Network Technologies and Services Development - WP6

Current Status

Ivana Golub, WP6 Lead, PSNC
Tim Chown, WP6 Lead, Jisc
Agenda

Current status of the WP6 activities
What went well
What can be improved
T1: Network Technology Evolution
- Low Latency networking (LoLa)
- Optical Time and Frequency Networking (OTFN)
- White box networking
  - 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 Management Platform
- Orchestration, Automation and Virtualisation (OAV)
  - Architecture
  - Training
  - Wiki with the Community Portal
- Campus Network Management as a Service (CNaaS)
- Data Transfer Node Infrastructures (DTN)
- Terminology

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

**Task Leader:** Xavier Jeannin (RENATER)

### Low Latency Networking
**LoLa**
- GÉANT network jitter weather-map prototype: [https://timemap.geant.org/](https://timemap.geant.org/)
- User and uptake engagement in progress

### Optical Time and Frequency Networking
**OTFN**
- Testing in progress: in GÉANT, NREN interconnectivity
- White paper published; infoshare in preparation

### White Box for R&E networks
**White Box for R&E networks**
- RENATER CPE and IXP in production
- FUNET CPE and GRNET Data Centre solutions in deployment
- Performance testing in progress, white paper in preparation

### Router for Research and Academia
**RARE**
- Continued development: new features, new platform, the GÉANT P4 Lab
- Increase in interest continues – Connection with the international P4 testbed

### Data Plane Programming
**DPP**
- INT testing environment running across production NREN infrastructure
- Evaluation of the NRENs' interest in progress

### Quantum Key Distribution
**QKD**
- Collaboration and knowledge sharing – white paper, infoshares
- Technology evaluation; planned proof of concept with Toshiba
Task 2: Network Services Evolution and Development
Task Leader: Roman Lapacz (PSNC)

Service Provider Architecture
SPA

- Continued development and support to the GCS service
- Service promotion – wiki, events
- Migrated to the new production and testing infrastructure

Orchestration, Automation, Virtualisation
OAV

Led by Maria Isabel Gandia Carriedo (CSUC/RedIRIS)

OAV focus groups status:
- Architecture – NREN-ODA mapping in progress, more white papers to come
- Training – regularly publishing new modules
- Wiki – new content, updating, enhancing
- Campus Network management as a Service (CNaaS) – coordination and promotion of individual NRENs’ efforts

Completed OAV focus groups:
- Data Transfer Nodes (DTN) – reported in a white paper and an infoshare
- Terminology – accepted by the GNA-G Automation WG, new version published
## Task 3: Monitoring and Management

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

### perfSONAR
- Continued development and support in the Global team; RNP – new partner
- 2nd European perfSONAR User Workshop preparation in progress

### perfSONAR Consultancy
- Providing support to the GÉANT community
- RENATER, Jisc

### Performance Measurement Platform (PMP)
- Continued maintenance and support
- Node replacements in preparation

### Network Management as a Service (NMaaS)
- Continued development and maintenance: new features, new tools
- User support, uptake increase due to the collaboration with RARE

### WiFiMon
- New installations in preparation in RASH, GRENA, UoB
- Collaboration with eduroam initiated

### Network Telemetry
- In-band Network Telemetry (INT) testing for network service monitoring
- New testbed is being built on GTS
What went well

**WP6 team members engagement and collaboration**
- Positive approach and strong engagement of most of the team members: 82 persons, 34 organisations, 23 countries, 21 partner
- 6 Deliverables and 7 Milestones delivered on time
- (Mostly) Recovering from staff leaving
- All KPIs exceeded

**Dissemination:**
- **12** white papers/documents published
- **46** events, out of which **20** are organised and **3** co-organised by WP6
Areas for improvement

• Recovering NREN underspend - enabling agility in work items
  • Total projected WP6 underspend estimated to be approx 500,000 EUR
  • BUT no or slow response from NRENs when contacted about the underspend

• NREN engagement - improving uptake and increasing value
  • Attendance at the infoshares is good, however
  • Solicitation for use cases and invitations for participation mostly end up with silence
  • Promotion to NREN institutions (user sites) and individuals; particularly for WiFiMon and NMaaS

Help needed!
Thank you
Any questions?

As part of the GÉANT 2020 Framework Partnership Agreement (FPA), the project receives funding from the European Union’s Horizon 2020 research and innovation programme under Grant Agreement No. 856726 (GN4-3).
Network Technologies and Services Development - WP6
Looking ahead 2021

Ivana Golub, WP6 Lead, PSNC
Tim Chown, WP6 Lead, Jisc

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Agenda

Y3 plans for the WP6 activities

What we need help with
**T1: Network Technology Evolution**
- Low Latency networking (LoLa)
- Optical Time and Frequency Networking (OTFN)
- White box networking
  - Internet Exchange Point (IXP), RENATER
  - CPE, FUNET
  - Data centre, GRNET
  - White box performance testing, PSNC
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**T2: Network Services Evolution and Development**
- Service Management Platform
- Orchestration, Automation and Virtualisation (OAV)
  - Architecture
  - Training
  - Wiki with the Community Portal
  - Campus Network Management as a Service (CNaaS)

**T3: Monitoring and Management**
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- Network Telemetry

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# Task 1: Network Technology Evolution

**Task Leader:** Xavier Jeannin (RENATER)

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
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<tbody>
<tr>
<td>Low Latency networking</td>
<td>• Continue the work on the weather-map&lt;br&gt;• Working with GÉANT and NRENs for uptake in their environment</td>
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<tr>
<td>Optical Time and Frequency Networking</td>
<td>• Continue testing: in GÉANT, NREN interconnectivity&lt;br&gt;• More infoshares and collaboration</td>
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<tr>
<td>White Box</td>
<td>• White box evaluation and performance verification&lt;br&gt;• Finalising use cases (FUNET, GRNET, RENATER IX) and white papers; dissemination</td>
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<td>Router for Research and Academia</td>
<td>• Continued development: new features, new platform, the GÉANT P4 Lab&lt;br&gt;• User engagement and promotion</td>
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<td>Data Plane Programming</td>
<td>• Tests extended in scope: protocol, platform; release code publicly&lt;br&gt;• Evaluation of NREN interest to extend work</td>
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<tr>
<td>Quantum Key Distribution</td>
<td>• Collaboration and knowledge sharing – white paper, infoshares&lt;br&gt;• Technology evaluation; proof of concept with Toshiba on GÉANT fibre</td>
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### Task 2: Network Services Evolution and Development

**Task Leader:** Roman Lapacza (PSNC)

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<th>Service Provider Architecture (SPA)</th>
<th>OAV focus groups in Year 3:</th>
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<tr>
<td>Continued development and support to the GCS service</td>
<td><strong>Architecture</strong> – continue NREN-ODA mapping, white papers</td>
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<td>Service promotion – wiki, events</td>
<td><strong>Training</strong> – Complete two phases (by June 2021) and evaluate continuation</td>
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<td>Stand-alone software as a service</td>
<td><strong>Wiki</strong> – new content, updating, enhancing</td>
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<td><strong>Campus Network management as a Service (CNaaS)</strong> – evaluate logging aggregation work (T3); determine FG’s future</td>
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Led by Maria Isabel Gandia Carriedo (CSUC/RedIRIS)

Start new FGs and/or re-activated completed if a clear need arises.
**Task 3: Monitoring and Management**  
Task Leader: Pavle Vuletić (UoB/AMRES)

<table>
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<th>Component</th>
<th>Details</th>
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<td><strong>perfSONAR</strong></td>
<td>- New major version; development and support in the Global team</td>
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<td>- Ongoing engagement, including 2(^{nd}) European perfSONAR User Workshop</td>
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<tr>
<td><strong>perfSONAR Consultancy</strong></td>
<td>- Continue to provide support to the GÉANT community</td>
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| **Performance Measurement Platform (PMP)** | - Continued maintenance and support for the production PMP  
|                           | - Evaluate additional measurement tools, use of AI for analysis         |
| **Network Management as a Service (NMaaS)** | - Continued development and maintenance: new features, new tools   
|                           | - User engagement; securing and onboarding new users                    |
| **WiFiMon**               | - Continued development, maintenance and collaboration with eduroam    |
|                           | - User engagement; securing and onboarding new users                    |
| **Network Telemetry**     | - Complete testbed deployment to support INT network service monitoring |
|                           | - Follow up community interest in sharing large scale network telemetry data |
We need help with

**Licensing and IPR**
- Defining and aligning within the WP, the project and with NRENs

**Recovering underspend from NRENs**
- To support greater agility in extending / starting new work items

**User engagement**
- Confirming ongoing NREN commitment to work items
- Increasing uptake of production services
Thank you
Any questions?

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