



# **ITU-T** Focus Groups

## **FG-QIT4N: Focus Group on Quantum Information Technology for Networks**

Info session on FG-QIT4N deliverables

06 December 2021

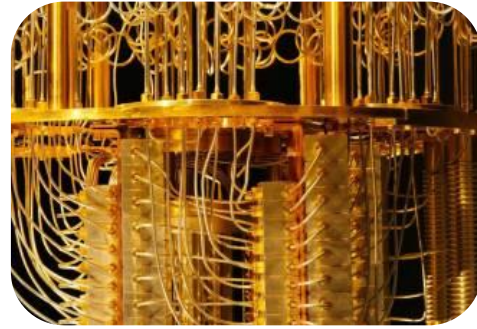
# Technical Report FG QIT4N D1.2

- **Title:** Quantum information technology for networks use cases: Network aspects of quantum information technologies
- **Summary:** It sorts and analyses QIT for network use cases gathered during the lifetime of the ITU-T FG QIT4N
- Link to the **pre-published draft:** <https://www.itu.int/en/ITU-T/focusgroups/qit4n/Documents/D1.2.pdf>
- **Chief editor:** Yuan Gu ([gu.yuan@zte.com.cn](mailto:gu.yuan@zte.com.cn))
- **Co-editors:**
  - Meng Zhang ([zhangmeng@caict.ac.cn](mailto:zhangmeng@caict.ac.cn))
  - Jidong Xu ([xujid@htgd.com.cn](mailto:xujid@htgd.com.cn))

# Network aspects of QIT: use cases



Quantum time synchronization



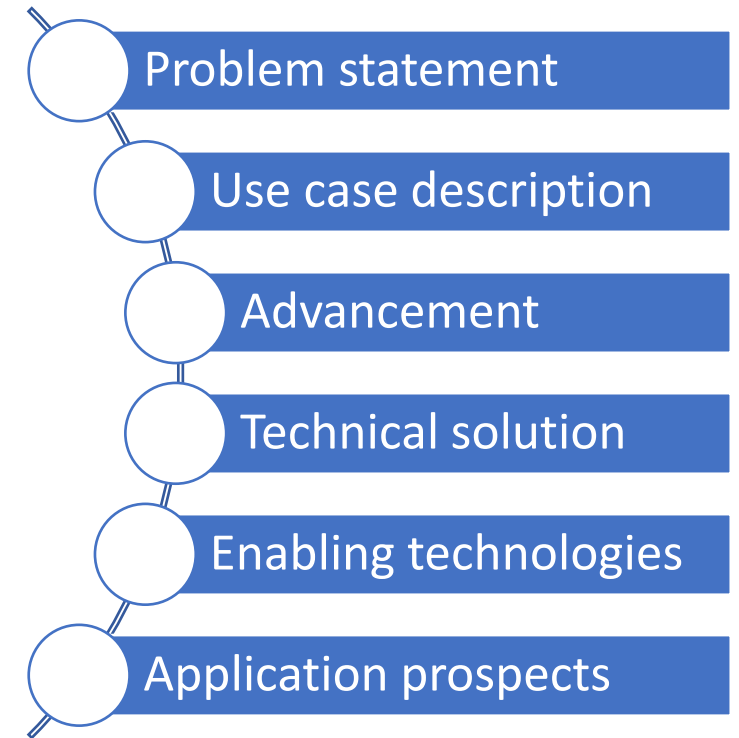
Quantum computing



Quantum random number generator

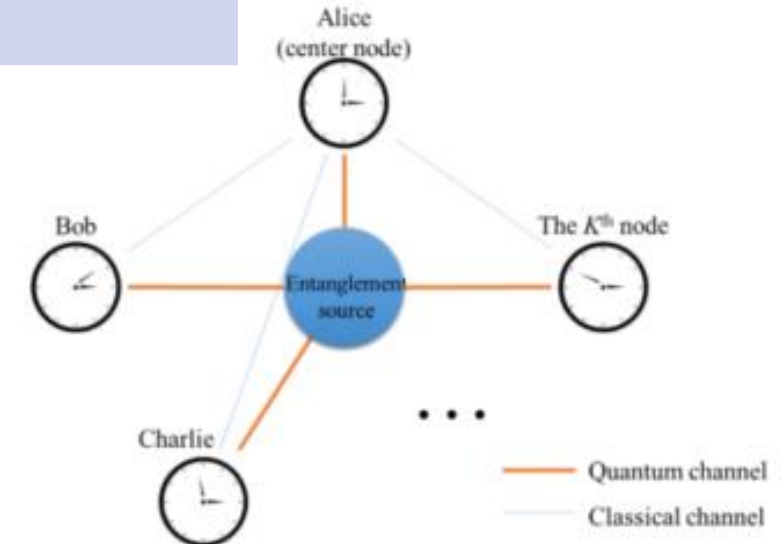
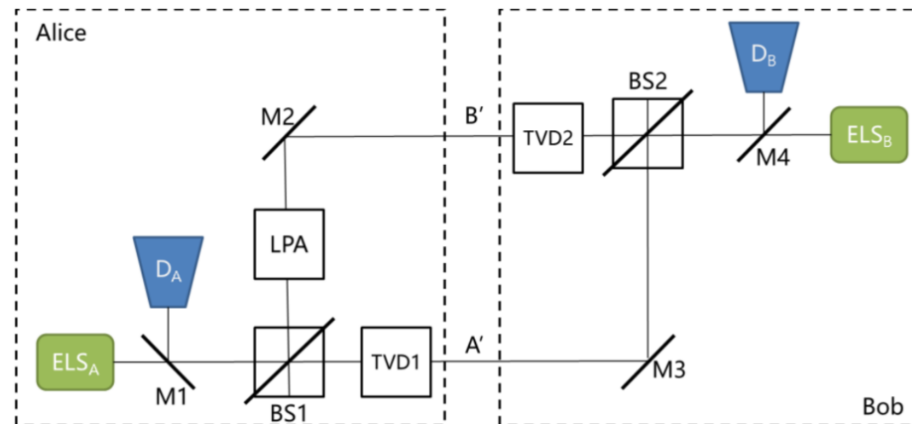


Quantum communication beyond QKD



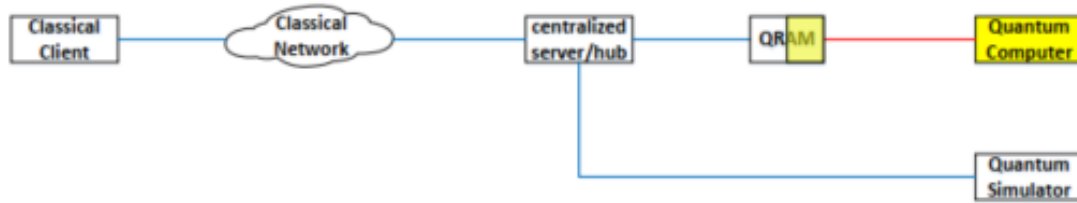
# Quantum time synchronization

Use case	Description	Advantages
Quantum time synchronization	Time synchronization in existing communication networks	Higher precision
Secure quantum clock synchronization	Resist security attacks to clock synchronization	Prevent delay attack
Quantum network of entangled clocks	Quantum frequency/time synchronization in quantum star networks	Synchronize across multiple parties in real time

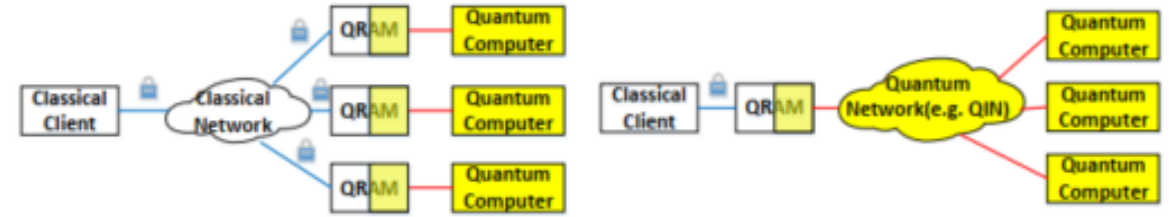


# Quantum computing

Quantum cloud computing



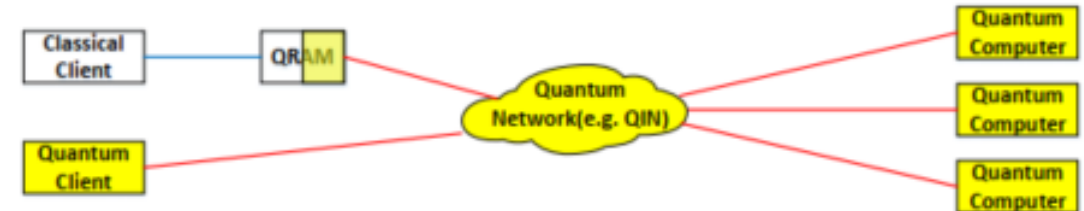
Blind quantum computing



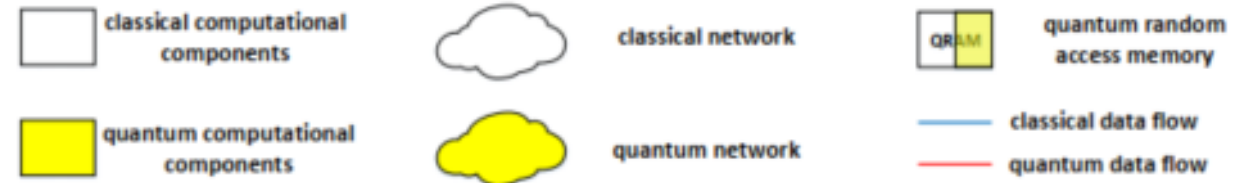
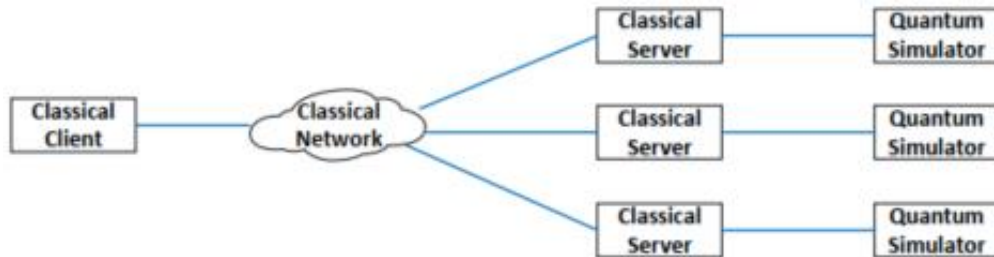
Hybrid classical and quantum computing



Distributed quantum computing

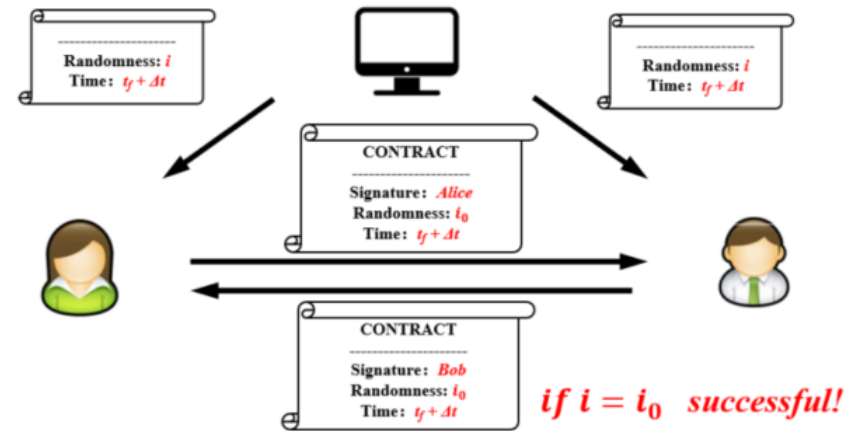
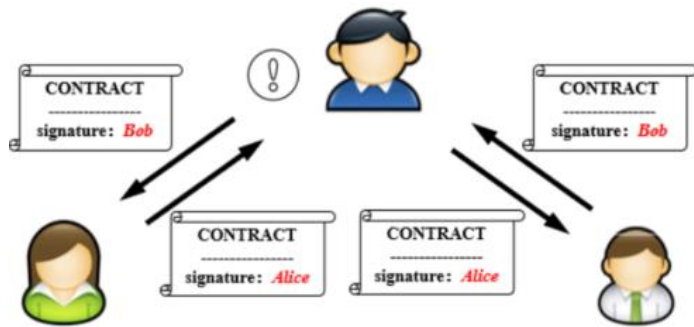


Quantum simulator in centr./dist. quantum computing

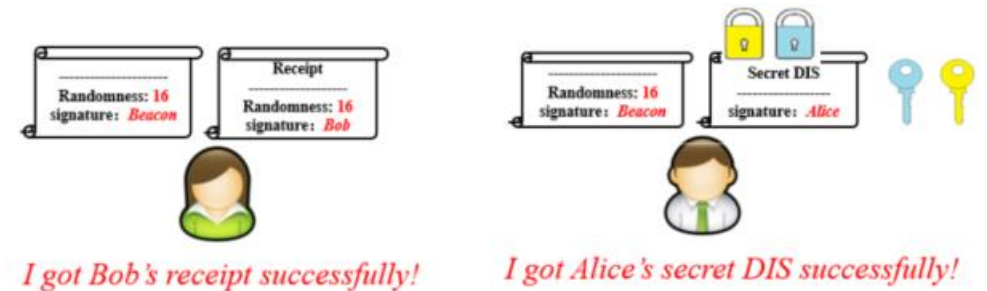
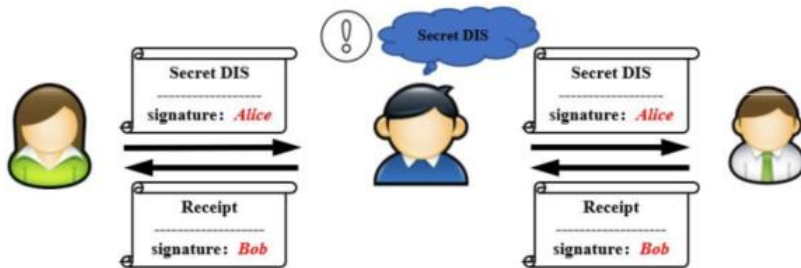


# Quantum random number generator

- Quantum randomness beacon service ...
  - for smart contracts



- for confidential disclosure



# Quantum communication beyond QKD

Use case	Description	Applications	Advantages
Quantum digital signature	Signing classical messages with quantum bits	Authentication Data integrity	Long-term secure Quantum resistant
Quantum anonymous transmission	Sending messages on a quantum network without revealing the sender	Protecting whistleblowers	Private by design
Quantum money	Unforgeable and unclonable tokens object that could be circulated among parties	Secure operations across block chains	Better scaling than distributed ledgers



# Relevance of D1.2 to SG(s)

- **SG11**
  - *Not clear yet?*
- **SG13**
  - Quantum computing
  - Quantum communication beyond QKD
- **SG15**
  - Quantum time synchronization
- **SG17**
  - Quantum random number generator
  - Quantum communication beyond QKD



## For more information:



### Contact:

- The editors via email addresses in the slides, or
- Secretariat at: [tsbfgqit4n@itu.int](mailto:tsbfgqit4n@itu.int)



### Visit the website:

<http://www.itu.int/go/fgqit4n>