - Integration of Resources on Demand (reservation and provisioning) across instruments, networks and eScience services



Theme 3 – A little more guidance



- **Bear in mind that:**
 - Proposers should demonstrate that their research results provide added value for the R&E networking community in terms of innovative services and standards
- **Note that:**
 - Where appropriate, proposers may choose to make use of the GÉANT testbed facilities described in Theme 1 (DF testbed Topic 1, OpenFlow facility, Topic 2)
- Only proposals which demonstrate a very high level of innovation are expected to be submitted with a budget of €350k



Agenda

- Introduction to DANTE and GÉANT
- The GN3 Plus project
- GÉANT Open Calls
 - Theme 1
 - Theme 2
 - Theme 3
- **Process & Timetable**
- Questions and Answers



Process & Timetable

19th April 2013

- Eligibility checks.....
 - ✓ Electronic submission in PDF format by 29th May (17:00 Brussels time)
 - ✓ Only proposals in English can be accepted
 - ✓ Part A (administrative info) and Part B (proposal info) both completed
 - ✓ In scope of the call and Topic
- www.geant.net/opencalls “How to Submit a Proposal” section
- “Guide for Applicants” (39 pages) has been prepared – DO NOT SUBMIT A PROPOSAL WITHOUT HAVING READ THIS!



Proposals evaluated by at least 2 independent experts – 3 key areas.....

1. Scientific and technical quality

Threshold 3/5

2. Implementation

Threshold 3/5

3. Impact

Threshold 3/5

Total = Overall score

Threshold 10/15



- The framework programme financial provisions apply
- Activities are likely to be primarily RTD activities with an overall reimbursement rate of 50% - 75% depending on the type of proposer
- Successful proposers will receive clear guidance at GN3plus project symposium in Vienna (early October) on:
 - ✓ *Cost claims – timing and how to submit*
 - ✓ *Project reporting – templates and when to submit*



What costs are eligible?

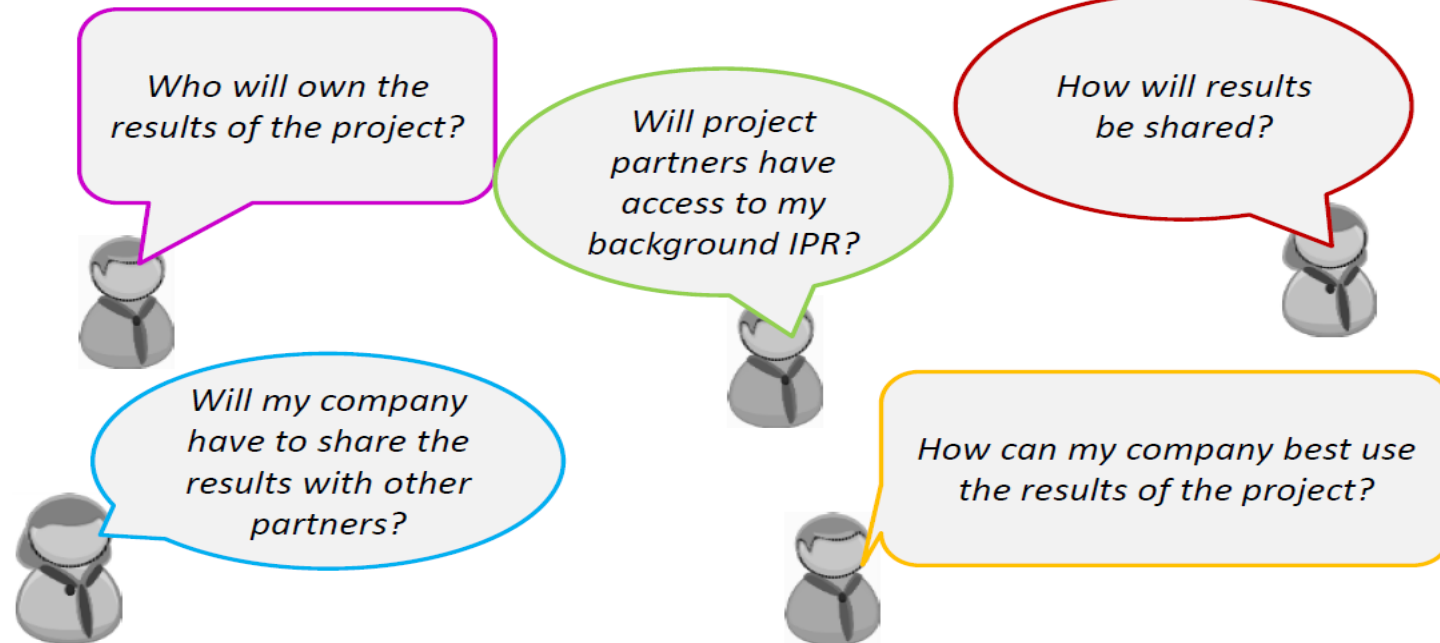
All participants report direct and indirect (overhead) **eligible** costs

Eligible costs

- Actual
- Incurred during the project
- Determined according to usual accounting and management principles/practices
- Used solely to achieve project objectives
- Consistent with principles of economy, efficiency and effectiveness
- Recorded in accounts (or the accounts of third parties)



Participants' concerns...



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Phone +352 25 22 33-333 (Helpline)

service@iprhelppdesk.eu



Open Call Schedule

The following table outlines the planned schedule (subject to change) of the first GÉANT (GN3plus) Open Call:

Activity/Milestone	Start
Call opens	1 April 2013
Deadline for proposal submissions	29 May 2013
Proposal evaluation	3 June – 12 July 2013
Evaluation report sent to all proposers	Week of 15 July 2013
Discussion to agree deliverables	September 2013
Endorsement by GN3plus consortium and signature of agreements	Early October 2013
Welcome to GN3plus at Project Symposium and Work starts	Early October 2013

New beneficiaries are expected to attend the Project Symposium held in Vienna, Austria



Summary



Project acronym	GN3plus
Project grant agreement number	605243
Project full name	Multi-Gigabit European Research and Education Network and Associated Services
Call open	The call opens on 1 April 2013
Deadline	The call closes on May 29, 2013 at 17h00 (Brussels time)
Expected duration of participation in project	October 2013 to the end of March 2015
Proposal format	Proposals can include one or more organisations eligible for EC funding
Indicative total EC funding available	3.3M€
Call identifier	GN3PLUS: Open Call for additional beneficiaries
Language in which proposal should be submitted	English
Web address for further information	www.geant.net/opencalls



Questions and Answers

Any further questions please email: opencalls@geant.net