PIONIER
POLISH OPTICAL INTERNET

PSNC

Beyond Traditional HPC - Towards Federated, Quantum and Exascale Computing

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Consortium PIONIER - Polish Optical Internet

Poznan Supercomputing and Networking Center

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QUANTUM COMMUNICATION ACTIVITIES

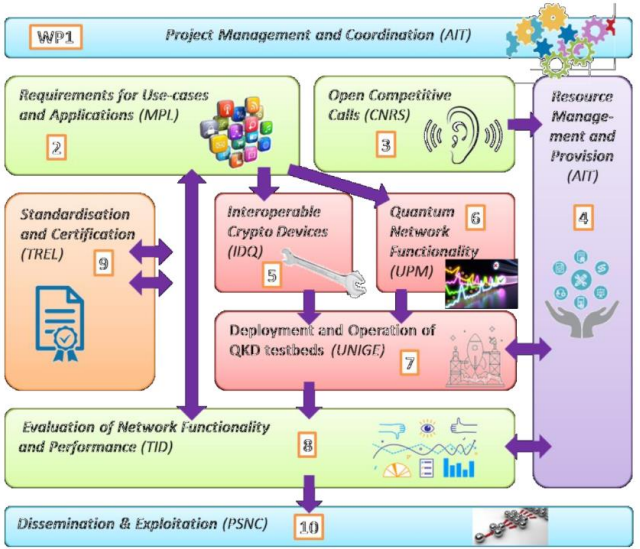
Projects

PSNC takes part in the following projects and activities connected with Quantum Communication and Quantum Key Distribution Technologies:

- **OPENQKD (Horizon2020)**
- **NLPQT (NCBiR)**
- **QUAPITAL**
- **GÉANT**

OPENQKD

- Construction of QKD testbeds in Europe and implementation of 40 different scenarios for services using QKD technology
- Project start - October 2019
- Poznań is one of the main testbeds. Implementation and integration of QKD technology in the existing infrastructure and services of the POZMAN and PIONIER networks.
- Testing experimental QKD solutions in Poznań
- PSNC participates in works related to standardization activities and IPR
- PSNC will develop data management and analysis software
- Testbeds currently running in Geneva, Madrid, Berlin (June 2021). The epidemiological situation has suspended work for the remaining testbeds.



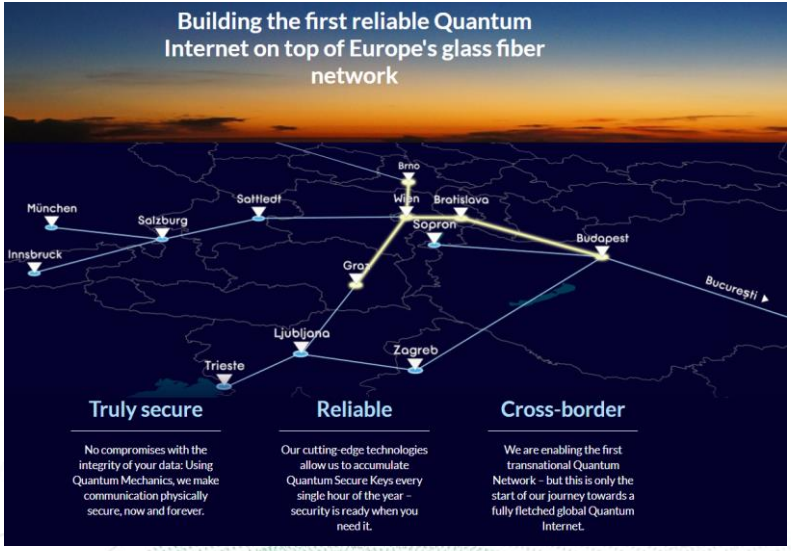
NATIONAL LABORATORY FOR PHOTONICS AND QUANTUM TECHNOLOGIES

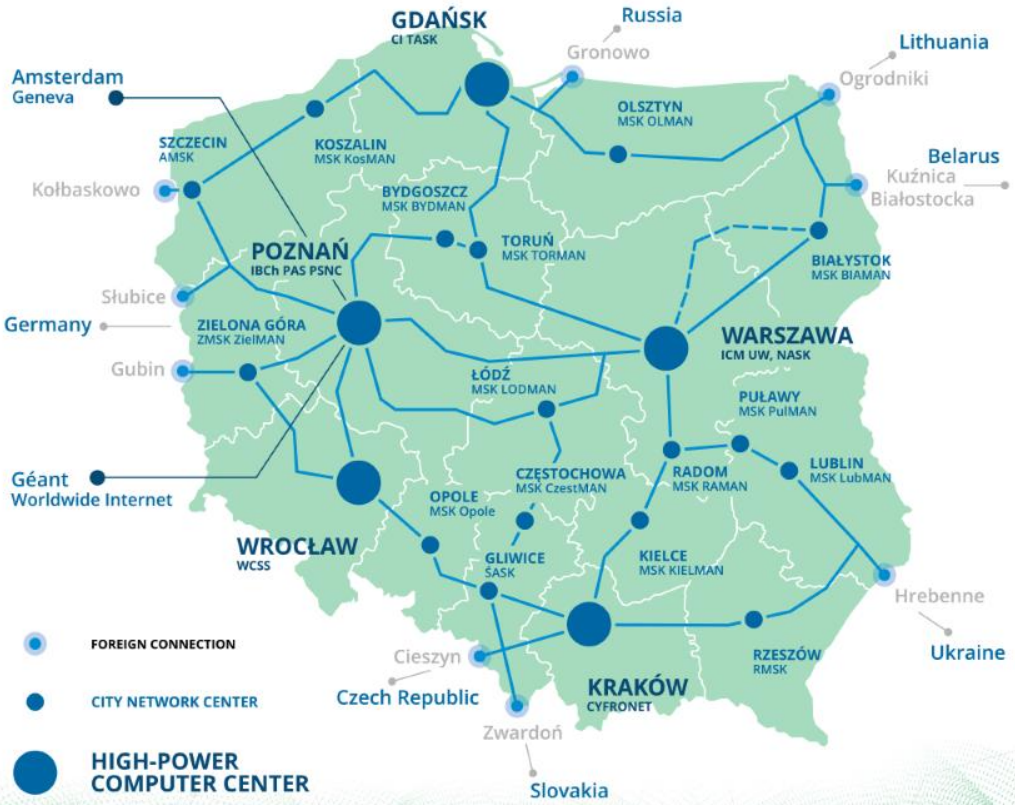
- Construction of metro QKD research and operational infrastructure, integration of QKD solutions
  - QKD infrastructure (operational and R&D QKD devices, encoders and quantum random number generators)

- Construction of the QKD Poznań - Warsaw link
  - experiments related to quantum communication between University of Warsaw nodes and PSNC in Warsaw.
  - Experiments related to sources and detectors of single photons
  - Integration of the infrastructure with the optical carrier infrastructure
  - Next generation QKD prototypes testing (based on enatnglement)

QUAPITAL

- Project related to QKD technology and quantum communication in general.
- Talks on cross-border connections

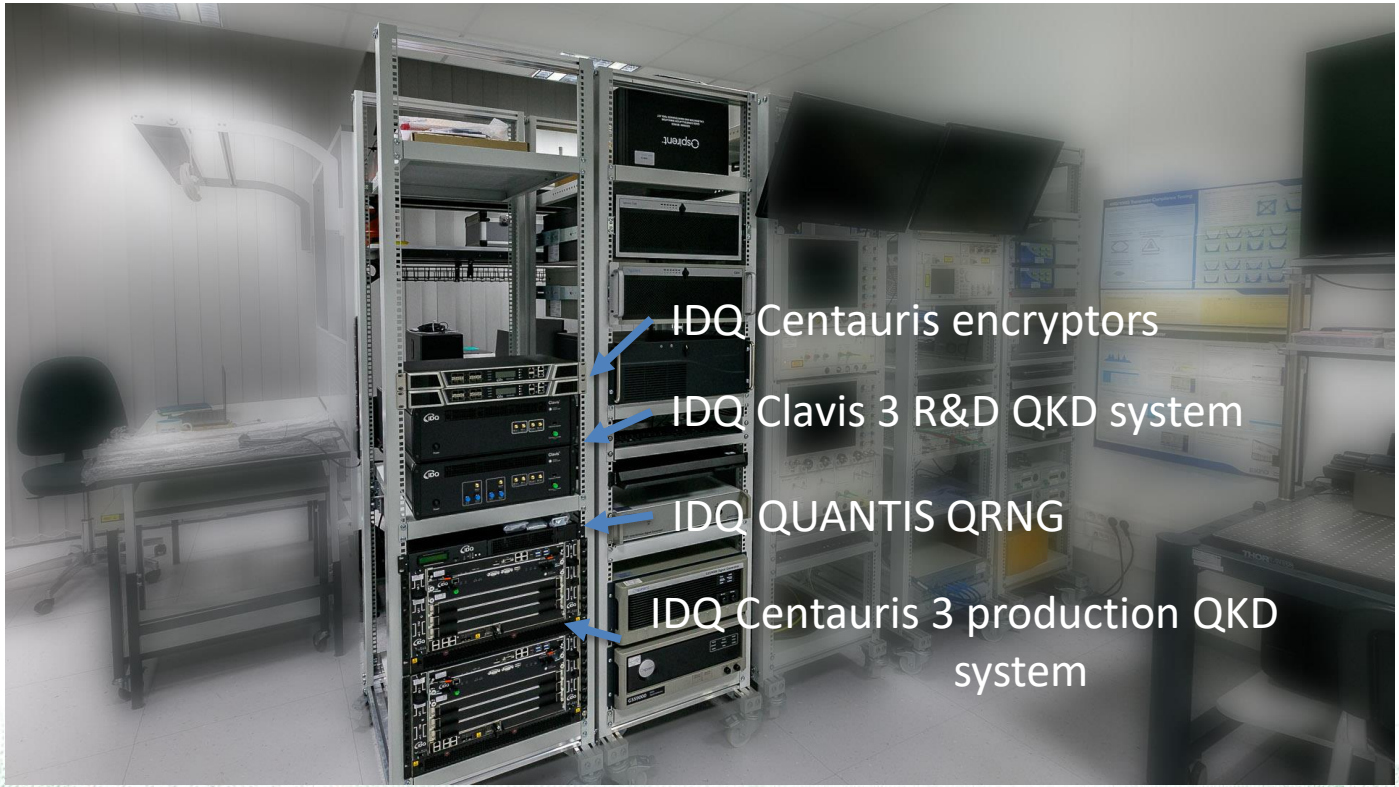




GÉANT

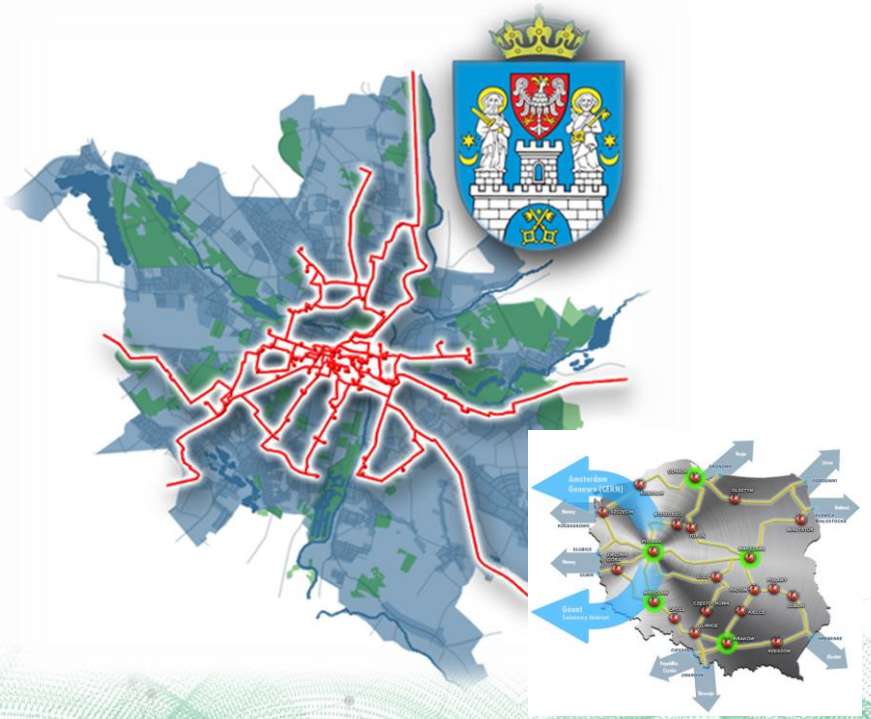
- PSNC is active in the WP6 T1 - QKD task
- Prepared plan, activity proposal for GÉANT and NREN
- Presentations on QKD technology for NRENs
- A survey was conducted among the NRENs on QKD technology to develop a strategy. Common activities, projects, plans and problems were identified
- TNC18/21conference presentaions
- Talks with suppliers of QKD devices: on wider cooperation with NRENs and GÉANT networks
- QCI strategy
- Qauntum networks simulators testbed
- White paper, infoshares for NREN community

PSNC QKD and QRNG equipment



PSNC OPENQKD testbed

- Infrastructure in place as PSNC is owner and operator of the infrastructure and network
- Two QKD links installed and running tests before the final deployment and use cases implementation
- Various use cases are beeing prepared: UC-06, UC-07, UC-08, UC-09, UC-10, UC-11 based on existing services and network. UC with VSB involves QKD cross-border connection. Reference Time and frequency use case involves long distance connection.
- PSNC NOC is working on implementing the monitoring and logging services for QKD infrastructure and services
- SDN solutions currently analyzed
- Real world operational network with shared infrastructure for quantum and classical communication and services. Connection point with other operators and several types and manufacturers of transmission equipment and encryptors
- Direct connection with GEANT node in Poland



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