

GN3plus JRA 1

Network architectures for Horizon 2020

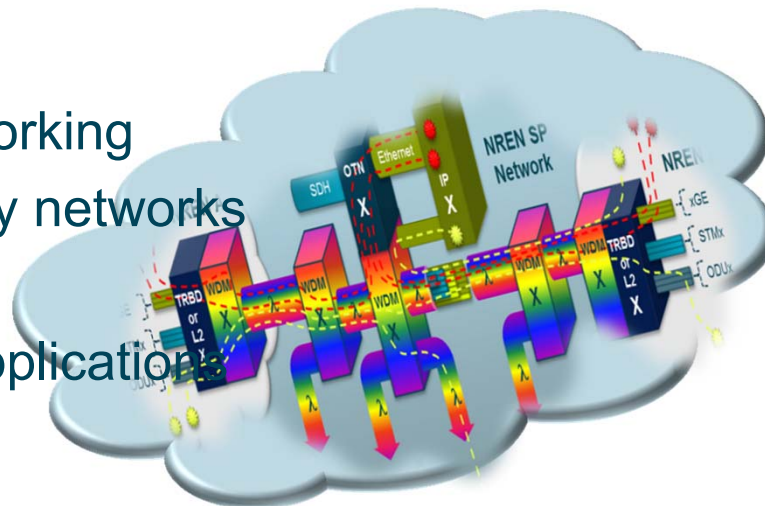
Tony Breach, NORDUnet A/S

2nd TERENA Network Architects Workshopp
Prague, 13-14th of November 2013

JRA1 Background



- One of the output from GN3 was an upgrade of the network to the latest transmission and switching technology
 - Massive increased capacity across the network
 - Still based on the **same** basic network architecture philosophy
- Demands are increasing fast, can this architecture philosophy survive – Can it support the future:
 - Cloud services
 - High-speed mobile networking
 - Scientific content delivery networks
 - Sensor networks
 - Emerging service and application



JRA1 Objective



GN3plus JRA1 will providing a set of architectural proposals for GÉANT & NRENs



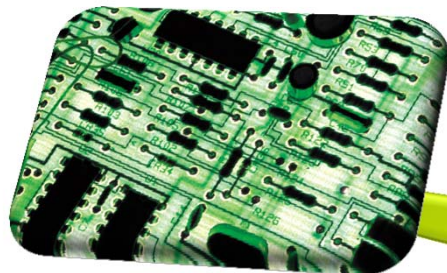
Cloud Architecture



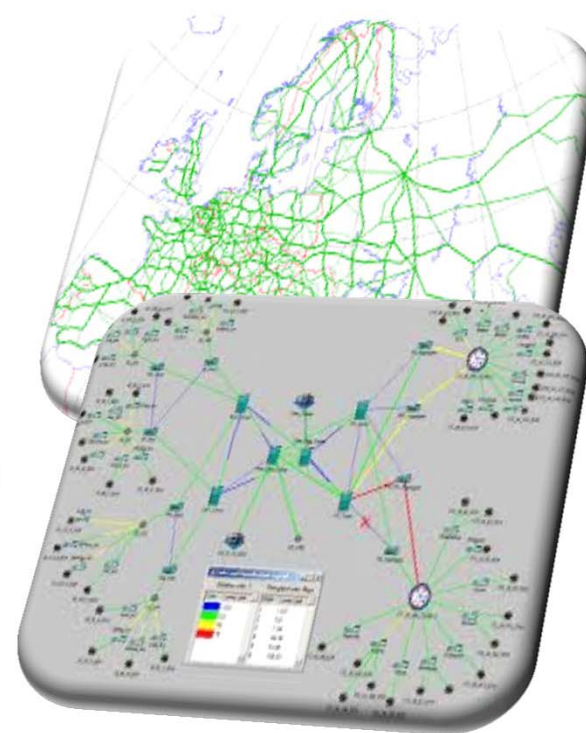
Novel Architecture



Mobility Architecture



Open Call



Architectural Design

Open Call Project Overview



1. Photonic Level Access to Long Haul Dark Fibre - use of GEANT's Dark Fibre Test bed
2. Software Defined Networking – use of GEANT's Open Flow facility
3. Novel uses of Dynamic Circuits (Bandwidth on Demand)
4. Terabit Transmission Trial
5. Clean Slate Architecture
6. Flexible Optical Network
7. Multi-Domain Optical Modelling Tool
8. Alien Wavelength over GÉANT
9. Network as a Service (NaaS)
10. OGF NSI compliant CTS
11. CDN capabilities for RENs
12. High-Availability Networking
13. Dynamic trust building protocol
14. Authentication mechanism supporting higher Level of Assurance
15. Building support for external Attribute Authorities in HE Federations
16. IEEE802.1X and EAP - Standards based approach
17. Scalable ubiquitous access to networks and cloud



JRA1

Open Calls Projects related to JRA1

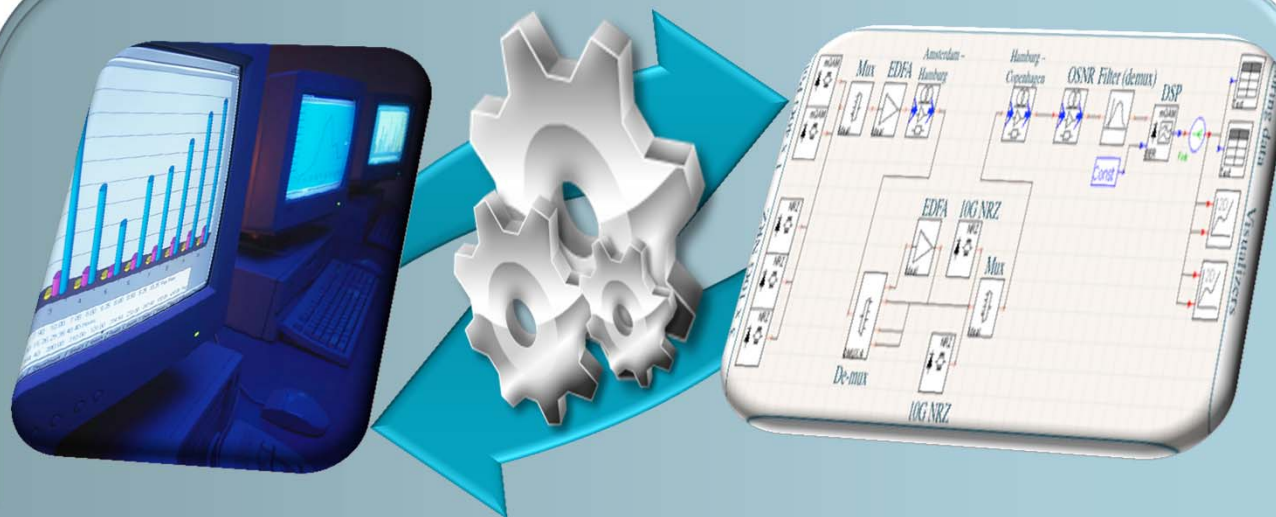


Clean Slate
Network
Architecture

Flexible
Optical
Network

Multi-Domain
Optical
Modelling Tool

Area
Wave length
over GÉANT



MOMoT Multi-Domain Optical Modelling Tool

- DTU Denmark
- GWDG Germany

JRA1 How to archive the Objective



Designs could be amendments to the current architecture - clean-slate architecture or something in between.

Research network architectural designs better suited to a broader range of emerging services than the current architecture.

This work should support and pave the way for the GÉANT and NREN architecture approach until the end of Horizon 2020.

- Desktop Study
- GN3 JRA1 work
- Industry and NREN
- Architectural workshops
- Test and Demonstration



JRA1 Deliverables



- Task 1 will be the main deliverable incorporating the deliverables of Tasks 2, 3 and the OC
- Providing a complete set of architectural proposals for GÉANT and the NREN community
 - Provides ideas for how to plan the network architecture towards Horizon 2020
 - The results and findings will be supported by test and/or demonstration cases
- Deliverables
 - Quality reports for GÉANT and NREN community supported by test and demonstration cases
 - One common high-quality presentation pack for dissemination of the overall results of JRA1



JRA1 Beneficiary



JRA1

SA1: Network

SA1: Core Backbone Services

SA1

Provide technical insight about how to build the future network

SA2

Utilize the common test pan-European facility

SA4: Network Support Services

SA7

Support the Cloud and Mobility initiatives with arch. recommendations

SA5: Terminologies

JRA2

Collaborate on the SDN related part regarding network architectures

SA6: Service Management & Operation

GN3plus community

Provide insight in relation to architecture trends

SA3: Governance

& Promotion

SA2: Policies

Business Devpt

JRA1 Overview



- Current work schedule will end in month 24
- Manpower equal to 189 MM
- 16 partners and 2 subcontractors
- 28 Participants



connect • communicate • collaborate

JRA1 Manpower Outline



Henrik Wessing, Task Leader
Future Network Architectures

Task 1

Kurosh Bozorgebrahimi
Josef Vojtěch
Martin Dunmore
Andreas Metz - IRT

UNINETT
CESNET
JAnet
DFN

Bartosz Belter PSNC
Anna Tzanakaki University of Bristol
Alberto Colmenero NORDUnet



Damir Regvart, Task Leader
Network Architectures for Cloud Services

Task 2

Sonja Filiposka
Pavel Škoda
Migiel de Vos
Yuri Demchenko – UVA

MARNET
CESNET
SURFnet
SURFnet

Daniel Arbel
Tasos Karaliotas
Kurt Baumann

IUCC
GRNET
SWITCH

JRA1 Manpower Outline



Raimundas Tuminauskas, Task Leader

Task 3

Network Arch. for Aggregating High-Speed Mobile Networking

Hao Yu; DTU

NORDUnet

Chrysostomos Tziouvaras GRNET

Zbigniew Ołtuszyk

PSNC

Marcin Garstka

PSNC

Nicolas Garnier

RENATER

Frans Panken

SURFnet

Pedro Lorga

FCCN

Yuri Demchenko – UVA

SURFnet



Paul van Daalen, OC Coordinator

OC JRA1

Single and Multi-Domain Network Research



Neringa Jackevic, Admin Leader

Task 0



Tony Breach, Activity Leader

Task 0



Any Questions...