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| The International Teleocmmunication Union - Connecting the World. | **International telecommunication union****Telecommunication Standardization Bureau** |  |
|  | Geneva, 15 October 2019 |
| Ref: | **TSB Circular 201** | **To:**- Administrations of Member States ofthe Union;- ITU-T Sector Members;- ITU-T Associates;- ITU Academia |
| Tel: | +41 22 730 5356 |
| Fax: | +41 22 730 5853 |
| E-mail: | tsbfgqit4n@itu.int | **Copy to:**- The Chairmen and Vice-Chairmen of Study Groups;- The Director of the Telecommunication Development Bureau;- The Director of the Radiocommunication Bureau |
| **Subject:** | **Creation of a new ITU-T Focus Group on Quantum Information Technology for Networks (FG-QIT4N) and its first meeting; Jinan, China, 9 - 10 December 2019** |

Dear Sir/Madam,

1 Further to the agreement by ITU-TSAG at its meeting in Geneva from 23 to 27 September 2019, I am pleased to announce the establishment of the [ITU-T Focus Group on Quantum Information Technology for Networks](https://www.itu.int/en/ITU-T/focusgroups/qit4n/Pages/default.aspx) with Prof. Qiang Zhang​ (University of Science and Technology of China), Mr. Alexey Borodin (Rostelecom) and an expert to be nominated by United States as FG-QIT4N Co-Chairmen.

The appointment of vice-chairmen will take place at the first meeting, and shall be primarily based upon demonstrated competence both in technical content of the group and in the management skills required.

2 The Focus Group will study the evolution and applications of QIT for networks; focus on terminology and ​use cases for QIT for networks, provide necessary technical background information and collaborative conditions to effectively support QIN-related standardization work in ITU-T Study Groups and provide an open cooperation platform with ITU-T Study Groups and other SDOs.​​

3 The Focus Group’s lifetime is set for one year from the first meeting and reports to the last TSAG meeting before WTSA-20. It will operate under the procedures set out in [Recommendation ITU‑T A.7](http://www.itu.int/rec/T-REC-A.7) and within the agreed Terms of Reference reproduced in **Annex 1**.

4 **FG-QIT4N is open** to ITU Member States, Sector Members, Associates, Academia and to any individual from a country that is a member of ITU and who is willing to contribute to the work; this includes individuals who are also members or representatives of interested standards development organizations.

Anyone interested in updates and announcements related to this group is invited to subscribe to the **FG-QIT4N mailing list**. Details on how to subscribe can be found on the FG-QIT4N homepage: [https://itu.int/en/ITU-T/focusgroups/qit4n/](https://www.itu.int/en/ITU-T/focusgroups/qit4n/Pages/default.aspx).

5 The first meeting of FG-QIT4Nwill be held in Jinan, China from **9 to 10 December 2019** inclusive.

6 In concurrence with the FG-QIT4NChairman, the **objectives of the first meeting** include:

1. discussion on FG-QIT4N expected deliverables and timeline;
2. review of contributions and initial development of deliverables;
3. organization structure of FG-QIT4N work and leadership;
4. FG-QIT4N work plan and meeting plan.

7 In line with the terms of reference set out in **Annex 1, written contributions are invited** for the first meeting of the Focus Group on Quantum Information Technology for Networks to address the objectives highlighted above and especially to foster an initial development plan of deliverables. Written contributions should be submitted to the secretariat (tsbfgqit4n@itu.int) in electronic format using the template available from the FG-QIT4N homepage. **The deadline is
25 November 2019.**

8 The meeting will **open at 0930 hours** on the first day, and participant registration will begin at 0830 hours. Practical meeting information is set out in **Annex 2**. The meeting agenda will be available from the [FG-QIT4N homepage](https://www.itu.int/en/ITU-T/focusgroups/qit4n/Pages/default.aspx) in advance of the meeting. The discussions will be held in English only.

9 We would remind you that citizens of some countries are required to obtain a visa in order to enter and spend any time in China. If required, visa must be requested before the date of arrival in China from the embassy or consulate representing China in your country or, if there is no such office in your country, from the one that is closest to the country of departure. Deadlines vary, so it is suggested to check directly with the appropriate representation and apply early.

Additional details and documentation needed for visa processing, if any, will be provided in the logistics document for the meeting that will be made available on the FG-QIT4N website.

10 To enable the host to make the necessary logistics arrangements and complete visa procedure, participants are required to **pre-register online** via the [FG-QIT4N homepage](https://www.itu.int/en/ITU-T/focusgroups/qit4n/Pages/default.aspx) as soon as possible, and no later than **25 November 2019**. Please note that pre-registration of participants for the events is carried out exclusively online.

**Key deadlines:**

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| 9 November 2019 | - Submit requests for visa support letters (Please complete pre-registration first (see below); Additional details and documentation needed for visa processing, if any, will be provided in the logistics document for the meeting that will be made available on the FG-QIT4N website) |
| 25 November 2019 | - Pre-registration (online via the [FG-QIT4N homepage](https://www.itu.int/en/ITU-T/focusgroups/qit4n/Pages/default.aspx))- Submit written contributions (by e-mail to tsbfgqit4n@itu.int)  |

I wish you a productive and enjoyable meeting.

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| Yours faithfully,*(signed)*Chaesub LeeDirector of the TelecommunicationStandardization Bureau | Latest meeting information |

**Annexes: 2**

ANNEX 1:

Terms of Reference:
ITU-T Focus Group on Quantum Information Technology for Networks (FG-QIT4N)

(Approved by TSAG on 2019-09-27)

## 1. Rationale and scope

The integration of quantum physics and information technology has forged the so-called quantum information technology (QIT). QIT has promoted the booming of the second quantum revolution and will have a profound impact on ICT networks.

Quantum computation is a new computation model that follows the laws of quantum mechanics to control quantum information units. Combined with the quantum parallelism, quantum information processing has greater potential than classical information processing. Quantum computers represent a breakthrough in Moore's Law, implying enormous computing power potential. Quantum computer has potential applications in many fields, such as optimization over huge data sets and design of new materials and molecular functions.

Quantum communication includes a class of novel communication technologies that is based on the transmission of quantum signals, such as quantum key distribution (QKD), quantum teleportation, quantum repeater. QKD is an area of great interest in QIT application at this moment. Metro/backbone QKD networks have been constructed and satellite-based quantum communication experimental applications have been realized in last decade. In the future, quantum repeater would be an essential building block in constructing distributed quantum computing.

Quantum metrology is the study of measurement techniques that give higher resolution and sensibility in measurements of physical parameters than the same measurement performed in a classical framework.

Quantum information network (QIN) is expected to connect quantum information processing nodes, including QKD nodes, quantum computers and quantum sensors, via quantum communication technologies such as quantum teleportation and quantum repeating, to realize quantum information transmission and networking. QIN has potential to provide series of new applications, such as distributed quantum computing and quantum sensor network.

The ITU-T Focus Group on “Quantum information technology for networks” (FG-QIT4N) would provide a platform to study QIT for networks. It engages researchers, engineers, practitioners, entrepreneurs and policy makers, to take full advantages of ability and potential of QIT in networks.

## 2. Objectives

This Focus Group will provide a collaborative platform for pre-standardization aspects of QIT for the ICT networks, with the following objectives:

* Considering evolution and applications of QIT for networks.
* The topics of study include:
	+ telecom/network aspects of QKD networks that are identified in close coordination with ITU-T SG13 and SG17 as not within the scope of SG13 (QKD network architecture aspects) and SG17 (security aspects of QKD network and applications of QRNG for security).
	+ QIN technology and network evolution.
* The FG outputs will focus on terminology and use cases. The FG will reference relevant terminology defined in the pertinent ITU-T SGs. When necessary, the FG will liaise with the relevant SGs if terminology needs to evolve to take into account technology evolution.
* To provide necessary technical background information and collaborative conditions in order to effectively support QIN-related standardization work in ITU-T study groups.
* To provide an open cooperation platform with ITU-T study groups and other SDOs, including collaborative standardization work, co-located meetings, and workshop on quantum topic.

## 3. Structure

## The FG-QIT4N may establish sub-groups if needed.

## 4. Specific tasks and deliverables

The expected tasks with potential deliverables for QIT4N are listed below:

* To collaborate and cooperate with study groups and other SDOs and sub-groups, such as ETSI ISG-QKD, ETSI TC Cyber, IEEE, ISO/IEC JTC 1/SC 27/WG3, ISO/IEC JTC1 AG4, IETF, IRTF.
* To develop technical report(s) about evolution and applications of QIT (e.g., quantum computing, quantum communication) for networks.
* To develop technical report(s) on telecom/network aspects of QKD networks that are identified in close coordination with ITU-T SG13 and SG17 as not within the scope of SG13 (QKD network architecture aspects) and SG17 (security aspects of QKD network and applications of QRNG for security), focused on terminologies, new use cases, protocols and transport technologies.
* To develop technical report(s) on the evolution of QIN focused on terminologies and use cases.
* To organize thematic workshops on QIT for networks, which will bring together interested stakeholders to promote the FG activities, and encourage both ITU members and non-ITU members to jointly contribute on this topic.

## 5. Relationships

This Focus Group will work in close collaboration with all ITU-T study groups, especially SG13, SG17, SG15, SG2 and SG11.This FG-QIT4N will collaborate with relevant entities, in accordance with Recommendation ITU-T A.7.

These entities include the following: SDOs, industry forums and consortia (such as ISO/IEC JTC 1/SC 27/WG3, ISO/IEC JTC1 AG4, ETSI ISG-QKD, ETSI TC Cyber, IEEE-SA, IETF, IRTF), tech companies, academic institutions, research institutions and other relevant organizations.

## 6. Parent group

The parent group is **TSAG**.

## 7. Leadership

See clause 2.3 of Recommendation ITU-T A.7.

## 8. Participation

See clause 3 of Recommendation ITU-T A.7. A list of participants will be maintained for reference purposes and reported to the parent group.

It is important to mention that the participation in this Focus Group has to be based on contributions and active participation.

## 9. Administrative support

See clause 5 of Recommendation ITU-T A.7.

## 10. General financing

See clauses 4 and 10.2 of Recommendation ITU-T A.7.

## 11. Meetings

The schedule and location of meetings will be determined by the Focus Group and the overall meetings plan will be announced after the approval of the terms of reference. The Focus Group will work electronically using teleconferences and with face-to-face meetings. Meetings will be held as determined by the Focus Group and the meetings will be announced by electronic means (e.g., e-mail and website, etc.) at least four weeks in advance.

## 12. Technical contributions

See clause 8 of Recommendation ITU-T A.7.

## 13. Working language

The working language is English.

## 14. Approval of deliverables

See clause 10.1 of Recommendation ITU-T A.7.

## 15. Working guidelines

See clause 13 of Recommendation ITU-T A.7.

## 16. Progress reports

See clause 11 of Recommendation ITU-T A.7.

## 17. Announcement of Focus Group formation

The formation of the Focus Group will be announced via TSB Circular to all ITU membership, via the ITU-T News log, press releases and other means, including communication with the other involved organizations.

## 18. Milestones and duration of the Focus Group

The Focus Group lifetime is set for one year from the first meeting and reports to the last TSAG meeting before WTSA-20. See ITU-T A7, clause 2.2.

## 19. Patent policy

See clause 9 of Recommendation ITU-T A.7.

**ANNEX 2**
**First meeting of ITU-T FG-QIT4N:**

**Jinan, China, 9-10 December 2019**

**Practical meeting information for participants**

**WORKING METHODS AND FACILITIES**

**DOCUMENT SUBMISSION AND ACCESS:** The meeting will be run paperless. Written contributions are encouraged and should be submitted by e-mail to tsbfgqit4n@itu.int by **25 November 2019** at the latest using the document template available on the [FG-QIT4N homepage.](https://www.itu.int/en/ITU-T/focusgroups/qit4n/Pages/default.aspx) Access to all input and output documents will be provided from the [collaboration site for FG‑QIT4N](https://extranet.itu.int/sites/itu-t/focusgroups/qit4n/SitePages/Home.aspx) (ITU TIES or Guest account required, see FG-QIT4N homepage).

**WIRELESS LAN** facilities are available at the meeting venue.

**PRE-REGISTRATION**

**PRE-REGISTRATION:** Pre-registration for on-site participation is to be done via the FG‑QIT4N homepage **no later than 25 November 2019.**

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