



COMMUNICATION PLATFORM
FOR TENDERS OF NOVEL TRANSPORT NETWORKS

The Second Report on Dissemination & Collaboration

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1 Executive Summary

This document describes the COMPLETE collaboration and dissemination actions and achievements during the second part of the project, Months 19 – 36. It presents the collaboration and dissemination results with reference to the KPIs defined in the deliverables D3.1. “Dissemination & Collaboration Plans” and D3.4. “Updated Dissemination & Collaboration Plans”. As detailed in this deliverable, almost all target KPIs were fulfilled. COMPLETE partners managed to achieve most of the dissemination targets by participating in events in the area of optical communications, advanced network services and various meetings, including equipment tests with vendors. During these events and meetings, COMPLETE partners had further opportunity to directly communicate with representatives of potential users of the COMPLETE platform as well as optical vendors. Moreover, COMPLETE partners have further established communication channels with local public network operators in the Czech Republic, Greece and Poland, and used all existing communication channels in order to further disseminate COMPLETE’s scope and results within the GÉANT ecosystem.

2 Introduction and overall strategy

High complexity of public procurement procedures imposes the need for creating an EU-wide entity in order to support public institutions with know-how and clear guidelines on how to efficiently collect all required market information and conduct tenders. In order to efficiently conduct tenders for beyond state-of-the-art optical equipment, the public sector needs to synchronize efforts by building a common procurement roadmap and specifying short term and mid-to-long term requirements.

The objective of the COMPLETE project is to optimize spending of public resources on optical network equipment and related services. As a key approach towards this goal, the project proposes to create a common information platform for public procurers and support them in the procurement process by providing organizational and technical expertise. This platform will significantly improve the quality of decisions taken by public procurers and in some cases will enable them to conduct procurements that previously would not have been possible due to various organizational and technological constraints, such as no access to technical information and roadmaps.

The expected project impact is focused on addressing the challenges faced by the public sector in respect to procurement procedures in a number of European Union countries. Specific opportunities to address concrete public sector challenges and needs will be provided to the vendors and the industry. At the same time, it should be possible to reduce public sector demand fragmentation through definition of common specifications and preparation of joint procurement procedures. The project will directly help public procurers to improve the quality of their procurement outcomes and will also enable entities that were previously unable to undertake decisions, to take part in public procurements.

This document presents the results of the collaboration and dissemination activities in the COMPLETE project in the second half of its period. The collaboration and dissemination activities are in the core of the COMPLETE project and are strongly connected with project results and goals. This document describes the dissemination and collaboration activities undertaken by project partners after Month 18 that were required to achieve targeted results.

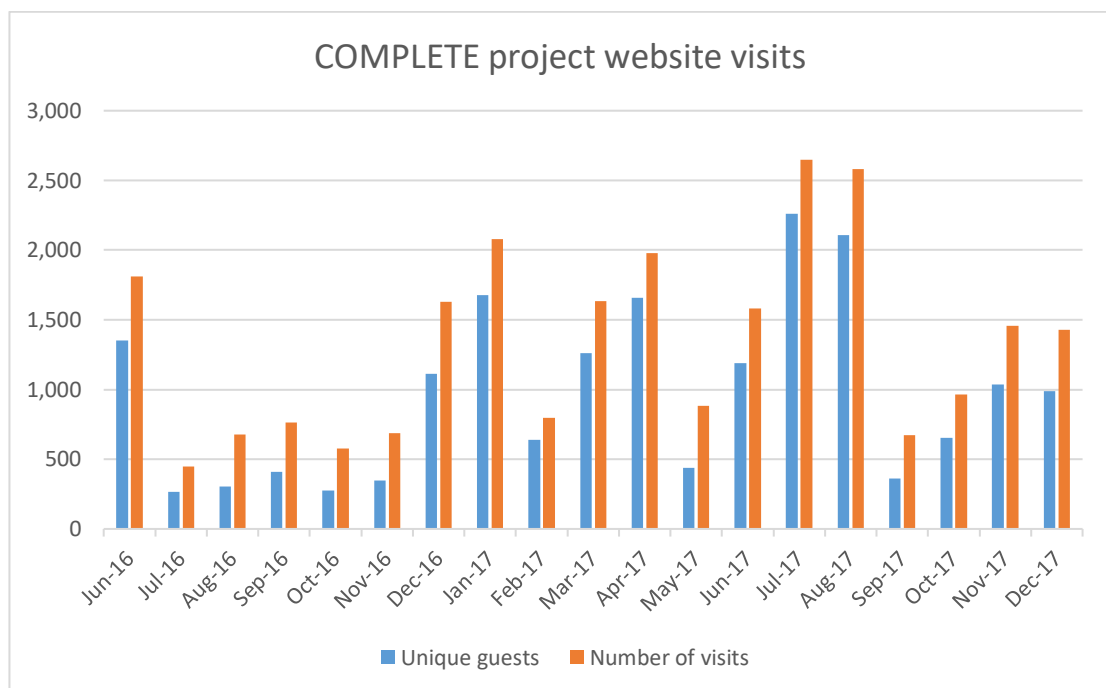
3 Dissemination Activities

Dissemination activities undertaken by COMPLETE project partners were focused on taking part in industry conferences and events with strong participation of the NREN community. Moreover, project partners were updating the specially created project website, issued new newsletters, posters and technical documents provided by system and component vendors.

3.1 External dissemination

3.1.1 Project website

The project website: <http://photonics--complete.eu/> is hosted and administrated by PSNC. All relevant project information, events, presentations, documents, technical materials and articles were submitted and updated on the project website. The figure below presents the statistics for COMPLETE website.



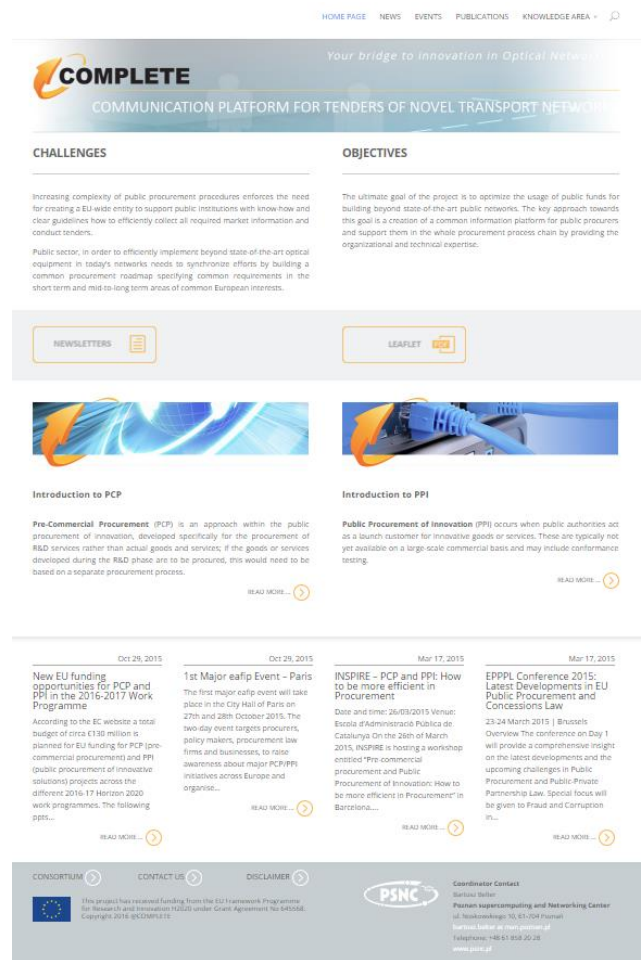


Fig. 1. Project website main page.

The website contains information regarding the project, its goals, documents and references. The presentations and newsletters are attached and updated. The website also contains template materials for the project documents. The project web site has been described in detail in deliverable D1.2. “1st Periodic Report”.

During the second part of the COMPLETE project, its partners were updating the website with further information regarding the events, newsletters and materials from optical equipment vendors.

3.1.2 Events

This section reports the dissemination activities conducted by Project Partners during the specific events planned by the consortium. Moreover, achievements are compared with the KPIs:

Event	Short description	Involved partners	Corresponding KPIs	Achievements
ICTON 2016	https://icton2016.fbk.eu/ The International Conference on Transparent Optical Networks has the scope concentrated mainly on the applications of transparent and all-optical technologies in telecommunications, computing and novel applications.	CESNET	Number of papers: 1 Number of Posters: 1	Number of papers: 1 “Pre-Commercial Procurement in Optical Networking domain” Number of Posters: 1 “Pre-Commercial Procurement in Optical Networking domain”
TNC 2017	https://tnc17.terena.org/ The TNC Networking Conference is the largest and most prestigious European research networking conference, with more than 650 participants attending this annual event. TNC brings together decision makers, managers, networking and collaboration specialists, and identity and access management experts from all major European networking and research organizations, universities, worldwide sister institutions, as well as industry representatives.	PSNC, CESNET, GRNET	Number of speeches: 1 Number of booths: 1 Workshop attendees: min 30 Unique visitors: >200	Number of speeches: 2 1. Introduction to the workshop, scope and expected results (Bartosz Belter, PSNC) 2. The PCP/PPI tutorial (Sara Bedin, independent expert)

	<p>Project partners organized the workshop with attendees from public network operators on the one hand, and vendors on the other hand. The main goal was to share information about the status and long term plans of research networks, and create a unique forum for discussions with the vendors. Min 3 industrial talks and min 5 NRENs future outlooks were expected.</p> <p>More details about this event are provided in section 3.1.2.1</p>			<p>Number of booths: 1</p> <p>Workshop attendees: >30</p> <p>Unique visitors: 720</p> <p>Newsletter No. 5 has been dedicated to the TNC17 session organised by COMPLETE partners.</p>
<p>NGON, 2017</p>	<p>https://nextgenerationoptical.com</p> <p>NGON 2017 addressed and mirrored optical innovation and drive towards Terabit transmission with a smarter and more flexible exhibition and conference. NGON is the most important optical conference in Europe.</p> <ul style="list-style-type: none"> • Optical Data Centre Interconnect • Transport SDN • Photonic Integration • Optical as Enabler for Gigabit Cities & IoT 	<p>CESNET, GRNET</p>	<p>Number of presentations: 1</p> <p>Unique visitors: >50</p>	<p>Number of presentations: 1</p> <p>CESNET presentation: "Open Optical White Line Systems – Similar Hype as SDN?"</p> <p>Unique visitors: 750</p> <p>Number of vendors approached for discussion:</p> <p>9 namely ADVA, Ciena, Coriant, ECI Telecom, Ekinops, Huawei, Lumentum, MRV and Nokia</p>

SDN & OpenFlow World Congress 2016	http://www.layer123.com/sdn <p>Launched in the spring of 2012 - SDN & OpenFlow World Congress is the industry leading debating forum and showcase for the rapidly growing and massively influential, Software-Defined Networking and Network Functions Virtualisation industries. Now, with over 100 supporting partners and sponsors, and 1,000+ delegates, the World Congress has established itself as the principal network innovation conference in Europe for the global telecommunications industry.</p>	GRNET	<p>Number of participants from the project: min 1</p> <p>Number of vendors approached: 5</p>	<p>Number of participants from the project: 1</p> <p>Number of vendors approached: 5, namely ADVA Optical, Cisco Systems, Coriant, ECI and Huawei</p>
SDN & OpenFlow World Congress 2017	http://www.layer123.com/sdn <p>Launched in the spring of 2012 - SDN & OpenFlow World Congress is the industry leading debating forum and showcase for the rapidly growing and massively influential, Software-Defined Networking and Network Functions Virtualisation industries. Now, with over 100 supporting partners and sponsors, and 1,000+ delegates, the World Congress has established itself as the principal network innovation conference in Europe for the global telecommunications industry.</p>	GRNET PSNC	<p>Number of participants from the project: min 1</p> <p>Number of vendors approached: 5</p>	<p>Number of participants from the project: 1 (PSNC)</p> <p>Number of vendors approached: 5</p>
EC concertation events	<p>The European Commission organizes regular concertation meetings for Photonics21 (annual) and PCP projects (annual). Project partners plan to attend these events, presenting the project goals, status and major achievements.</p>	PSNC, GRNET, CESNET	<p>Number of events attended: min 3</p>	<p>Number of events attended: 3</p> <p><u>For PSNC:</u></p> <p>“Annual Concertation Meeting of</p>

				<p>on-going innovation procurement projects”</p> <p>08-09.03.2017</p> <p><u>For CESNET:</u></p> <p>“Workshop for innovation procurement in public construction”</p> <p>14th Nov 2017 City Hall, Prague, Czech Republic</p> <p><u>For GRNET:</u></p> <p>“2nd Major EAFIP Event on Innovation Procurement”</p> <p>18th - 19th Oct, 2017, Athens, Greece</p>
ECOC 2017		PSNC	Number of vendors approached: 3	<p>Number of vendors approached: 2</p> <p>Lumentum, HUAWEI</p>

The following sections provide detailed information and reports regarding the activities undertaken during the events and internal/external activities. Internal PCP/PPI awareness events were organized by each COMPLETE partner.

3.1.2.1 TNC2017

During the TNC2017 conference, project partners organized a special session dedicated to the PCP/PPI activities in the NREN community. The talks during the session were also given by the specialists in the area of PCP/PPI (Sara Bedin), European Commission representatives (Lieve Bos) and experienced PCP/PPI user (Philippe Segers). The session was titled:

TNC17: Pre-commercial procurement: challenges and opportunities for the NREN community

Session chairs:

Bartosz Belter bartosz.belter@man.poznan.pl

Chrysostomos Tziouvaras tziou@admin.grnet.gr

Rudolf Vohnout rudolf.vohnout@cesnet.cz

It was discussed that Public Procurement is an important and sophisticated mechanism for public bodies, which influences the overall market and creates policies for governments, agencies and other public bodies. There is much discussion surrounding the concepts of public procurement and innovation and how these can lead to an economically-stronger, environmentally-resilient and more competitive Europe. It was explained that with respect to research, development and innovation services for public bodies two procurement mechanisms were created and are becoming more and more popular: PCP and PPI.

- **Public procurement of innovation (PPI)** occurs when public authorities act as a launch customer for innovative goods or services. These are typically not yet available on a large-scale commercial basis and may include conformance testing.
- **Pre-commercial procurement (PCP)** is an approach within the public procurement of innovation, developed specifically for the procurement of R&D services rather than actual goods and services; if the goods or services developed during the R&D phase are to be procured, this would need to be based on a separate procurement process. Commercial procurement is described in the European Commission's communication with the title Pre-Commercial Procurement: Driving innovation to ensure sustainable high quality public services in Europe (Brussels, 14.12.2007 COM 2007:799 final).

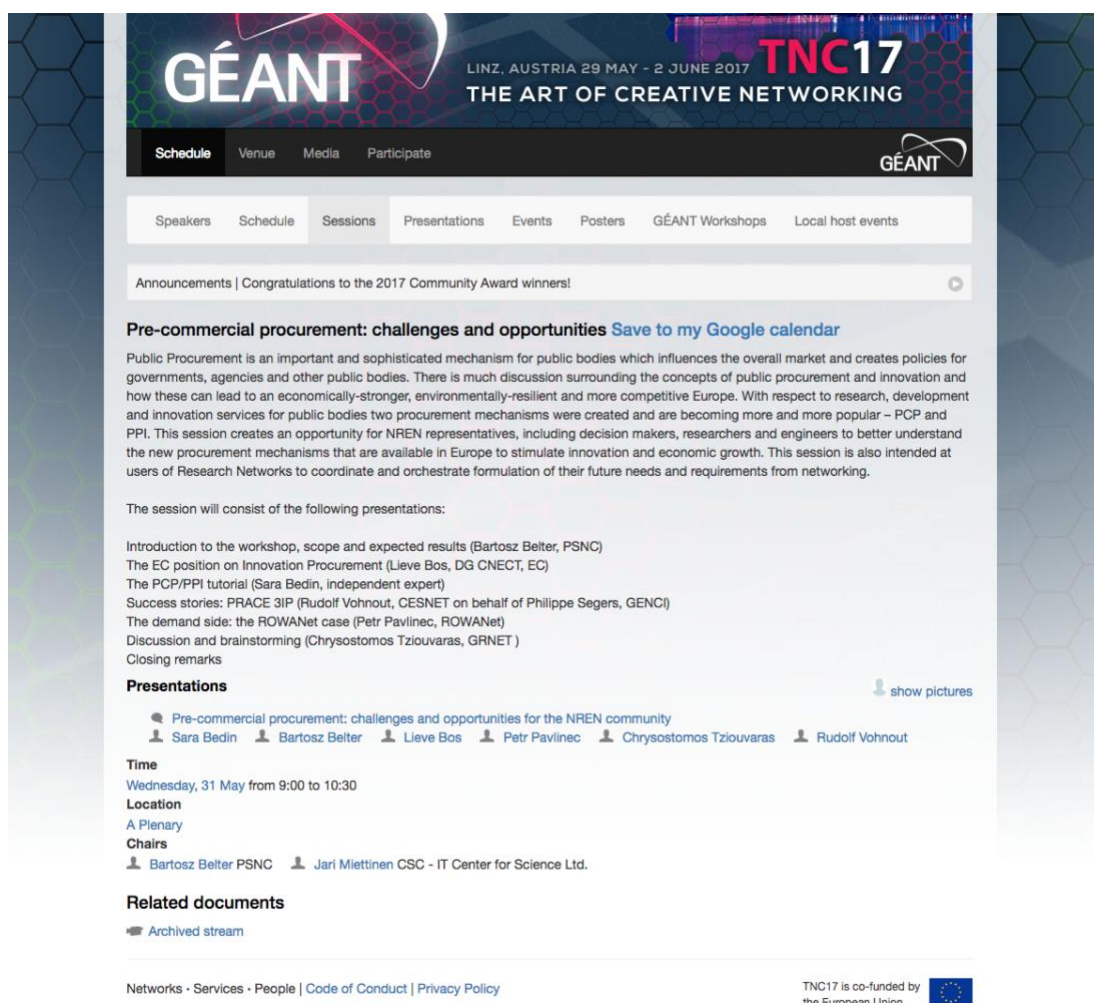
Session chairs explained that using PPI and PCP mechanisms public buyers can influence the market towards innovative solutions desired by specific bodies.

Based on the examples, speakers highlighted that in order to efficiently implement beyond state-of-the-art network services in today's networks, Research Networks need to synchronize efforts by building a common procurement roadmap specifying common requirements in the short term and mid-to-long term areas of common European interests.

This session created an opportunity for NREN representatives, including decision makers, researchers and engineers to better understand the new procurement mechanisms that are available in Europe to stimulate innovation and economic growth. This session was also intended for users of Research Networks to coordinate and orchestrate formulation of their future needs and requirements from networking.

The session delivered the following presentations:

- Introduction to the workshop, scope and expected results (Bartosz Belter, PSNC)
- The EC position on Innovation Procurement (Lieve Bos, DG CNECT, EC)
- The PCP/PPI tutorial (Sara Bedin, independent expert)
- Success stories: PRACE 3IP (Philippe Segers, GENCI)
- The demand side: the ROWANet case (Petr Pavlinec, ROWANet)
- Discussion and brainstorming (Chrysostomos Tziouvaras, GRNET)
- Closing remarks.



GÉANT LINZ, AUSTRIA 29 MAY - 2 JUNE 2017 **TNC17**
THE ART OF CREATIVE NETWORKING

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Pre-commercial procurement: challenges and opportunities [Save to my Google calendar](#)

Public Procurement is an important and sophisticated mechanism for public bodies which influences the overall market and creates policies for governments, agencies and other public bodies. There is much discussion surrounding the concepts of public procurement and innovation and how these can lead to an economically-stronger, environmentally-resilient and more competitive Europe. With respect to research, development and innovation services for public bodies two procurement mechanisms were created and are becoming more and more popular – PCP and PPI. This session creates an opportunity for NREN representatives, including decision makers, researchers and engineers to better understand the new procurement mechanisms that are available in Europe to stimulate innovation and economic growth. This session is also intended at users of Research Networks to coordinate and orchestrate formulation of their future needs and requirements from networking.

The session will consist of the following presentations:

Introduction to the workshop, scope and expected results (Bartosz Belter, PSNC)
The EC position on Innovation Procurement (Lieve Bos, DG CNECT, EC)
The PCP/PPI tutorial (Sara Bedin, independent expert)
Success stories: PRACE 3IP (Rudolf Vohnout, CESNET on behalf of Philippe Segers, GENCI)
The demand side: the ROWANet case (Petr Pavlinec, ROWANet)
Discussion and brainstorming (Chrysostomos Tziouvaras, GRNET)
Closing remarks

Presentations [show pictures](#)

Pre-commercial procurement: challenges and opportunities for the NREN community
Sara Bedin Bartosz Belter Lieve Bos Petr Pavlinec Chrysostomos Tziouvaras Rudolf Vohnout

Time
Wednesday, 31 May from 9:00 to 10:30

Location
A Plenary

Chairs
Bartosz Belter PSNC Jari Miettinen CSC - IT Center for Science Ltd.

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TNC17 is co-funded by the European Union 

Fig. 2. Information about the COMPLETE project session on the TNC2017 conference website.



Fig. 3. Session chair during the COMPLETE project session on the TNC2017 conference.

Moreover, during the TNC2017 conference PSNC organized a joint technical presentation about upcoming technologies in the optical networking area together with GÉANT, ADVA Optical Networking and Juniper Networks.

The goal of the presentation was to show the benefits of the disaggregated Multi-Vendor SDN approach in optical networking. The demonstration included large onsite testbed and concluded with the following leaflet prepared by ADVA Optical Networking.



Multi-layer network coordination is a powerful tool for network operators. It reduces time-to-market, automates network operations and removes operational difficulties. It also increases overall network availability. In the case of packet-optical layer integration, it provides network topology awareness in the packet layer and means that fewer configuration steps are needed during service set up. Such packet-optical layer coordination is enabled by a software-defined network architecture and associated SDN controllers.

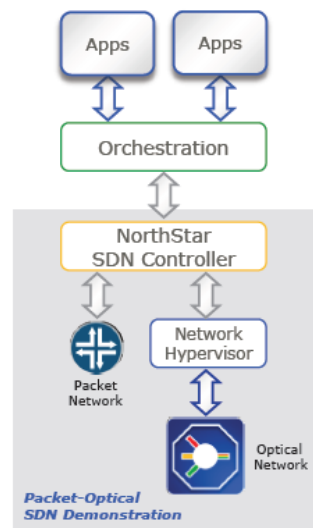
Juniper Networks and ADVA Optical Networking have been collaborating on joint packet-optical solutions for years and have achieved numerous customer wins. These solutions are the foundation of an SDN architecture that both companies are jointly releasing onto the market right now.

Packet-Optical SDN Architecture

Juniper Networks' NorthStar SDN Controller is a powerful and flexible traffic-engineering solution that enables granular visibility and control of IP/MPLS flows in large service-provider and enterprise networks. It receives and displays optical network topology information, which is used as additional traffic-engineering input.

At the transport layer, ADVA's FSP Network Hypervisor provides an SDN-enabling programmable northbound interface. Via this interface the ADVA FSP Network Hypervisor delivers a logical representation of the transport network. Multiple standardized northbound interfaces are available including REST.

Since this architecture conducts network configuration based on packet and optical-layer information, it provides all the benefits of multi-layer coordination. From an application and service perspective, the NorthStar SDN controller integrates into a service-orchestration platform through northbound interfaces.



Features & Benefits

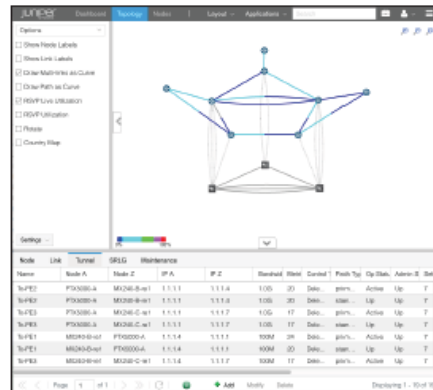
- Powerful tool for network operators
- Reduces time-to-market
- Automates network operations
- Removes operational difficulties
- Increases overall network availability
- Multi-layer network topology awareness

The joint Packet-Optical SDN demonstration can be seen at the PSNC booth.



Use Cases

Juniper Networks and ADVA Optical Networking is showcasing its Packet-Optical SDN Architecture at the OFC 2016. The demonstration focuses on three use cases.



Use Case 1: Multi-Layer Visualization

- NorthStar connects to Network Hypervisor
- Network Hypervisor pushes abstract optical topology, including Shared Risk Link Group information, to NorthStar
- NorthStar displays topology of both IP and transport layers

Use Case 2: Diverse Shared Risk Link Group Label Switched Path Pair

- NorthStar provisions two SRLG diverse LSPs with abstract optical topology information from Network Hypervisor

Use Case 3: Fiber Cut

- Simulate fiber cut in optical network (and failure of associated IP links)
- Optical Network GUI visually shows failure
- Network Hypervisor pushes abstract topology update to NorthStar
- NorthStar visually shows failed optical link
- NorthStar visually shows new LSP path

ADVA Optical Networking

At ADVA Optical Networking we're creating new opportunities for tomorrow's networks, a new vision for a connected world. Our intelligent telecommunications hardware, software and services have been deployed by several hundred service providers and thousands of enterprises, helping them drive their networks forward. For more information, please visit us at: www.advaoptical.com.



Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at www.juniper.net.



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Fig.4. ADVA Optical Networking leaflet from TNC 2017 joint presentation.

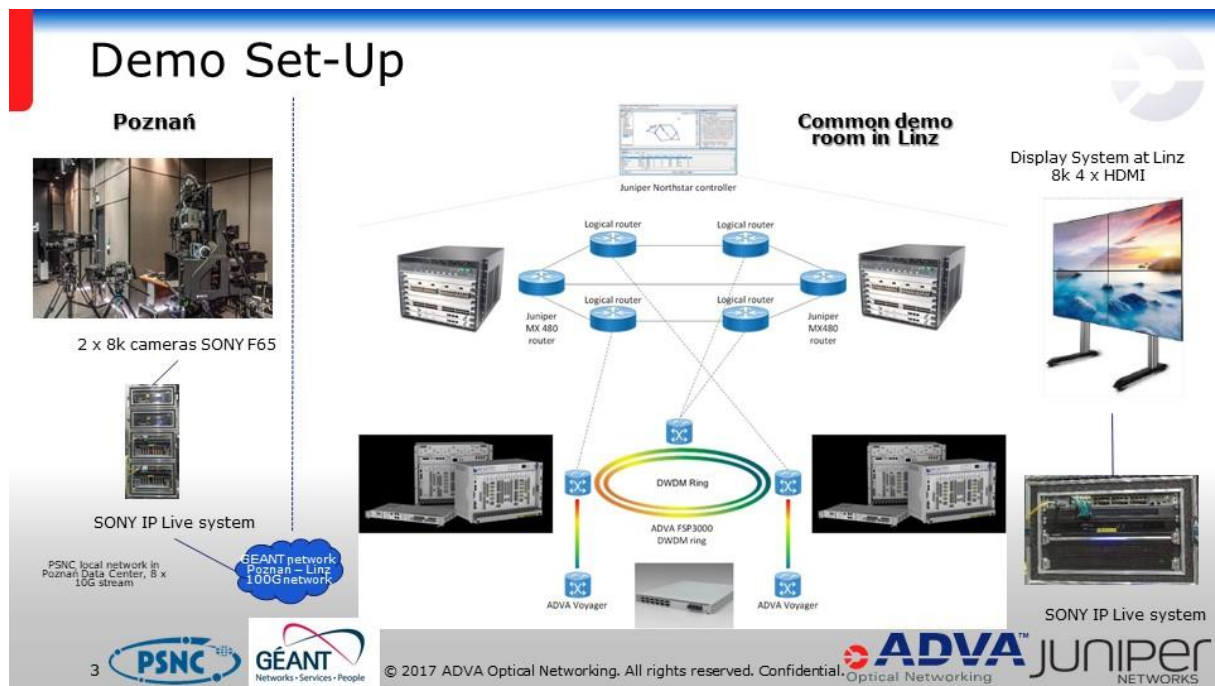


Fig.5. Technical Demonstration setup at TNC 2017 conference joint presentation.

3.1.2.2 9th CEF Workshop

12th - 13th Sep, 2017

Prague, Czech Republic

Partner: CESNET

On September 12th and 13th, after a three-year break, CESNET organized another edition of its popular Customer Empowered Fibre Workshop, which among others aimed at “Support of new applications and disciplines requiring photonic or dark fibre connectivity”. The COMPLETE project was represented by Rudolf Vohnout, who had a presentation on Wednesday morning with a topic of “The right way to procure optical transmission technology”. Its aim was not only to disseminate PCP/PPI advantages and widen its use among NREN community, but also heavily advise audience to talk and approach directly their end-users.

At the end of the COMPLETE presentation, a discussion related to the topic began. The theme the discussion was going around was the right way to approach users. As a result, it can be stated there are two groups of NRENS: one which directly approaches their user base (e.g. in person meetings, education workshops, on premise trainings, etc.), and the other one which basically does not have enough resources to do that. Usually members of the first one are those whose customers (universities, research institutions, etc.) pay for their services and therefore also do not hesitate to give valuable feedback (especially when not satisfied): themselves (rare) or on request. On the other hand, the second part, which is in most cases paid directly by the government for services provision (i.e. where customers tend to have those network services for “free”) are most often evaluated periodically by their sponsors (ministries), but there is no direct feedback interaction “service provider<->users”. It is obvious that in the second case the space of innovation is limited.

As pointed out by one of the previous speakers, new trends coming from community (e.g. open line systems, get rid of vendor lock-in, full disaggregation) are trends that came to attention by the call of the community. Without this voice, vendors would be barely tending to do innovation this way.

Full agenda of the workshop is available on the following website:

<https://www.cesnet.cz/cesnet/events/cef2017/?lang=en>



Fig. 6. COMPLETE project presentation during the CEF workshop.

3.1.2.3 European Assistance for Innovation Procurement (EAFIP)

CESNET participated in the following event under EAFIP meetings:

Workshop for innovation procurement in public construction

Rudolf Vohnout, Radek Velc

14th Nov 2017

City Hall, Prague, Czech Republic

The most active organization in public procurement procedures-related actions domain conducted a workshop in Prague on 14th November.

The presentations are available at:

<http://eafip.eu/events/workshops/construction-workshop/>

The event itself could be (from the attendees' perspective) divided into two parts:

- General information about public procurement.

This covers presentations about PCP and PPI from the general (and already well-known) perspective. The most valuable element was going through the funding opportunities of the upcoming period (2018–2020) of Horizon 2020 in the PCP/PPI domain.

It is also worth mentioning that for several times it was emphasized (and asked by the audience) that PCP actions are excluded from the EC Public Procurement regulations. On the other hand, PPI actions have to be conducted under the regulations.

Also, the Most Economically Advantageous Tender (MEAT) criteria should be applied to Public Procurement evaluation. The value engineering approach should be considered as well.

- Concrete Use Cases and Best Practices, mainly from the PCP domain.

Several use cases were presented. One of the most interesting and inspiring was the QUACO use case. This was a CERN PCP action to R&D new type of magnet to be used in the upgraded version of the accelerator. However, interestingly, CERN and the Large Hadron Collider with its upgrades is a very special use case. Individual regulations just for this case had to be approved to enable realization of such specific procurement procedures.

The other use cases followed the general procurement pattern but emphasized several points not to be underestimated. This includes:

- As a part of Open Market Consultation, do not forget to create collaboration.
- On PCP you cannot negotiate on the technical level (only prior - part of Market Consultation).
- Before moving to the next PCP Phase, the best practice says to organise a PCP conference to address all (potential) supplier questions (related to the tender).
- PCP or, in other words, R&D Procurement is always a shared risk deal (Procurer and Contractor).
- Criteria of Phase 2 should include a regulation of (maximum) price deviation from Phase 1. An example was up to 20% of the price (estimated for the solution) of Phase 1.
- All potential suppliers should provide a schedule. If not, they could be potentially considered as untrustworthy, simply because they do not know the timeframe and sequence of the steps to be done.
- Evaluation should be done in at least 4 steps where the final is always the price. The sequence number of the final evaluation criteria should not be changed.
- The draft version of the tender documents to be sent to the contractors in advance to get their feedback (especially regarding some general errors).
- Bi-monthly meetings with contractors led by a (procurer's) supervisor to follow-up development progress.

A very disputable stimulation topic was if a PCP could be done considering regulations (laws and acts) and standards (technological), because such things created boundaries for innovation which is undesirable.

The workshop provided an opportunity to get in touch with other participants (public procurers, yet contractors as well) and share valuable discussions within the specific issues.

To share the knowledge with PCP/PPI across various fields of industry/public procurers was the issue workshop was focused on, and it clearly hit the target.

The event itself was a great place for networking, even though the number of participants was not that high.



Fig. 7. EAFIP workshop in Prague.

3.1.2.4 2nd Major EAFIP Event on Innovation Procurement.

18th - 19th Oct, 2017, Athens, Greece

Partner: GRNET

GRNET attended the 2nd major EAFIP event on Innovation Procurement that took place in Athens on 18th-19th October 2016. The event was attended by the GRNET Head of Legal Department (Zoi Panagiotara) and Chrysostomos Tziouvaras.

The conference provided solid background information for understanding the PCP and PPI tools and an opportunity to network with institutions that went through a PCP and an opportunity to network with other projects' officials, including PRACE-3IP, that went through a PCP process. The conference also provided an opportunity for networking with EU officials about the H2020 funding opportunities for PCP/PPI at the 2017 programme. Finally, it provided a great opportunity for the GRNET Head of Legal Department to discuss with lawyers from Institutions that went through a PCP regarding the new legal procedures.

Further information can be found at:

<http://eafip.eu/events/athens-2016/>

3.1.2.5 Internal PCP/PPI Awareness Event at CESNET

24th Oct, 2017, Prague, Czech Republic

During CESNET internal seminar/workshop, a presentation with information about PCP/PPI has been shared by Radek Velc. He went through the essential steps and benefits of the approach as well as preliminary results project has archived so far. PCP/PPI mechanisms were described as essential for fostering the innovative potential of R&D community. When targeting at the products and services not currently available at the telco market, such approach considerably increases efficiency of many various fields of a NREN performance including reducing costs.

At the end of the seminar there was an interesting discussion, mainly about the financial scheme of the R&D contracts.



Fig. 8. CESNET internal PCP/PPI awareness event.

3.1.2.6 Internal PCP/PPI Awareness Event at GRNET

6th Nov, 2017, Athens, Greece

An internal workshop regarding PCP/PPI was held in GRNET on 6th November 2017, and it was attended by key GRNET personnel, namely the two Lawyers and the Chief Operations Officer. Chrysostomos Tziouvaras introduced the concepts of Innovation Procurement and the work that COMPLETE is performing on this area. Then, Zoi Panagiotara, head of the Legal Department, elaborated on the legal differences of Innovation Procurement compared to traditional procurement tools. Based on this, a discussion initiated about potential changes on the company's procedures and personnel skillset for supporting the new procurement tools.

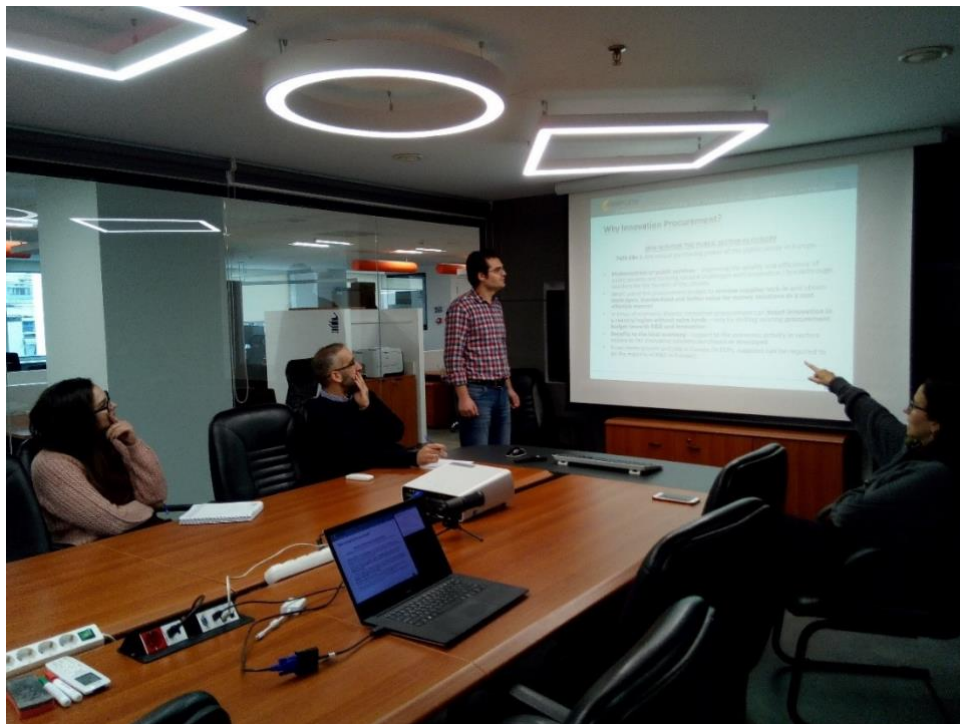


Fig. 9. GRNET internal PCP/PPI awareness event.

3.1.2.7 PSNC Internal PCP/PPI awareness event

PSNC Seminars

16th Apr, 2018, Poznań, Poland

PSNC has scheduled and will organize a seminar dedicated to PCP/PPI in research and building scientific infrastructures. The PSNC seminars are open to every interested participant.

3.1.3 Newsletters and Leaflets

During the second half of the project the COMPLETE partners released further newsletters: No 4, No 5, No 6, No 7 and No 8. Newsletter were published on the project website. Figures 10 – 14 present front pages of new newsletters. Newsletters were dedicated to the PCP/PPI mechanisms, new technologies in optical networking domain, user requirements and success stories and collaboration with other projects.

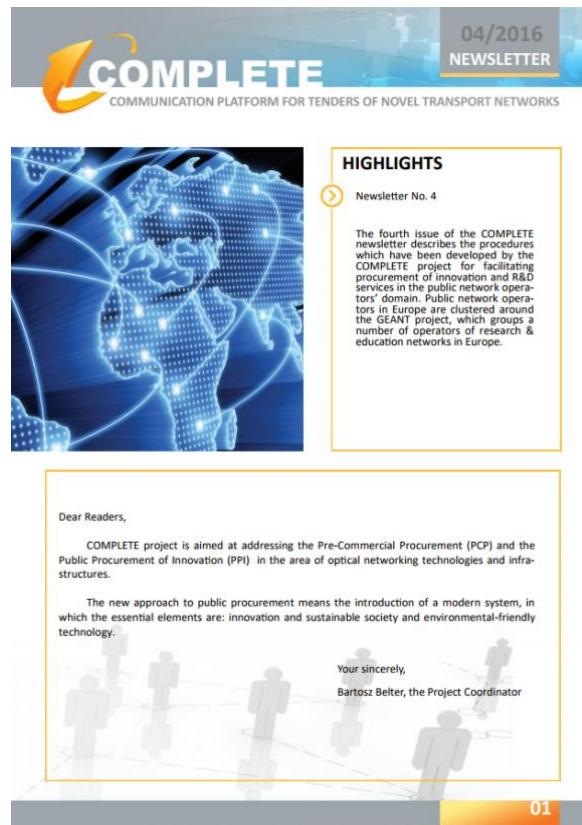


Fig. 10. Newsletter No. 4 front page.

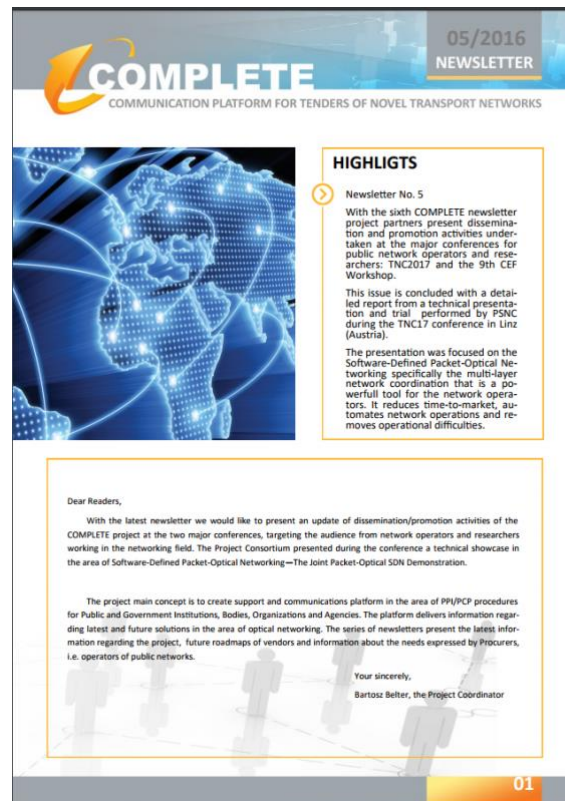


Fig. 11. Newsletter No. 5 front page.

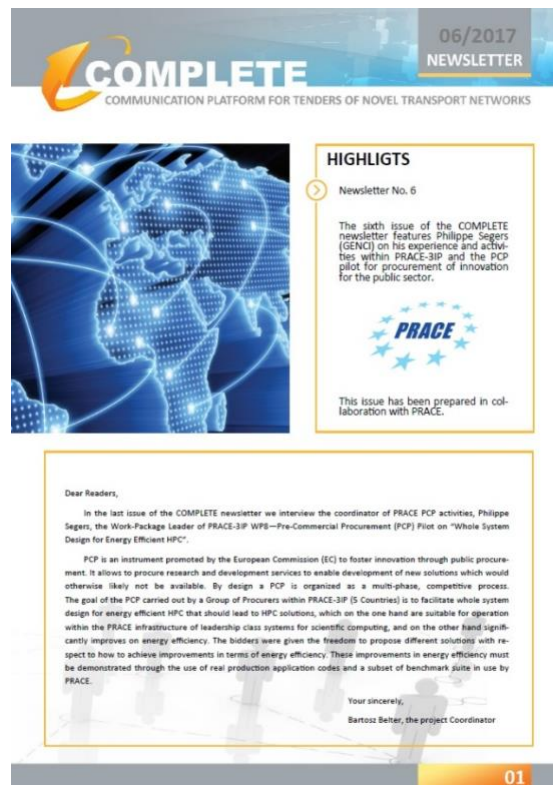


Fig. 12. Newsletter No. 6 front page.



Fig. 13. Newsletter No. 7 front page.

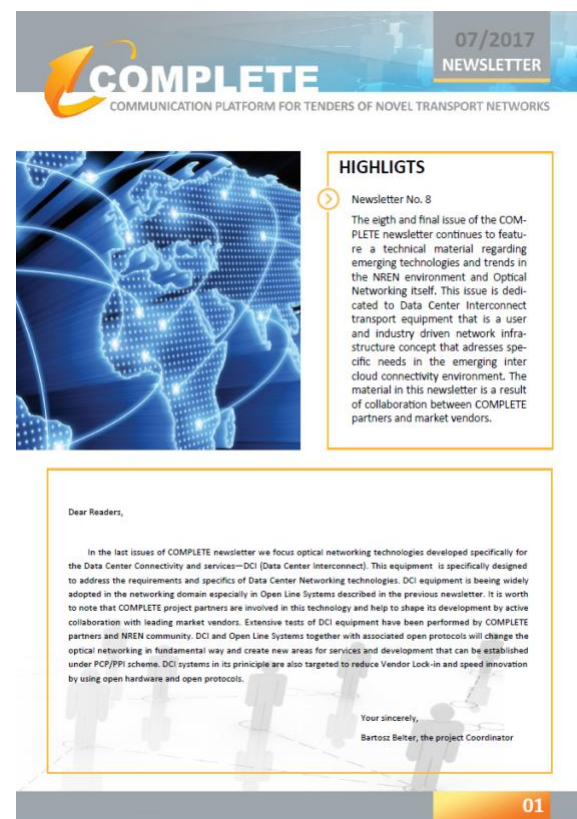


Fig. 14. Newsletter No. 8 front page.

3.1.4 Posters

As an additional means of dissemination, COMPLETE partners prepared posters that were presented during the selected events or conferences.

The COMPLETE Project has presented a poster during the ICTON 2016 conference that took place on July 10th – 14th 2016 in Trento. The title of the poster was “Pre-Commercial Procurement in Optical Networking Domain”. The goal of the poster was to briefly present the COMPLETE project itself, achievements so far and examples of new technologies in optical networking domain that could be developed under PCP/PPI scheme. Fig. 15 presents the ICTON 2016 COMPLETE project poster.

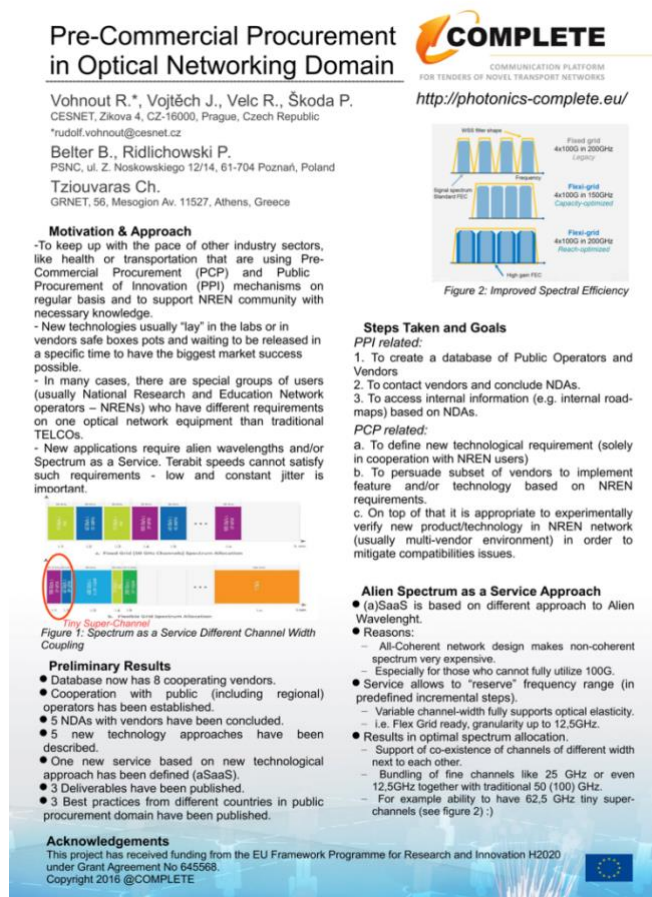
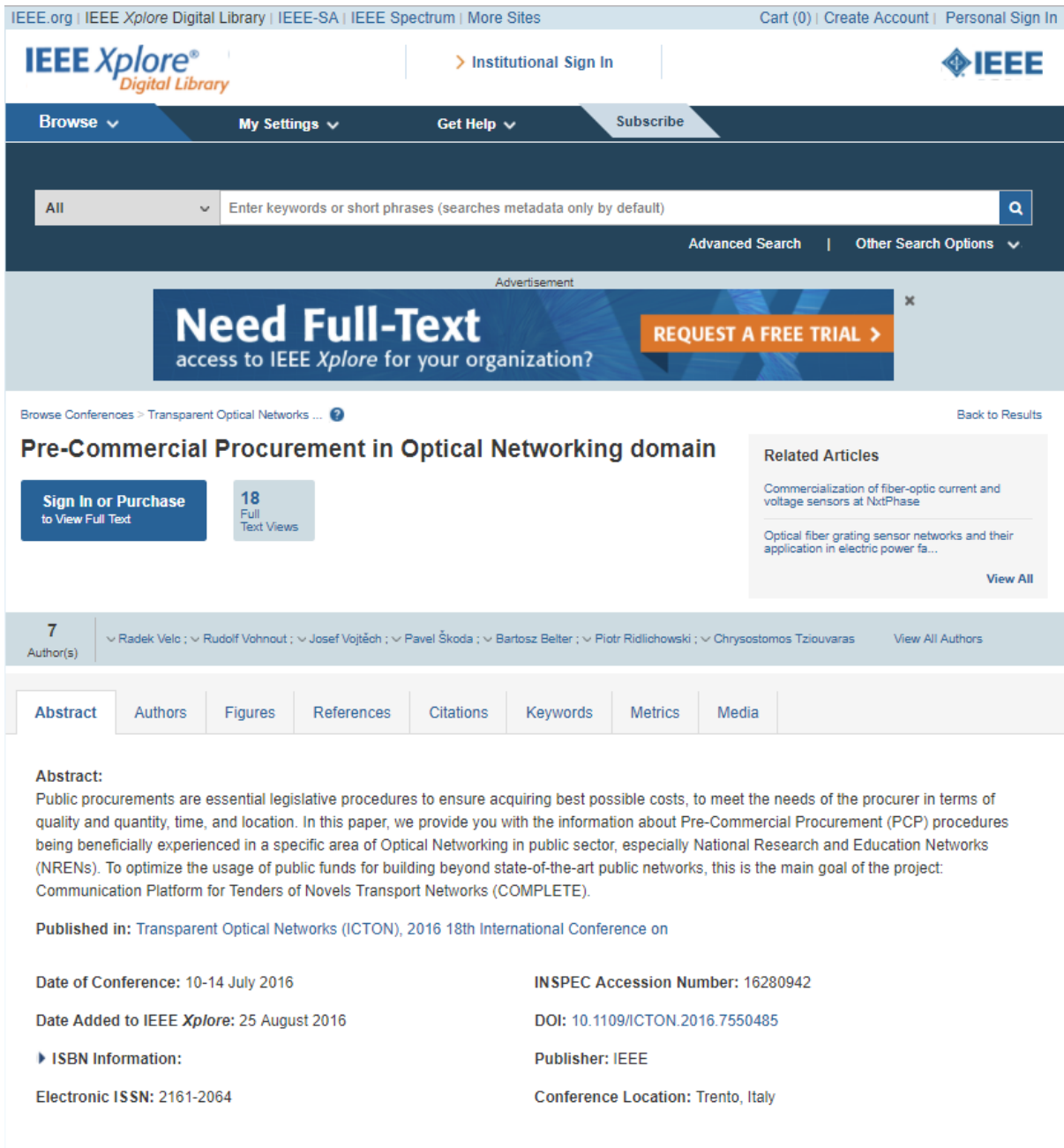


Fig. 15. ICTON 2016 COMPLETE project poster.

3.1.5 Papers

COMPLETE partners presented also a paper focused on PCP in Optical Networking domain during the ICTON 2016 conference. The Fig. 16 presents the article entry view on IEEE Xplore database with publication information.



The screenshot shows the IEEE Xplore Digital Library interface. At the top, there are navigation links for IEEE.org, IEEE Xplore Digital Library, IEEE-SA, IEEE Spectrum, and More Sites. On the right, there are links for Cart (0), Create Account, and Personal Sign In. The main header includes the IEEE Xplore Digital Library logo, an Institutional Sign In button, and the IEEE logo. Below the header, there are tabs for Browse, My Settings, Get Help, and Subscribe. A search bar is present with a dropdown menu set to 'All' and a search button. Below the search bar, there is an advertisement for 'Need Full-Text' access to IEEE Xplore for organizations, with a 'REQUEST A FREE TRIAL' button. The main content area displays the article title 'Pre-Commercial Procurement in Optical Networking domain' under the breadcrumb 'Browse Conferences > Transparent Optical Networks ...'. To the left of the title is a 'Sign In or Purchase to View Full Text' button, and to the right is a box indicating '18 Full Text Views'. Below the title, there is a list of authors: 7 Author(s) including Radek Vele, Rudolf Vohnout, Josef Vojtěch, Pavel Škoda, Bartosz Belter, Piotr Ridlichowski, and Chrysostomos Tziouvaras. A 'View All Authors' link is provided. Below the authors, there are tabs for Abstract, Authors, Figures, References, Citations, Keywords, Metrics, and Media. The 'Abstract' tab is selected, showing the abstract text: 'Public procurements are essential legislative procedures to ensure acquiring best possible costs, to meet the needs of the procurer in terms of quality and quantity, time, and location. In this paper, we provide you with the information about Pre-Commercial Procurement (PCP) procedures being beneficially experienced in a specific area of Optical Networking in public sector, especially National Research and Education Networks (NRENs). To optimize the usage of public funds for building beyond state-of-the-art public networks, this is the main goal of the project: Communication Platform for Tenders of Novels Transport Networks (COMPLETE).'. Below the abstract, it states 'Published in: Transparent Optical Networks (ICTON), 2016 18th International Conference on'. At the bottom, there is a table with publication information: Date of Conference: 10-14 July 2016, INSPEC Accession Number: 16280942, Date Added to IEEE Xplore: 25 August 2016, DOI: 10.1109/ICTON.2016.7550485, ISBN Information: Publisher: IEEE, Electronic ISSN: 2161-2064, and Conference Location: Trento, Italy.

Fig. 16. ICTON 2016 article.

3.1.6 Social Media

Project Partners also included social media services to disseminate the Project Results and activities. Fig. 17 presents an example of activity on LinkedIn portal.

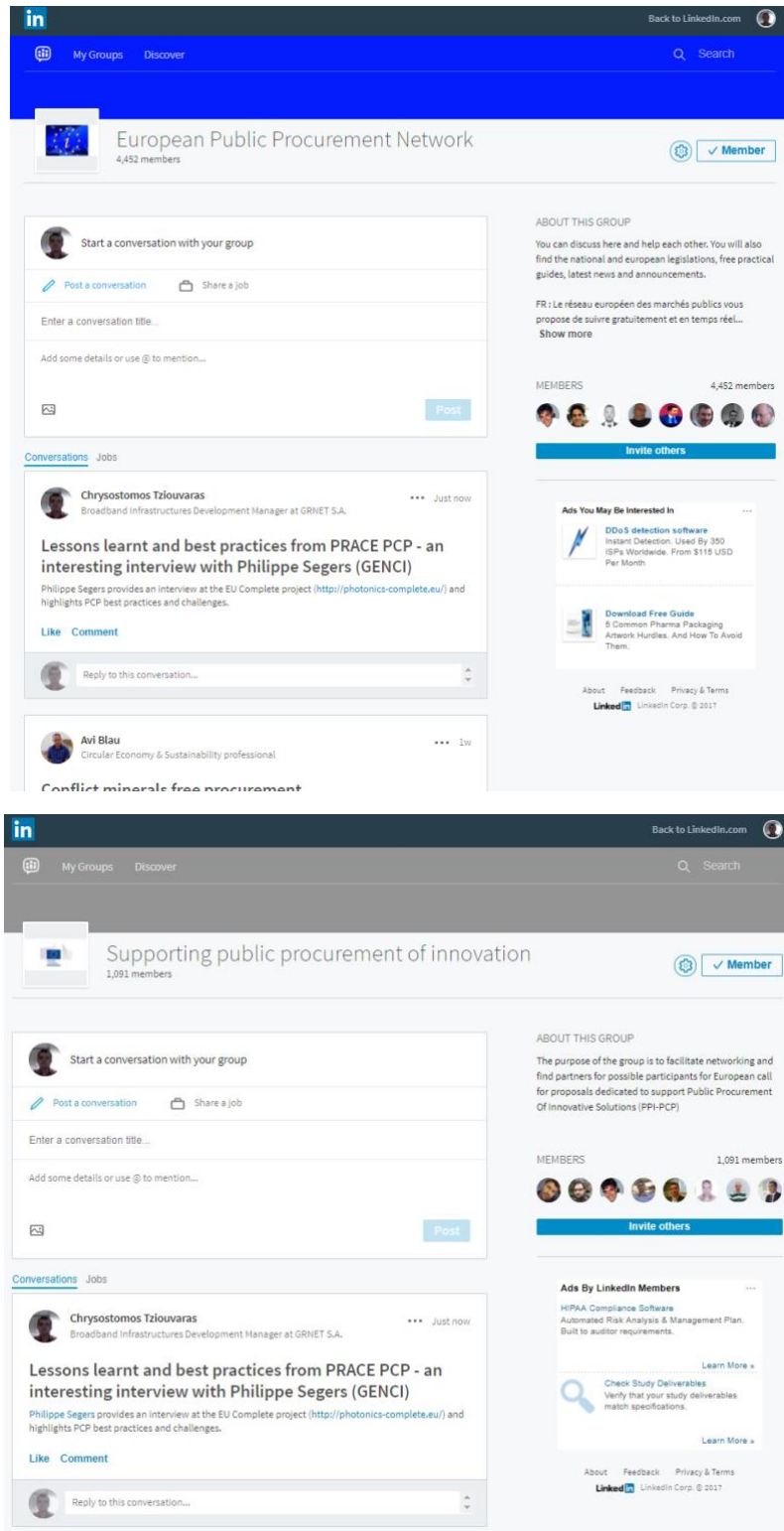


Fig. 17. Example of social media activity

4 Collaboration Activities

4.1 Collaboration with other projects

4.1.1 Collaboration with PRACE

COMPLETE initiated collaboration with PRACE to establish a communication channel for information exchange about the results of on-going PCP activities in Europe. Through the Third PRACE Implementation Phase Project (PRACE-3IP), PRACE has undertaken a joint Pre-Commercial Procurement (PCP) procedure addressing the major issue of the energy efficiency of large scale supercomputers. The whole procedure was initiated in 2013, with the final contract awards in November 2016.

The COMPLETE consortium invited the PRACE representative responsible for the PCP to give a talk on lessons learned and results of the PCP action during the session organized by COMPLETE at the Terena Networking Conference 2017 (TNC17) in Linz, Austria. The contact point for the project was Philippe Segers from GENCI. The talk given at the conference was titled “Success stories: PRACE-3IP”. Philippe Segers prepared the presentation, but due to other obligations and last minute changes in Philippe’s calendar the talk was given by Rudolf Vohnout (CESNET) on his behalf.

Following successful collaboration at TNC17, the COMPLETE consortium released a questionnaire to PRACE with several questions, asking mainly for lessons learned and advices for newcomers and potential implementers of the PCP procedures. The summary of this collaboration has been concluded in the 6th issue of the project newsletter (Fig. 12).

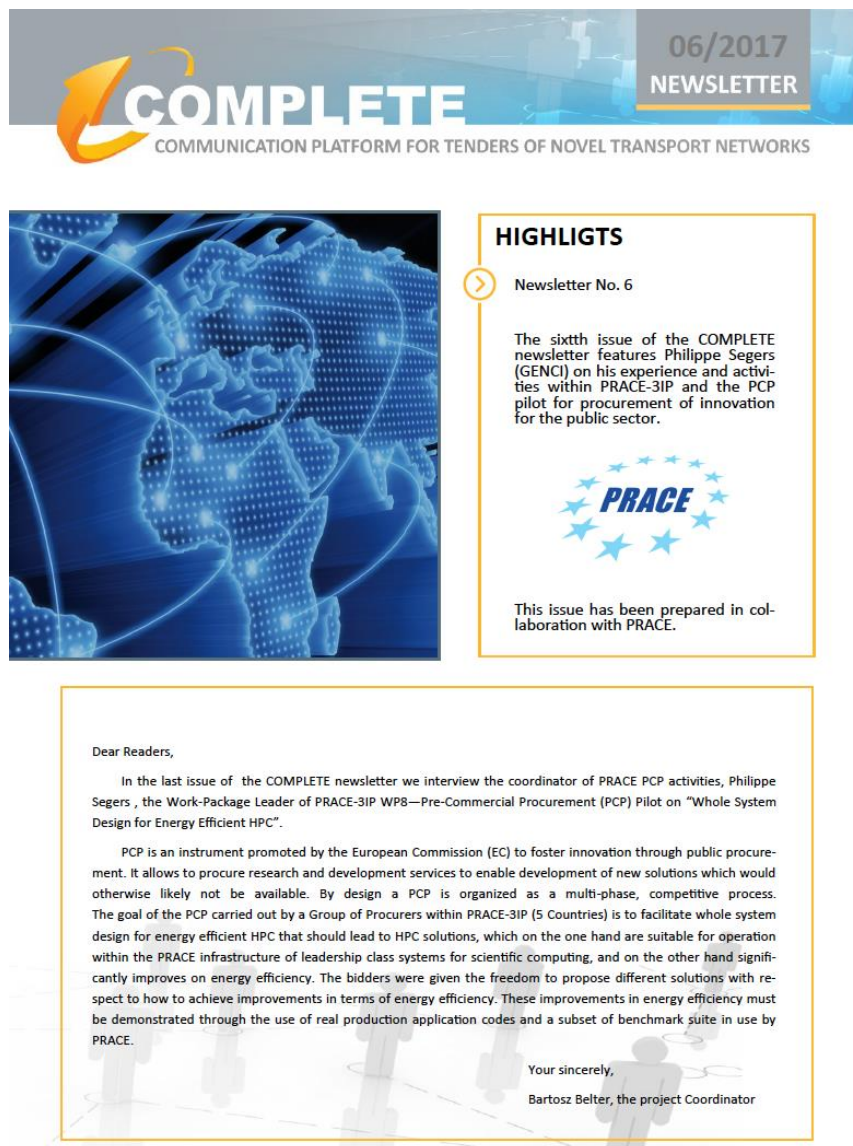


Fig. 18. Complete newsletter No. 6 front page.

In summary, the following can summarize lessons learned from the PRACE PCP actions:

“The PRACE Association is in the process of a PCP for an energy efficient and sustainable HPC. Up to now, PRACE has successfully finished the phases “Solution Design” and “Prototype Development” and currently working with two vendors for the final PCP phase “Pre-commercial small scale production/service deployment and field test”. The most interesting lessons learnt during this PCP, could be summarized as follows:

- *Detailed customer requirements were communicated to the vendors early in the product development process. Moreover, regular updates of the requirements were performed.*

- *Follow a realistic approach: PRACE does not target at producing disruptive innovation but at leveraging incremental innovation based on existing solutions, in a way that is the most valuable for PRACE.*
- *Vendors are not willing to negotiate about Intellectual Property Rights (IPR). The approach followed by PRACE was that IPRs are kept by vendors but the PRACE group of procurers gains discount on future IPR usage.*
- *Offers' evaluation criteria should be clear and measurable. At the PRCA PCP case, they focused on specific technological aspects and real-world benchmark suites (UEABS)."*

4.1.2 Collaboration with GÉANT and NRENS

Since the COMPLETE consortium members are from the GÉANT community, collaboration with GÉANT has been selected as a priority task in the project work plan. The collaboration with GÉANT can be evaluated from different perspectives:

- Dissemination of information about PCP/PPI instruments.
- Dissemination of information about future opportunities arising from the EC calls for proposals in the area of PCP.
- Support of initiatives undertaken by the GÉANT community towards PCP.
- Support of discussions about the future of GÉANT.

The first topic has been covered by several project activities. First of all, the members of the COMPLETE consortium attended the regular GÉANT project meetings, including GÉANT Workshops, Symposiums and the General Assembly meetings. The regular GÉANT project meetings (e.g. workshops) are attended by engineers and task leaders, involved in day-to-day operations of the GÉANT project. Therefore, the dissemination actions targeted at this audience. Usually, if the topic fits into the workshop theme, project partners were targeting operational aspects of the PCP projects. Some topics discussed during GÉANT workshops overlap with the topics covered by COMPLETE (e.g. the analysis of vendors' roadmaps, validating upcoming technology, etc.). These activities have been carried out jointly, creating synergies between both projects. Examples of such collaboration were described in the project deliverables. On the other hand, the GÉANT General Assembly meetings are attended by the GÉANT and NREN decision makers, therefore all presentations and discussions are properly targeted to this group. The goal of dissemination activities was to raise the awareness of the PCP mechanisms in the GÉANT community and, according to the COMPLETE consortium, this goal has been successfully reached (e.g. a joint proposal of GÉANT and CERN on Pre-commercial procurement of cloud services, as explained in the following paragraphs). The measure of success of these activities can be demonstrated as a number of declarations from the NREN community to continue collaboration on PCP after the end of the COMPLETE project, with the ultimate goal of establishing the critical mass of procurers for future PCP initiatives in the field of networking. The Letters of Support received from several NRENS have been included in deliverable D2.3. Another measure of the successful execution of this task is the organization of the PCP Workshop during the TNC17 conference, which was held in the main track of the conference.

The second topic, i.e. raising awareness of opportunities for the community thanks to the PCP calls announced by the EC, has been reached by attending regular, so called "GÉANT EU liaison infoshare" videoconferences and presenting opportunities for GÉANT from participation in the PCP-

related calls. The measure of potential success of these activities can be demonstrated as a joint CERN-GÉANT initiative for PCP on cloud services.

The third topic, i.e. support to initiatives undertaken by the GÉANT community, has been realized as a set of dissemination and support activities to some NRENs and GÉANT, targeting the realization of the PCP project by the GÉANT/NREN community. COMPLETE strongly supported all activities undertaken by the GÉANT/NRENs community and provided useful contribution to the project formulated jointly by the GÉANT/NRENs to realize the PCP on procuring novel cloud services for the NREN community. Due to confidentiality of information and the fact that the PCP proposal is in progress (due to April 2018) this Deliverable will not provide further information or details of the planned action.

The last topic, i.e. support to discussions about future directions of GÉANT, has been realized twofold. Firstly, the project partners established collaboration with GÉANT Executives targeting establishment of a Special Interest Group (SIG), investigating potential adoption of PCP procedures in GÉANT. The request for SIG was distributed by the GRNET representative in General Assembly of GÉANT. The response received from the GÉANT Exec was very positive and the recommendation given was to pursue the adoption of PCP activities within the GÉANT Project itself. Secondly, PSNC submitted a PSNC White Paper, where the main goals and directions of GÉANT have been described. The following figure presents the cover page of the PSNC contribution.

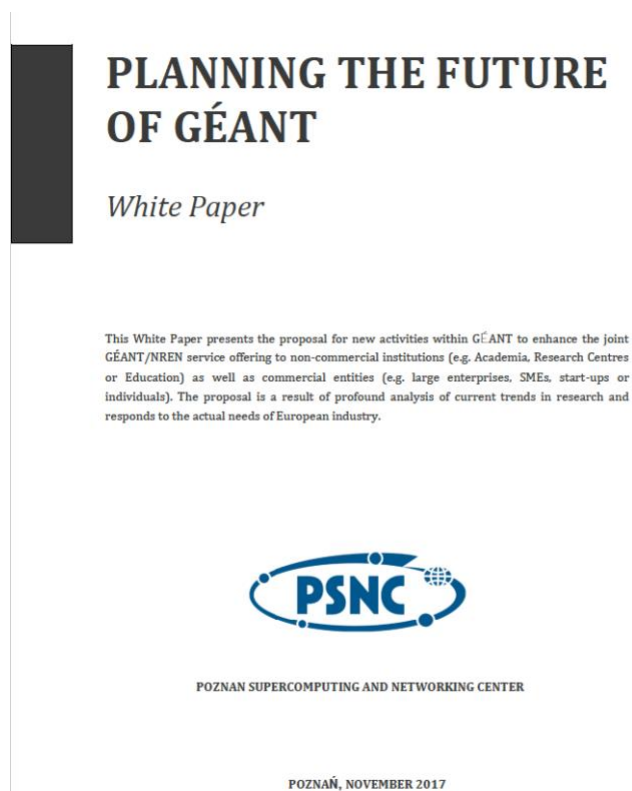


Fig. 19. PSNC White Paper for GÉANT project.

This white paper is PSNC's contribution to the new chapter of the GÉANT project. The paper discusses new topics, not yet covered by the GÉANT project, which have significant impact on potential

future applications of the GÉANT infrastructure in the European landscape of entrepreneurs, industry and academia. The new areas proposed in this white paper, if implemented in the project, can significantly enhance the joint GÉANT/NRENs offering to non-commercial and commercial entities, allowing them to use beyond state-of-the-art infrastructure to test and validate new solutions, not yet available on the market. The white paper proposes the following new thematic domains for consideration while planning future activities of GÉANT:

1. Support to the Next Generation Internet research,
2. A distributed ledger infrastructure as a testing environment for researchers,
3. A distributed infrastructure to support research on distribution of time and frequency signals,
4. Quantum Key Exchange – a key element of a new Pan-European testbed for academia and industry,
5. **Pre-Commercial Procurement for GÉANT and NRENs,**
6. Platforms and Pilots,
7. Support to Digital Innovation Hubs in GÉANT.

Following The White Paper, PSNC has prepared a specific proposal for carrying out PCP activities within the GÉANT framework, with active support by CESNET and GRNET.

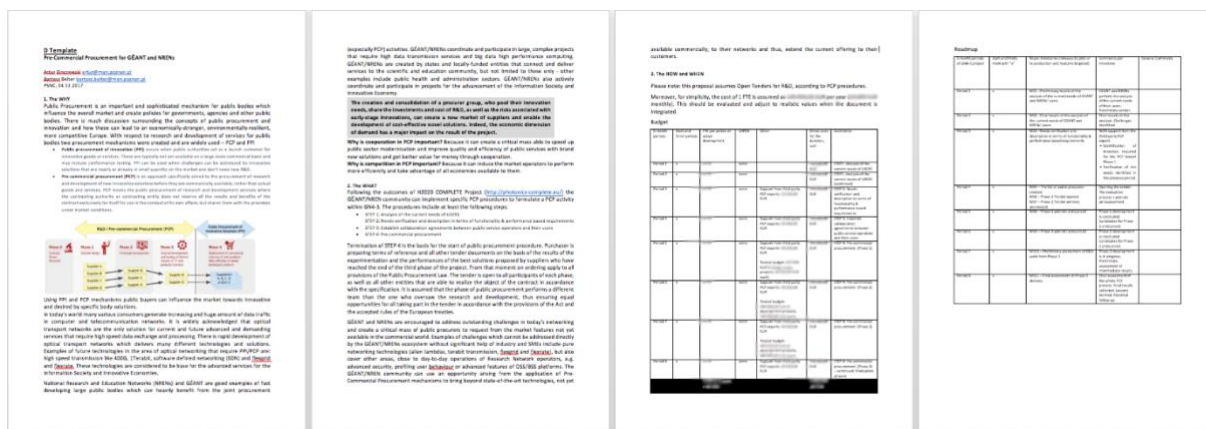


Fig. 20. PCP/PPI chapter in PSNC White Paper for the GÉANT project.

This proposal is under internal discussions and, if agreed, may be implemented from January 2019.

4.2 Collaboration with other public network operators

Project Partners continued to organize meetings with local public networks and operators in the respective countries. The purpose of these meetings was unchanged and remained as to start collaboration with potential users of the COMPLETE project framework. CESNET has continued to collaborate with the ROWANet network. PSNC has continued meetings with the WSS local broadband public network. GRNET has further collaborated with the state owned SYZEFKISIS network.

Collaboration between NRENs and public network operators is beneficial for both Parties and as an example cooperation between CESNET and ROWANet network is presented.

The ROWANet is a network implemented with collaboration between an NREN and a public provider. It is the Regional Optical Telecommunications Backbone Network, which is a regional public fibre network based on a system of optical fiber routes containing passive CWDM/DWDM technology and active elements. ROWANet provides network services to public sector organizations (the regional and local government, state authorities, schools, rescue systems, hospitals, etc.) and non-profit organizations in the Vysočina Region (Czech Republic). Of course, and again, this system utilizes, as the university fibre networks, the fundamental connection to the CESNET2 optical backbone with all its benefits. The optical infrastructure enables economic future-proof solutions which are highly profitable for the regional organizations, from a mid-term point of view. The Czech Light optical transmission system is used to light the ROWANet regional dark fibre infrastructure, and, among others, enables the open access to network design, and remote control of the network elements' operation, which can be easily embraced as well. The ROWANet operator benefits from the cost efficiency of the system as well. Price was a high priority criterion within the procurement where the Czech Light transmission system was chosen.

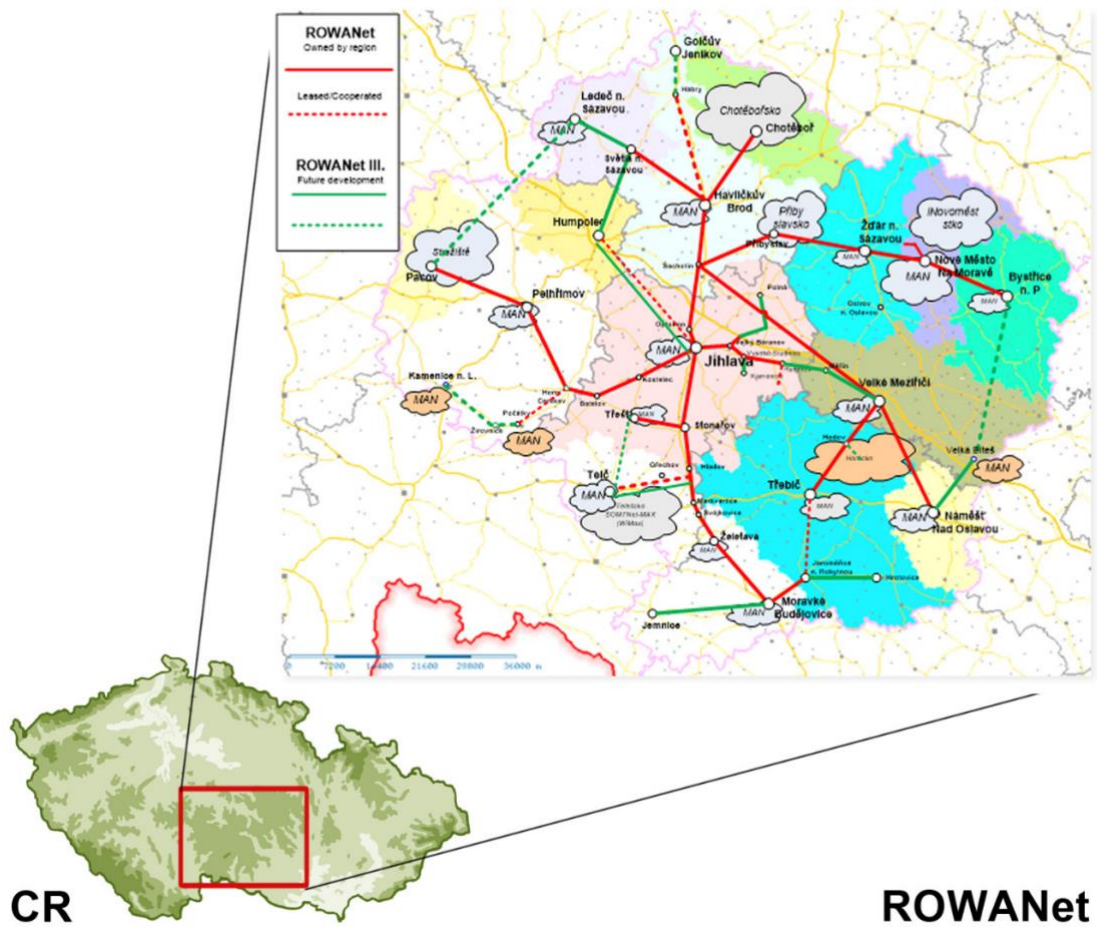


Fig. 21. ROWANet network.

The main assumption was that the core partners of COMPLETE are NRENs themselves. This creates unique opportunities to establish a direct relationship with other NRENs in order to discuss common needs, interests and opportunities for joint procurement actions. COMPLETE partners continued direct meetings with NRENs as reported in the sections above and events.

<i>Corresponding KPIs</i>	<i>Short description</i>	<i>Involved partners</i>	<i>Achievements</i>
Number of NRENs contacted: 5	COMPLETE disseminated information about upcoming PCP/PPI-related opportunities for NRENs.	PSNC, CESNET, GRNET	Contacted NRENs (8): SURFNet, NORDUNet, SWITCH, RENATER, DFN AMRES HEANET UNINET
Number of other public network operators contacted: 3	NRENs are not the only target of COMPLETE. Project partners disseminated the knowledge, experience and information to other, usually local public network operators	PSNC, CESNET, GRNET	Contacted public network operators (4): ROWANET, WSS, GÉANT, SYZEFIX

4.3 Collaboration with vendors

Collaboration with vendors and equipment providers remained one the most important elements of the COMPLETE project. The meetings have resulted with signed NDAs, meetings, tests, demos and an information database regarding the latest and updated solutions in the optical transport equipment and services. The goal of the meetings was to discuss possible future solutions, tests and directions that will best suit the specified user requirements.

The project partners have continued to collaborate with the following leading market vendors: ADVA Optical Networking, Cisco Systems, Coriant, Czech Light, ECI Telecom, Huawei and Lumentum. New equipment tests have been conducted and reported in NREN community and conferences. News tests have been scheduled to be performed in 2018. Equipment tests with ADVA Optical Networking, Coriant, ECI Telecom and Lumentum equipment have been reported in the COMPLETE project deliverable D2.7.

COMPLETE partners, acting as NRENs, have already established good relationship with industry, and specifically with optical network equipment vendors. Within the project lifetime, this collaboration continued to be extended, fulfilling requirements expressed by third party network operators. Together with the vendors contacts, COMPLETE partners collaborated also with components manufacturers – FINISAR, ACACIA, Lumentum (in some cases together with system vendors – like ADVA, for example, regarding the optics modules development).

The cooperation with vendors was reported in project deliverables. The database was updated with specific results of cooperation with vendors.

<i>Corresponding KPIs</i>	<i>Short description</i>	<i>Involved partners</i>	<i>Achievements</i>
<i>Number of NDAs signed between the consortium members and vendors: 2</i>	Cooperation with vendors is very important for potential planning of PPI-related projects. The consortium would like to formalize this collaboration with vendors by signing NDAs to access confidential materials, which are not publicly available on the vendors' websites.	PSNC, CESNET, GRNET	Signed NDAs (2): ECI Lumentum
<i>Number of vendors described in High-tech R&D roadmap reports: 3</i>	Indicative number of vendors which have been analysed and described in the technical deliverables	PSNC, CESNET, GRNET	Number of vendors described in High-tech R&D roadmap reports (7): ADVA Optical Networking, Cisco Systems, Coriant, Czech Light Lumentum, ECI Telecom, Huawei

PSNC, together with ADVA, Juniper and GÉANT, has prepared the following presentation at the TNC2017 conference. The published flyer was presented on Fig. 4

5 Conclusions

This document reports the COMPLETE dissemination and collaboration activities during the second part of the project duration, after the first 18 months of the project. The following table presents the COMPLETE dissemination achievements with reference to the KPIs defined at the deliverable D3.1. “Dissemination & Collaboration Plans” and D3.4. “Updated Dissemination & Collaboration Plans”.

<i>KPI</i>	<i>Target</i>	<i>Achievement</i>	<i>KPI fulfilment percentage</i>	<i>Notes</i>
<i>Number of attended events</i>	12	5	42 %	Conferences: ECOC 2016, OFC 2017, CLEO 2017, ICTON 2017, SPIE 17, OIF 2017 were not attended with respect to COMPLETE activities. The conference OFC 2018 will take place in March 2018, after the project end.
<i>EC concertation events</i>	3	3	100%	<u>For PSNC:</u> “Annual Concertation Meeting of on-going innovation

				<p>procurement projects”</p> <p>08-09.03.2017</p> <p><u>For CESNET:</u></p> <p>“Workshop for innovation procurement in public construction”</p> <p>14th Nov 2017 City Hall, Prague, Czech Republic</p> <p><u>For GRNET:</u></p> <p>“2nd Major EAFIP Event on Innovation Procurement”</p> <p>18th - 19th Oct, 2017, Athens, Greece</p>
<i>Number of booths in events</i>	1	1	100 %	The project booth at the TNC2017 Conference.
<i>Number of talks in events</i>	1	3	300 %	Talks at TNC2017 conference and at NGON2017 conferences.
<i>Number of vendors approached (in discrete events)</i>	31	21	68 %	<p>Overall number of approached vendors at events.</p> <p>4 vendors are planned for OFC 2018 conference that will take place in March 2018.</p>
<i>Unique visitors in events</i>	410	1470	358 %	Visitors at events according to statistics

				on the event website.
Number of posters in events	3	1	33 %	ICTON 2016 poster: “Pre-Commercial Procurement in Optical Networking domain” CLEO 2017, ICTON 2017 conferences were not attended with respect to COMPLETE activities.
Number of papers	1	1	100 %	ICTON 2016 conference paper. “Pre-Commercial Procurement in Optical Networking domain”
Collaboration with other projects working on PCP/PPI	1	1	100 %	Collaboration with PRACE project.
Number of NRENs which received information about upcoming PCP/PPI-related opportunities for NRENs	5	8	160 %	SURFNet, NORDUNet, SWITCH, RENATER, DFN, AMRES, HEANET, UNINET
Number of contacted local public network operators	3	4	133 %	ROWANET, WSS, GEANT, SYZEFXIS
Number of NDAs signed between the consortium members and vendors	2	2	100 %	Agreement with: ECI, Lumentum
Number of vendors described	3	7	233 %	Roadmaps for: ADVA Optical Networking, Cisco

<i>in High-tech R&D roadmap reports</i>				Systems, Coriant, Czech Light , ECI Telecom, Huawei, Lumentum
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As presented in the table above and following the first report on dissemination, almost all the target KPIs were fulfilled and significant part of them by more than 100 %. The missed KPIs are related to the fact that the COMPLETE partners did not participate in some conferences with respect to the project activities and as a result one paper and two posters could not be reported. Additionally, one of the selected conferences – OFC 2018 – will take place in March 2018, after the project end and has not been reported in this deliverable. COMPLETE partners managed to achieve most of the dissemination targets by participating effectively in 5 discrete events in the area of optical communications and advanced network services. During these events, COMPLETE partners had the opportunity to meet representatives of potential users of the COMPLETE platform and vendors. During the reported events the special point of interest was activity with the vendors a large number of meetings was organized and numerous new technologies and activities in the area of optical networking were discussed. Large number of joint tests and activities were planned. The events ECOC 2016 and OFC 2017 were not attended however the KPI related to this participation (approached vendors) was achieved as the COMPLETE partners closely collaborated with the vendors in the form of face to face and electronic meetings. The table above presents also that the full scope (in all target areas), of planned dissemination activities was achieved – face to face and virtual meetings, papers, posters, talks, presentations, white papers, collaboration, social media. It should be noted that the table does not capture the dissemination activities that occurred via the regular GÉANT meetings; at these meetings COMPLETE partners' representatives had the opportunity to present the project scope and results to all GÉANT members.

PARTNERS



CESNET is an association of universities of the Czech Republic and the Czech Academy of Sciences. It operates and develops the national e-infrastructure for science, research and education which encompasses a computer network, computational grids, data storage and collaborative environment. It offers a rich set of services to connected organisations.



GRNET S.A. provides Internet connectivity, high-quality e-Infrastructures and advanced services to the Greek Educational, Academic and Research community. The GRNET backbone interconnects all universities and technological institutions, and many research institutes, as well as the public Greek School Network. The GRNET network is present in global networking for research and education, representing Greece in the Pan-European GÉANT network. GRNET's vision is the development of Education and Research in Greece along with the equal involvement of the R&E communities in the Pan European society of Knowledge, with the provision of modern, advanced and reliable Internet services to all Educational and Research Institutions.



PSNC is the operator of the National Research and Education Network in Poland. The Polish NREN, PIONIER, a nationwide broadband optical network for e-science, represents a base for research and development in the area of information technology and telecommunications, computing sciences, applications and services for the Information Society. It connects 21 Academic Network Centres of Metropolitan Area Networks (MANs) and 5 of the HPC (High Performance Computing) Centres using their own fibre connections in all regions in Poland.

