Orchestration, Automation and Virtualisation (OAV) in Network Technologies and Services Development GN4-3 WP6

Ivana Golub, PSNC
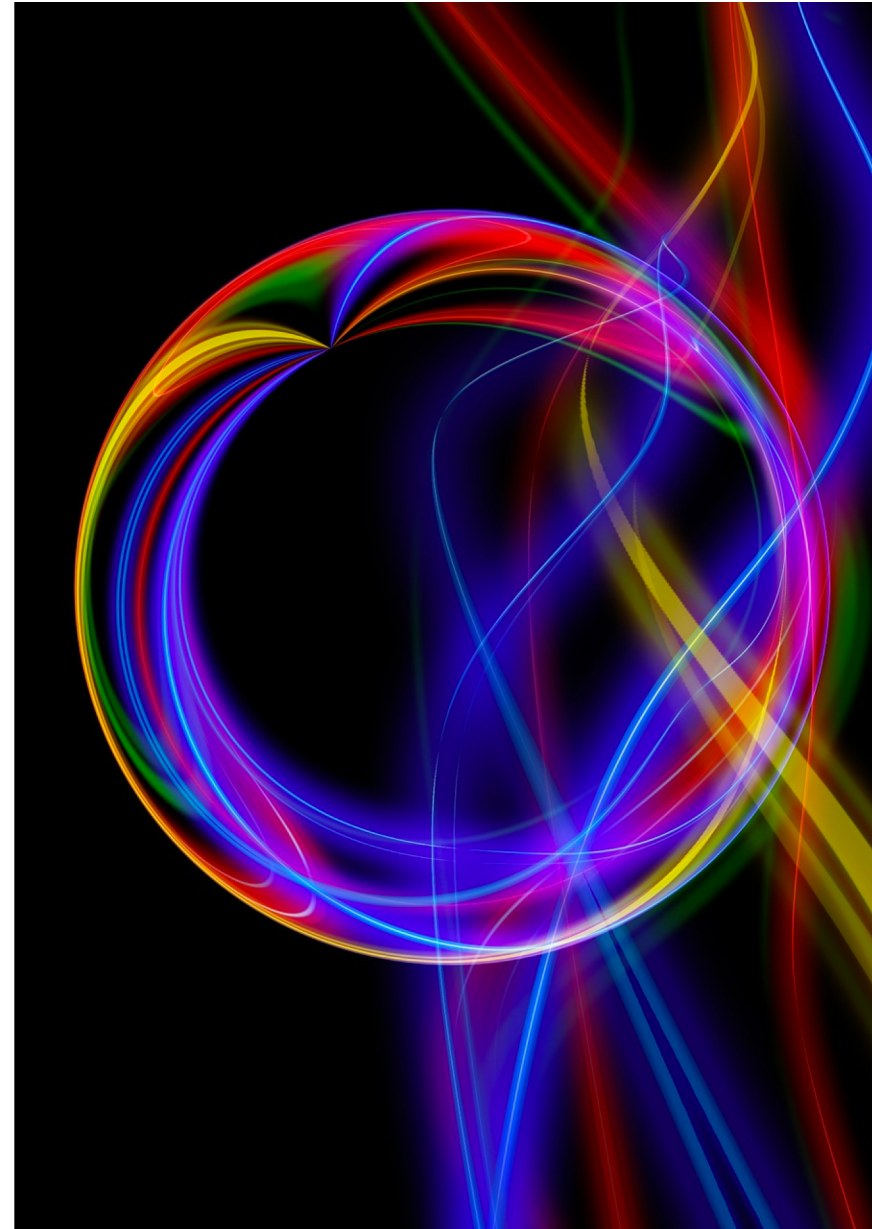
TNC19

18 June 2019

Agenda

- GÉANT Project Overview and Structure
- Network Technologies and Services Development Work Package
- Orchestration, Automation and Virtualisation in WP6
- Next Steps

GÉANT Project Overview and Structure

GÉANT Project

GÉANT's vision is to ensure equal network access for all scientists across Europe to the research infrastructures and the e-infrastructure resources available to them.

- A part of the European Union's Horizon 2020 research and innovation programme
  - GÉANT 2020 Framework Partnership Agreement (FPA)
  - Grant Agreement No. 731122 - GN4-2
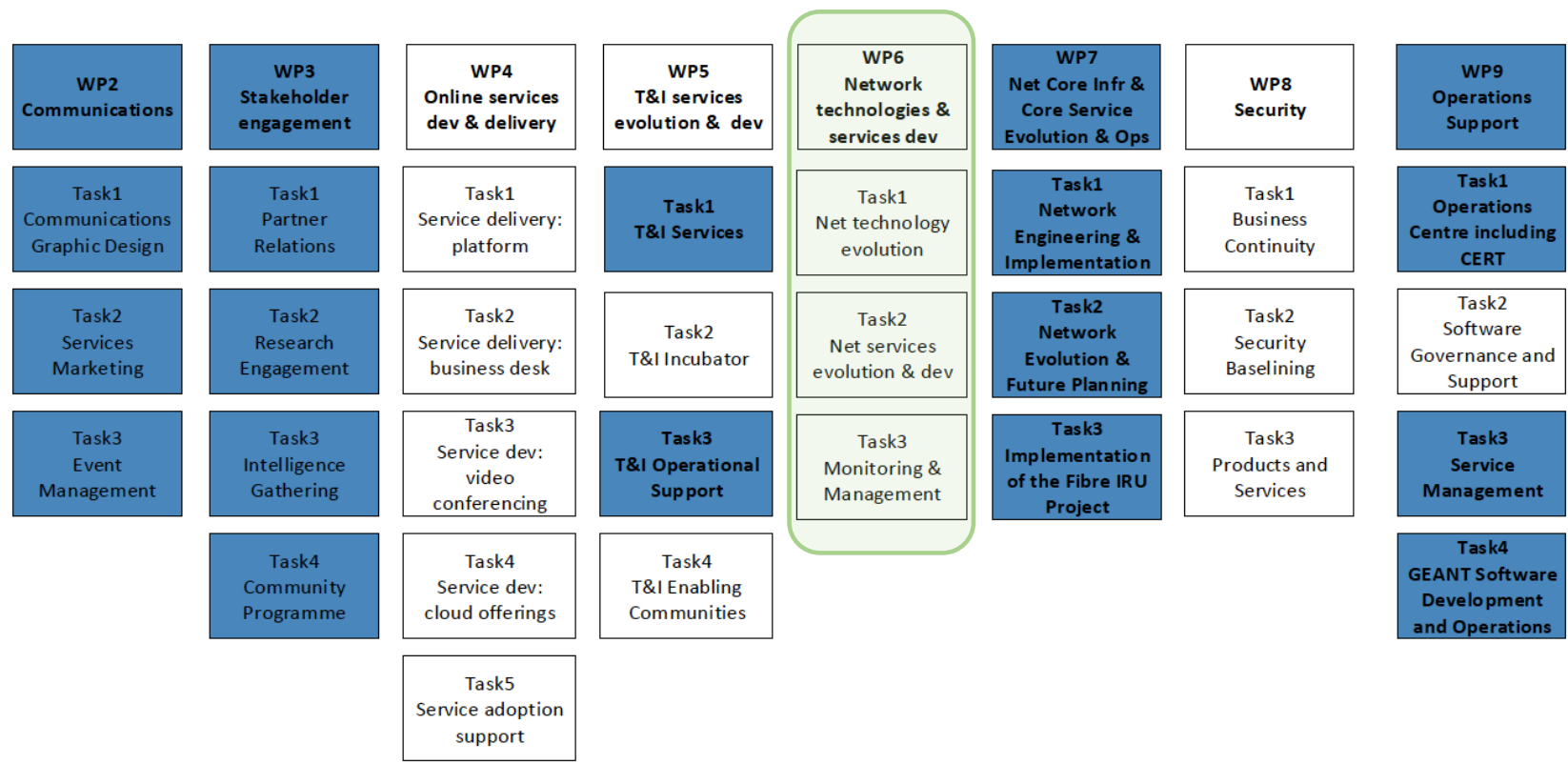- 40 partners, 500 contributors

- 50 M users

GN4-3 starts 1 Jan 2019 as 4 year project

GÉANT Project Structure

WP2 Communications	WP3 Stakeholder engagement	WP4 Online services dev & delivery	WP5 T&I services evolution & dev	WP6 Network technologies & services dev	WP7 Net Core Infr & Core Service Evolution & Ops	WP8 Security	WP9 Operations Support
Task1 Communications Graphic Design	Task1 Partner Relations	Task1 Service delivery: platform	Task1 T&I Services	Task1 Net technology evolution	Task1 Network Engineering & Implementation	Task1 Business Continuity	Task1 Operations Centre including CERT
Task2 Services Marketing	Task2 Research Engagement	Task2 Service delivery: business desk	Task2 T&I Incubator	Task2 Net services evolution & dev	Task2 Network Evolution & Future Planning	Task2 Security Baselining	Task2 Software Governance and Support
Task3 Event Management	Task3 Intelligence Gathering	Task3 Service dev: video conferencing	Task3 T&I Operational Support	Task3 Monitoring & Management	Task3 Implementation of the Fibre IRU Project	Task3 Products and Services	Task3 Service Management
	Task4 Community Programme	Task4 Service dev: cloud offerings	Task4 T&I Enabling Communities				Task4 GEANT Software Development and Operations
		Task5 Service adoption support					

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Network Technologies and Services Development
GÉANT4-3 Project Work Package

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Network Technologies and Services Development Work Package

- Project code - Work Package 6 (WP6)
- Focusing on new technologies and services
  - Enhancing existing / creating new services
  - Reaching consensus on the future direction
  - Promoting wider adoption of general principles
- Work Package Leaders:
  - **Tim Chown – Jisc**
  - **Ivana Golub – PSNC**
- WP6 budget: just over €6,2m
- 78 team members from 33 organisations from 23 countries

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WP6 Structure

- 3 Tasks + Management task (Task 0)

- **Task 1: Network Technology Evolution**

    - Task Leader: **Xavier Jeannin (Renater)**

- **Task 2: Network Services Evolution and Development**

    - Task Leader: **Roman Lapacz (PSNC)**

- **Task 3: Monitoring and Management**

    - Task Leader: **Pavle Vuletić (UoB/AMRES)**

Task 1: Network Technology Evolution

- **Identifying** and **prototyping** potential **new technologies**

- Developing successful **prototypes towards a full service**

- Identifying research and/or development activities that could help **enhance production** application services and infrastructure

- Topics:
    - **Low-latency data transfer (LoLa)**
    - **White box (WB)**
    - **Data plane programmability (DPP)**
    - **Data Transfer Node (DTN) stimulation**
    - **Optical Time and Frequency Networks (OTFN)**
    - **Quantum Key Distribution and Exchange (QK D&E)**

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Task 2: Network Services Evolution and Development

- Evaluating **existing services** and their usage for particular use cases

- Exploring mechanisms to **orchestrate and automate** the deployment and management of services

- Extending and further developing the **Self-Service Portal (SSP)** based on WP7 inputs

- Identifying opportunities for the deployment of new network services.

- Additional future work to be defined:
  - Depending on agreed use cases
  - Depending on the inputs from the community

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Task 3: Monitoring and Management

- **Continued development** and evolution of monitoring and management tools and services:
    - **perfSONAR**
    - **NMaaS**
    - **NetMon**
    - **WiFiMon**
    - **Performance Measurement Platform (PMP)**
- **Campus network** monitoring and management ("CNaaS", "CNMaaS")
- New work opportunities explored through the **incubator** team

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Orchestration, Automation and Virtualisation in WP6

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Current Status

- Consensus building team formed out of 12 people from 8 countries

- NREN OAV Survey
  - 31 organisations participated in the Survey

- Co-organised GN4-3 Future Service Strategy Workshop
  - Automation, Orchestration and Virtualisation in GÉANT Community

- TNC19: Orchestration, Automation and Virtualisation (OAV) BoF
  - Here today ☺

Survey Objectives

- **Learn about the strategy and actions of each NREN** related to network and service orchestration, automation and virtualisation (OAV)

- **Explore** if there are **common use cases, ideas, needs and issues** in the community in the areas of automation, orchestration and virtualisation

- **Recognise possible areas of collaboration** both amongst NRENs and between NRENs and GÉANT

- **Determine and recommend possible future work** within Work Package 6 (or other WPs) of the GÉANT GN4-3 project that could be of benefit to as many partners as possible for identified use case(s)

Survey

- Areas:
  - Existing platform
  - Current OAV use cases
  - Future OAV use cases
  - Challenges in adopting OAV
  - How GÉANT might help NRENs
- Results:
  - Presented at the workshop and served as a starting point for the discussion
  - https://wiki.geant.org/pages/viewpage.action?spaceKey=gn43wp3&title=GN4-3+Future+Service+Strategy+Workshop

Survey Results Interpretation

- NREN has common pain points:
  - lack of appropriate manpower, time, cost, priorities,...
- Wide variety of components and systems in use
- No obvious common single direction or best practice for OAV
- Opportunity exists for work on BSS and OSS – BSS integration
- Most important OAV use cases for NRENs are Configuration integrity, Problem troubleshooting and Security operations centre enhancements
- Current NREN focus is more on providing their own services, rather than brokering services from other service providers

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OAV Workshop

- 70 representatives in person and remote

- 34 NRENs and affiliated organisations

- Objectives:
  - Present the survey results
  - Gather the feedback about the immediate next steps
  - Gather the feedback about longer term vision

- Groups discussions – on site and remote participants

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OAV Workshop Outcomes

- High interest for the OAV topics
- NRENs are at different stages of their OAV journeys
- Scope exists for greater collaboration between NRENs
- There is no "one size fits all" solution
- Common terminology should be agreed
- No reinventing the wheel
- Interest exists for the OAV for connectivity services
- Initial focus is "intra-domain"
- Value, uptake and sustainability are important for our OAV work

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Next Steps

Next Steps

- Focus groups
    - Developing common terminology and a "reference architecture / framework"
    - Exploring use case(s)
- Knowledge sharing/exchange
    - InfoShares – strategic and technical
    - Tools Repository – possibly GÉANT GitLab
    - Open Wiki – https://wiki.geant.org/display/OAV
    - Continue the discussion: TNC19 OAV BoF today, STF July 3-4

Conclusions

- GN4-3 Network Technologies and Services Development Work Package wants to raise the level of OAV in the community

- Numerous differences require individual approach – per NREN, per use-case

- Future work in the areas:
  - Focus groups
  - Knowledge sharing/exchange

- TNC19 OAV BoF is the immediate result of the inputs from the survey and the workshop

Thank you

Any questions?

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igolub@man.poznan.pl