# QKD LINE IMPLEMENTATION BETWEEN OSTRAVA - CIESZYN

Josef Vojtech CESNET
Piotr Rydlichowski PSNC

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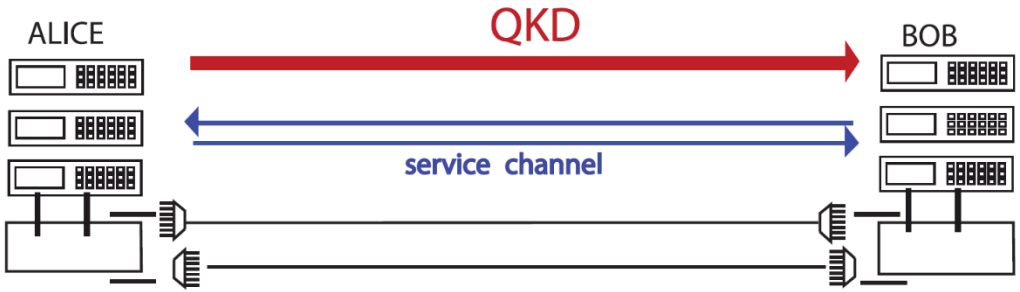
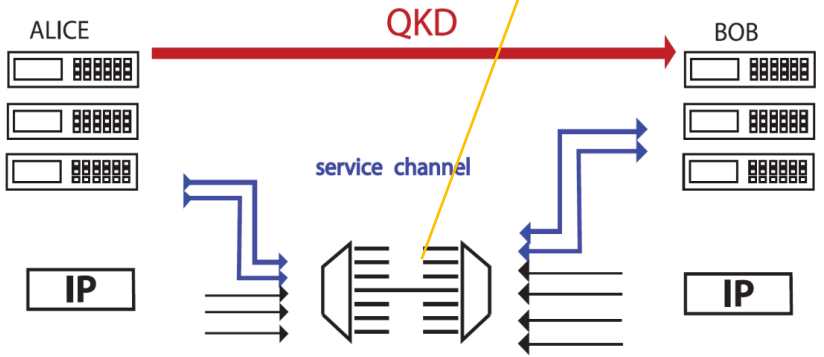
- Ostrava – Cieszyn – trial preparation
  - DWDM
  - Encryptor, management, monitoring
- Ostrava – Cieszyn – lessons learned
- Domestic project: Cyber Security in Post Quantum Era

# TRIAL PREPARATION

- First intercity and international trial in CZ
- Ostrava Cieszyn line – fibre itself 75km, 16 dB
- QKD channel in 1550 nm band, will be disturbed by parallel traffic
- Line is very close to maximum system performance
- QKD system „fibre hungry“, service OOK channel will consume 2 additional optical channels
- Offer for aditional fibre pair uncompetitive
- All data (incl. QKD service channel) moved into bidi DWDM



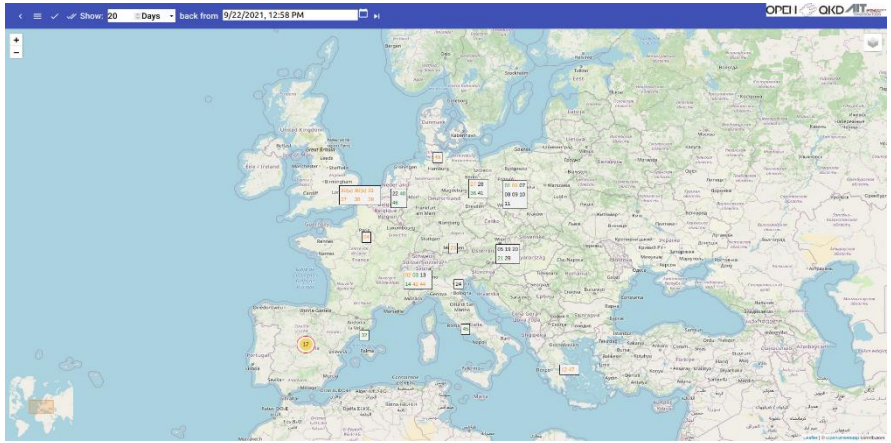
# TRIAL PREPARATION

- PSNC node with QKD system and encryptor is located in Cieszyn
- The QKD-encryptor system is connected to PSNC DWDM node in Cieszyn and encrypted and unencrypted traffic use direct 10G channels to Poznań and PSNC data center
- In Poznań PSNC runs server with management system and services that handle encrypted and unencrypted traffic for the use cases
- The QKD link is constantly monitored and visible in the OPENQKD virtual testbed system

PSNC


GDAŃSK
KOSZALIN
OLSZTYN
SZCZECIN
BYDGOSZCZ
TORUŃ
POZNAŃ
WARSZAWA
ZIELONA GÓRA
ŁÓDŹ
PUŁAWY
RADOM
WROCŁAW
CZĘSTOCHOWA
LUBLIN
OPOLE
KIELCE
KATOWICE
KRAKÓW
RZESZÓW
Russia
Lithuania
Belarus
Germany
Géant
Czech Republic
Slovakia
Ukraine
Management and use case node
DWDM system interconnection
QKD node


IDQ
Home
Dashboard
Quantum node
Events



# QKD TRIAL

- Lessons learned
  - very carefull cleaning, OTDR
  - Verification there is no power in QKD fibre before connecting to BOB, even best powermeter shows no power
  - SP(A)D might be advantage
- Achieved:
  - QBER 2.19%, secret key rate 2kbps

- Trial was extremelly usefull
- Network Cybersecurity in Post-Quantum Era – NeSPoQ (Brno TU, TU Ostrava)
  - Practical applicability of QKD over lines with 100G traffic and optical sensing
  - PQC (post-quantum cryptography) technologies
  - Supervised by National Buro for Cybersecurity
- Ongoing task
  - Definition of scenarios QKD with parallel traffic, different filtering, etc.

cesnet

# Thank You Very Much for Kind Attention!

# Questions Please?

josef.vojtech@cesnet.cz
prydlich@man.poznan.pl