



GN4-3 WP6 Update

Network Technologies and Services Development

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STF Meeting, 25 Feb 2021, Online

www.geant.org

Today's update



GN4-3 started in Jan 2019, and runs to Dec 2022
82 people in WP6 from 34 organisations in 26 strands of work



This talk will highlight opportunities for you to get involved,
test new technologies and deploy new services



Mauro will then present in detail on one specific example – In-band Network Telemetry (INT)

WP6 – current structure and work items

T1: Network Technology Evolution

- Low Latency networking (LoLa)
- Optical Time and Frequency Networking (OTFN)
- White box networking for R&E use cases
 - CPE Normandy, RENATER
 - Internet Exchange Point (IXP), RENATER
 - CPE, FUNET
 - Data centre, GRNET
 - White box performance testing, PSNC
- Router for Academia, Research and Education (RARE)
- Data Plane Programming (DPP)
- Quantum Key Distribution (QKD)

T2: Network Services Evolution and Development

- Service Provider Architecture (SPA)
- Orchestration, Automation and Virtualisation (OAV)
 - Architecture
 - Training
 - Wiki with the Community Portal
 - Campus Network Management as a Service (CNaaS)

T3: Monitoring and Management

- perfSONAR
- perfSONAR Consultancy
- Performance Measurement Platform (PMP)
- Network Management as a Service (NMaaS)
- WiFiMon
- Network Telemetry

WP6 umbrella page:

<https://wiki.geant.org/display/NETDEV>

Task 1 – Network Technology Evolution

Low Latency Networking **LoLa**

- Seeking better monitoring capabilities for real-time applications
- Built GÉANT backbone network per-segment jitter weather-map prototype
- Available at <https://timemap.geant.org/> (right click links for details)
- **Looking for NRENs interested in implementing this in their backbones**

Optical Time and Frequency Networking **OTFN**

- Testing in progress, in GÉANT, and around NREN interconnectivity
- White paper on T&F services in NRENs published – see [White Paper PDF](#)
- **Join our infoshare on 9 March – <https://events.geant.org/event/451/>**
- **Looking to assist NRENs with T&F deployments and possible interconnects**

White Box for R&E networks

- Some use cases complete - [RENATER CPE](#) and IXP in production, and [TCO analysis](#)
- FUNET CPE and GRNET Data Centre solutions in deployment
- New white paper on white box performance testing coming in the next few days
- **Seeking NRENs interested in production white box deployment /performance testing**

Task 1 – Network Technology Evolution

Router for Research and Academia

RARE

- Full-featured open source platform now available – see the [RARE wiki](#)
- Runs FreeRouter control plane with P4 / DPDK data plane
- Distributed P4 Lab set up at 4 GÉANT PoPs; many NRENs/universities joining
- **Looking for NRENs interested in testing RARE and/or joining the P4 Lab**

Data Plane Programming

DPP

- Focused on INT – testbed running between three production NREN networks
- White paper on testbed experience and lessons learned due in next few days
- **Join our infoshare on 2 March - <https://events.geant.org/event/558/>**
- **Seeking NRENs wishing to test INT or deploy it in production environments**

Quantum Key Distribution

QKD

- Produced QKD in the NRENs “state of the art” [white paper](#)
- One general quantum technology infoshare held – [materials available here](#)
- Planned PoC with Toshiba between GÉANT PoPs in late 2021 / early 2022
- **Join our QKD Infoshare on 17 March – <https://events.geant.org/event/453>**

Task 2 – Network Services Evolution and Development

Service Provider
Architecture
SPA

- Development and support to the production GCS service
- Provides TMForum ODA-compliant software tools
- **Considering potential to bundle s/w directly, or as a service**



Orchestration,
Automation,
Virtualisation
OAV

OAV Architecture

- Selected TMForum ODA as a [reference architecture](#) for NRENs
- **Seeking NRENs interested in ODA mapping exercise** – [SURF](#) and [CYNET](#) done

OAV Training

- **Regularly publishing new modules** - [please ask your engineers to look at it](#)

OAV Wiki

- **Seeking NREN material to add to our [OAV Community Portal](#)**

Other documents produced

- Campus Network Management as a Service (CNaaS) Service Definition [template](#)
- OAV Terminology [document](#) published, v1.1 approved by GNA-G automation WG

Contact email – oav@lists.geant.org

Task 3 – Monitoring and Management

perfSONAR

- Well established toolkit for network performance monitoring
- Continued development and support in the Global team, now with RNP
- Major release v4.4 due this summer
- **Join our [2nd European perfSONAR User Workshop](#) on 14-15 April**

perfSONAR Consultancy

- Providing perfSONAR advice and guidance to the GÉANT community
- Typically helping projects or NRENs deploying perfSONAR for specific communities, recently working with RENATER and Jisc
- **If you would like advice, please email perfsonar@lists.geant.org**

Performance Measurement Platform PMP

- Runs [perfSONAR mesh](#) from participating NRENs to GÉANT backbone
- Providing maintenance and support; node replacements in preparation
- **Would like to hear from NRENs how they are using their PMP nodes**
- **Also seeking input for other measurements the PMP nodes could make**

Task 3 – Monitoring and Management

Network Management as a Service NMaaS

- Provides a [portfolio of applications](#) run via a secure, virtual platform
- User base is growing, both within GN4-3 and with NRENs and universities
- **If interested in using NMaaS, please contact nmaas@lists.geant.org**
- **If there are additional tools you'd like us to add, please ask**

WiFiMon

new

- A [new GÉANT service](#) since July 2020
- Provides crowdsourced and/or RPi-based WiFi performance monitoring
- A short [WiFiMon video](#) has been published and an [infoshare](#) held
- **Looking for NRENs to promote WiFiMon to their member organisations**

Network Telemetry

- Published [zero footprint monitoring white paper](#), inc. streaming telemetry
- Held [Telemetry and Big Data Workshop](#) with 130 attendees
- Following up Workshop topics, including sharing of network monitoring data
- **Always interested to hear inputs from NRENs on telemetry requirements**

Further pointers...



WP6 umbrella page

- <https://wiki.geant.org/display/NETDEV/>
- Pointers to all our areas of work



Infoshares and workshops

- INT (2 Mar), OTFN (9 Mar), QKD (17 Mar), NEMMO tools (24 Mar)
- <https://events.geant.org/>



White papers

- White box performance and INT testbed report coming soon!
- <https://www.geant.org/Resources/#white>

Thank you

Any questions?

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