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STUDY GROUP 13

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Geneva, 28 June 2019

TD

Source: Rapporteur

Title: Meeting report of Q16/13 (Geneva, 28 June 2019)

Purpose: Admin

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Keywords: Report; Q16/13; June 2019

Abstract: This document contains the meeting report for Q16/13 which is held in Geneva, 17 – 28 June 2019.

CONTENTS

1. Question 16/13 – Knowledge-centric trustworthy networking and services

Question 16/13 was addressed in 31 sessions during the SG 13 Rapporteurs group meeting in Geneva (17 – 28 June 2019) under the chairmanship of Gyu Myoung LEE (Korea (Rep. of)). The group adopted the agenda in **TD6 (RGM)**.

The objectives for this meeting were:

– To carefully review the draft Recommendation (Y.QKDN_FR) for consent;

– To review the progress of on-going draft Recommendations (Y.QKDN_KM, Y.QKDN_Arch, Y.dv-ess, Y.energy-brokerage, Y.trust-index, Y.trust-arch, Y.trust-pdm, Y.PII-Did);

– To review new work items (Software Defined Quantum Key Distribution Networks, Control and Management for QKDN, Open Bootstrap Framework);

– To discuss other items including liaisons.

Question 16/13 discussed 23 contributions and incoming Liaison Statements. Q16/13 has decided to forward Y.QKDN_FR for requesting consent to the WP3/13 meeting. Further details are available in clause 4.1. Q16/13 has decided to start the development of 2 new draft Recommendations and adopt 1 living list item after discussion on 3 new work items. At the meeting, Q16/13 produced 15 output documents including the meeting report.

The main results of the meeting are the following:

– The draft Recommendation ITU-T Y.3800 (Y.QKDN_FR) for consent (**TD 264/WP3**), Framework for Networks to supporting Quantum Key Distribution;

– The updated draft Recommendation ITU-T Y.QKDN_KM (**TD 263/WP3**), Key management for Quantum Key Distribution network;

– The updated draft Recommendation ITU-T Y.QKDN_Arch (**TD 262/WP3**), Functional architecture of the Quantum Key Distribution network;

– The updated draft Recommendation ITU-T Y.dv-ess (**TD 265/WP3**), Framework of distributed virtualized energy storage systems;

– The updated draft Recommendation ITU-T Y.energy-brokerage (**TD266/WP3**), Framework of trusted electricity brokerage for distributed energy resources;

– The updated draft Recommendation ITU-T Y.trust-index (**TD 267/WP3**), Trust index for ICT infrastructures and services;

– The updated draft Recommendation ITU-T Y.trust-arch (**TD 268/WP3**), Functional architecture for trust enabled service provisioning;

– The updated draft Recommendation ITU-T Y.trust-pdm (**TD 269/WP3**), Framework for Trust based Personal Data Management Platform;

– The updated draft Recommendation ITU-T Y.PII-Did (**TD 270/WP3**), Prioritization based De-Identification methods for Personally Identifiable Information;

– The initial draft Recommendation ITU-T Y.QKDN_SDNC (**TD 271/WP3**), Software Defined Network Control for Quantum Key Distribution Networks;

– The initial draft Recommendation ITU-T Y.QKDN_CM (**TD 272/WP3**), Control and Management for Quantum Key Distribution Networks (QKDN-CM);

– Living list (**TD 273/WP3**), Open Bootstrap Framework enabling trustworthy networking and services for distributed diverse ecosystem;

– Outgoing LS (**TD 274/WP3**), LS/o on work progress on Quantum Key Distribution (QKD) network in SG13 [from ITU-T SG13];

– Outgoing LS (**TD 275/WP3**), LS/o on work progress on de-Identification service aspects for Personally Identifiable Information [from ITU-T SG13];

– Q16/13 meeting report (**TD 276/WP3**).

2. Results

2.1 Recommendations for Approval under TAP

No Recommendations were considered under TAP approval at this meeting.

2.2 Recommendations proposed for Consent in accordance with Rec. A.8.

The following Recommendation was proposed by Q16/13 for Consent by WP3:

Description	Documents	Question
Draft Recommendation ITU-T Y.3800 (Y.QKDN_FR), “Framework for Networks to supporting Quantum Key Distribution”	TD 264/WP3	Q16/13

2.3 Other documents for Approval

No Supplement were proposed by Q16/13 for Approval by SG 13.

3. Outgoing liaison statements

The following is a summary of the outgoing Liaison Statements prepared by Q16/13.

Title	Destination	Purpose	Document	Source
LS/o on work progress on Quantum Key Distribution (QKD) network in SG13 (as of June 2019) [from ITU-T SG13]	ITU-T SG2, ITU-T SG11, ITU-T SG17, ETSI ISG-QKD, ISO/IEC JTC1/SC27	Information	TD 274/WP3	Q16/13 Rapporteur
LS/o on work progress on de-Identification service aspects for Personally Identifiable Information [from ITU-T SG13]	ITU-T SG2	Information	TD 275/WP3	Q16/13 Rapporteur

4. Discussions

4.1 Y.QKDN_FR (Quantum Key Distribution Network - Framework)

Base document: TD 246/WP3

C-88	National Institute of Information and Communications Technology (NICT); NEC Corporation; Toshiba Corporation	Proposed consent of the draft Recommendation ITU-T Y.QKD_FR "Framework for Networks to supporting Quantum Key Distribution"	Q16/13

- This contribution proposes to consent the draft Recommendation ITU-T Y.QKDN_FR: "Framework for Networks to support Quantum Key Distribution" with editorial improvements. (SG13-TD246/WP3).

C-112	Korea (Rep. of)	Preparation for consent to Draft Recommendation ITU-T Y.QKDN_FR: "Framework for Networks to supporting Quantum Key Distribution"	Q16/13

- This contribution proposes preparation for consent to Draft Recommendation on "Framework for Networks to supporting Quantum Key Distribution".

C-151R1	SK Telecom	Modification and comments on Draft Recommendation Y.QKDN_FR	Q16/13

- This contribution contains a revised Draft Recommendation Y.QKND_FR for the consistency and clarification of the document and for the consideration of QKD network operation.

C-152	Telefónica S.A.; Huawei Technologies Co., Ltd.; SK Telecom; British Telecommunications Public Ltd. Co. (BT Plc)	Objections to Y.QKDN_FR	Q16/13

- This contribution proposes improvements to the Draft Recommendations Y.QKDN_FR, Framework for Networks to support Quantum Key Distribution (QKD).

C-666R1 (WP3 Meeting)	Telefónica S.A.	Objections to Y.QKDN	Q16/13

- This contribution proposes a reflexion period to analyse the Draft Recommendations Y.QKDN_FR, Framework for Networks to support Quantum Key Distribution (QKD).

Meeting Result

– Based on all input contributions on Y.QKDN_FR, the meeting has carefully reviewed several times the drafting results for requesting the consent of this document in WP3 plenary meeting.

– Q16/13 has decided that this document can be forwarded for consent at the WP3/13 plenary meeting.

The Draft Amendment to Recommendation ITU-T Y.3800 (formerly Y.QKDN_FR) <Framework for Networks supporting Quantum Key Distribution>, which is proposed for consent:

– has been thoroughly reviewed for technical accuracy;

– is technically sound with as few options as feasible;

– has content that does not conflict with the content of an already approved Recommendation;

– does not contain case studies within the normative part;

– has only short illustrative examples, if necessary, included in the normative part;

– follows the author's guidelines (including the use of ITU-T templates, which can be found at: http://www.itu.int/ITU-T/studygroups/templates/index.html)

– has been spell-checked and is grammatically correct, to the extent practicable;

– contains definitions that have been developed after consulting the ITU-T Terms and Definitions database and following the guidance of the standardization committee for vocabulary (SCV);

– has all acronyms, including those in the figures and tables, correctly spelled out;

– has the normative part making use of all references in clause 2 (References);

– has all references in clause 2 (References) qualified in accordance with [ITU-T A.5].

NOTE – IPR statement from NEC was received on this document.

– At the meeting, UK did not agree to go for requesting consent.

  - Text for meeting report considering Y.3800 The UK believes that the decision to consent Y.QKDN_FR (Y.3800) should be taken at the SG13 meeting in October. The document has been discussed and reviewed over three days, and whilst it has improved during this meeting of Q16/13, the text has changed considerably. Indeed changes to definitions were occurring less than two hours prior to the decision in the question to consent. The view of the UK is that given the level and technical nature of the changes to the draft text, Y.3800 cannot be considered stable or mature. The UK reserves the right to raise this issue at the WP3 plenary.

4.2 Y.QKDN_KM (Quantum Key Distribution Network – Key Management)

Base document: TD 245/WP3

C-95-R3	National Institute of Information and Communications Technology (NICT); NEC Corporation; Toshiba Corporation	Proposed editorial corrections to figures in the draft Recommendation Y.QKDN_KM "Key management for Quantum Key Distribution Network"	Q16/13

- This contribution proposes modifications to the draft Recommendation Y.QKDN_KM "Key management for Quantum Key Distribution Network" (SG13-TD245/WP3).

Meeting Result

– Based on the meeting discussion and several offline drafting sessions, the meeting has decided to revise the diagram on structures of QKD network in align with Y.QKDN_FR.

– In addition, the meeting has agreed to revise diagrams for configurations of QKD network architecture.

4.3 Y.QKDN_Arch (Quantum Key Distribution Network – Functional Architecture)

Base document: TD 244/WP3

C-93R1	National Institute of Information and Communications Technology (NICT); NEC Corporation; Toshiba Corporation	Proposed modifications to the draft Recommendation Y.QKDN_Arch "Functional Architecture of the Quantum Key Distribution Network"	Q16/13

- This contribution proposes the functional architecture model and configurations of QKD network in the draft Recommendation ITU-T Y.QKDN_Arch: "Functional Architecture of the Quantum Key Distribution Network" (SG13-TD244/WP3).

Meeting Result

– Based on the meeting discussion and several offline drafting sessions, the meeting has decided to revise the functional architecture model of QKD network with modifications of functional blocks in QKDN management layer.

– In addition, the meeting has agreed to revise the diagram on functional elements and procedure of key management, along with the definition of the term AAS (Authentication and Authorization Service).

4.4 Y.dv-ess (Energy storage system)

Base document: TD 194/WP3

C-62	KAIST	Y.dv-ess: Proposal for updating a use case in Appendix I	Q16/13

- This contribution proposes updating a use case in Appendix I for draft Rec. Y.dv-ESS by suggesting a new application about energy management from the system operator's perspective.

C-83	ETRI	Proposal of a general architectural model for virtual energy storage systems in Y.dv-ess	Q16/13

- This contribution provides the revised text and figure for a general architectural model of virtualized energy storage systems in Section 8.1 of Y.dv-ess based on TD194/WP3.
- In this contribution, we intend to revise Section 8.1 according to the proposed modifications.

Meeting Result

– From C-62, The meeting agreed to accept the updated use case in Appendix I

– From C-83, The meeting agreed to accept the revised text and figure in Clause 8.1.

4.5 Y.energy-brokerage (Trusted electricity brokerage)

Base document: TD 234/WP3

C-61	KAIST	Y.energy-brokerage: Proposal for adding new use case in Appendix I	Q16/13

- This contribution proposes adding a new use case, which presents the importance of energy broker in power system and propose an operation method in various to achieve various energy user's profit.

C-84	ETRI	Proposal on key stakeholders related to the trusted electricity brokerage platform in Y.energy-brokerage	Q16/13

- This contribution contains the proposed text for key stakeholders related to the trusted electricity brokerage platform in Y.energy-brokerage (TD234/WP3).

C-85	ETRI	Proposal on requirements for trusted electricity brokerage in Y.energy-brokerage	Q16/13

- This contribution contains the proposed text for Section 7 (Requirements for trusted electricity brokerage in trustless environments) in Y.energy-brokerage (TD234/WP3).

Meeting Result

– From C-61, the meeting agreed to accept the proposed new use case in Appendix I.

– From C-84, the meeting agreed to accept the proposed text in Clause 6.2.

– From C-85, the meeting agreed to accept the proposed text in Clause 7.

4.6 Y.trust-index (Trust index)

Base document: TD 162/WP3

C-63	KAIST	Considerations of trust value chain at draft Recommendation Y.trust-index	Q16/13

- This contribution introduces some considerations of trust value chain at Y.trust-index which describe trust index for ICT infrastructure and service.

Meeting Result

– From C-63, the meeting agreed to accept the proposed text in clause 6.

4.7 Y.trust-arch (Trust functional architecture)

Base document: TD 195/WP3

C-101	Korea (Rep. of)	Proposal for modification of section 8 of Y.trust-arch	Q16/13

- This contribution proposes revised trust enabled service provisioning functional architecture and description of section 8.

Meeting Result

– From C-101, the meeting agreed to accept the proposed diagram on functional architecture of trust enabled service provisioning and the related text in clause 8.

4.8 Y.trust-pdm (Trust-based personal data management)

Base document: TD 230/WP3

C-96	KAIST	Y.trust-pdm: considerations about stakeholders and roles for personal data ecosystem model	Q16/13

- This contribution introduces various views about personal data ecosystem, and proposes a personal data ecosystem model which identifies stakeholders and their role.

C-97	KAIST	Y.trust-pdm: proposal to add text on trust indicators and characteristics	Q16/13

- This contribution proposes key trust indicators and their characteristics for trust evaluation for Y.trust-pdm.

C-139	KAIST	Proposed text for a framework architecture for trust based personal data management in Y.trust-pdm	Q16/13

- This contribution provides a brief description for each functional component in a framework architecture for trusted based personal data management in Section 9 of Y.trust-pdm based on the previous output document (TD230/WP3).
- Based on this contribution, it is intended to improve the current Section 9 for more detailed examinations.

C-140	KAIST	Proposal for integrated trust evaluation model in Y.turst-pdm	Q16/13

- This contribution proposes the integrated trust evaluation model for trust based personal data management.
- It is intended to add the proposed evaluation model and the related description in a sub-suction of Section 9 of Y.trust-pdm based on the previous output document (TD230/WP3).

Meeting Result

– From C-96, The proposed text and figure are accepted with modification in clause 7.
  - The informative materials are accepted as new appendix (appendix IV) for further development.
  - The meeting discussed the proposed figure about stakeholders and roles in personal data ecosystem, particularly, the role “regulator”. Since this draft Recommendation should consider technical aspects of personal data management, the proposed role regarding “regulator” is omitted. In addition, an editors’ note is added to invite more contributions related to the personal data ecosystem.

– From C-97, The meeting discussed objective and subjective trust indicators (originated from ITU-T Y.3052) for trust evaluation in personal data ecosystem. The meeting agreed to accepted proposed texts in clause 9.
  - The informative materials are accepted as new appendix (appendix V) for further development.
  - The meeting also discussed how to handle informative materials from the existing references to develop this draft Recommendation. At the last stage of the development, all informative materials, especially from the references, will be carefully reviewed before requesting consent of this document.

– From C-139, The proposed text is accepted with modification.

- Since the contribution proposed new texts about framework architecture without revision marks, the editors were carefully reviewed the proposed text to reflect the proposal in clause 9.1.

– From C-140, the proposed text is accepted with minor modification.

- During the drafting session, editors recognized some common views of C-97 and C-140. However, due to lack of time for discussing the issues regarding trust evaluation, an editors' note is added in clause 9.2 to indicate further work and to invite relevant contributions for the next meeting.

4.9 Y.PII-Did (Personally Identifiable Information - De-Identification)

Base document: TD 230/WP3

C-136	KAIST	Y.PII-Did: Proposed new text for clause 6 about overview of de-identification method	Q16/13

- This contribution discusses the updated clause 6 which elaborates current de-identification standardization by the international organization, issues and methods of the existing de-identification method for Y.PII-Did.

C-137	KAIST	Y.PII-Did: Proposed new text for clause 7 about service scenario of de-identification method	Q16/13

- This contribution discusses clause 7 service scenario which includes service architecture, service consideration and service application method for Y.PII-Did.

C-138	KAIST	Y.PII-Did: Proposed new text for clause 8 about considerations for selecting de-identification method	Q16/13

- This contribution proposes to an updated clause 8 which discusses consideration and issues of the existing de-identification method along with associated suggestions and proposals are also provided for Y.PII-Did.

Meeting Result

– From C-136, the meeting decided to add proposed texts as an updated clause 6 of Y.PII-Did.

– From C-137, the meeting decided to add proposed texts as an updated clause 7 of Y.PII-Did.

– From C-138, the meeting decided to add proposed texts as an updated clause 8 of Y.PII-Did.

4.10 Y.SNS-trust (Trust in Social Networking Services)

Base document: TD 231/WP3

No contribution.

4.11 Socio-technical recommendations (Y.STR)

Base document: TD 164/WP3

No contribution.

4.12 New work items

(1) Software Defined Quantum Key Distribution Networks

C-86	Beijing University of Posts and Telecommunications; CAS Quantum Network Co. Ltd.; Ministry of Industry and Information Technology (MIIT)	Proposed New Draft Recommendation ITU-T Y.SD-QKDN "Software Defined Quantum Key Distribution Networks"	Q16/13

- This contribution proposes the general requirements for software defined QKD networks. Main functional characteristics, SD-QKDN architecture, node model, resource model is also described. Several typical application scenarios are given.

Meeting Result

– From C-86, based on the meeting discussion and several offline drafting sessions, the meeting decided to propose this initial draft Recommendation titled "Software Defined Network Control for Quantum Key Distribution Networks" (Y.QKDN_SDNC) as a new work item to the plenary meeting. (See Annex A for A.1 Justification)

– The UK notes the significant changes to the text of the proposed NWI on Software Defined Control of QKD Networks submitted during this meeting and believes that because the timing of the submissions that revised the text, insufficient time was left for a review of the changes that a decision on the proposed new work item should be deferred until the next meeting of ITU-T SG13 and reserves the right to raise this issue at the WP3 plenary.

– Japan has a concern that the new WI is going to be launched without sufficient review of SDN related works such as Y.3300, which was produced by the significant efforts of the experts including Japanese experts, to identify the gap to be addressed. Therefore, this WI should be progressed based on the careful analysis of SDN related documents and collaboration with SDN related groups.

(2) Control and Management for QKDN

C-158	ETRI	Proposed new work item on "Control and Management for Quantum Key Distribution Network"	Q16/13

- This contribution proposes a new work item on "Control and Management for Quantum Key Distribution network" for the consideration by WP3.
- It is intended to describe a control and management aspects of QKD network for further progress in SG13.

Meeting Result

– From C-158, based on the meeting discussion and several offline drafting sessions, the meeting decided to propose this initial draft Recommendation titled "Control and Management for Quantum Key Distribution Networks" (Y.QKDN_CM) as a new work item to the plenary meeting. (See Annex B for A.1 Justification)

– Japan has a concern that the new WI is going to be launched without the clear target to be addressed in its works. The broadness of the scope of the WI will make confusion and delay of the work due to the overlap with other already agreed work items such as Y.QKDN_arch and Y.QKDN_KM. Therefore, the WI should identify the clear target to be addressed and be progressed not to cause any overlap with these related works.

(3) Open Bootstrap Framework

C-126	India	Open Bootstrap Framework enabling trustful devices, applications and services for distributed diverse ecosystems	Q16/13

- This proposal specifies an Open Bootstrap Framework that will satisfy all present and future trust requirements of network and devices belonging to diverse ecosystem and is also independent of both network technology and mobile network operator.
- This proposal aims to be an enabler for the harmonisation of a trust framework for ITU, 3GPP and One M2M and non 3GPP networks/ technologies.

Meeting Result

– The meeting reviewed the proposal and gave many chances to improve the proposal for initiating a new work item. However, there was no enough time to significantly improve the whole text during the meeting.

– The meeting has agreed to accept the proposal as a living list for inviting relevant contributions in the next meeting in order to start a new work on this topic.

4.13 Incoming liaisons, and others

Other contributions

QALL/13 – No contribution

Incoming liaisons

Q16/13 and others – None.

QALL/13

346-GEN	ITU-T SG5	LS/r on hot topics (reply to TSAG-LS16) [from ITU-T SG5]	QALL/13
345-GEN	ITU-T SG5	LS/i on Meaningful group titles [from ITU-T SG5]	QALL/13
344-GEN	ITU-T SG5	LS/r on ITU inter-Sector coordination (reply to TSAG-LS13) [from ITU-T SG5]	QALL/13
343-GEN	ITU-T SG20	LS/i/r on ITU inter-Sector coordination (reply to TSAG-LS13-E) [from ITU-T SG20]	QALL/13
342-GEN	FG-DPM	LS/o on deliverables of ITU-T Focus Group on Data Processing and Management to support IoT and Smart Cities & Communities (FG-DPM), April 2019 [from FG-DPM]	QALL/13
341-GEN	ITU-T SG16	LS/i on creation of new Question Q12/16 (Visual surveillance systems and services) (to TSAG) [from ITU-T SG16]	QALL/13
339-GEN	ITU-R Study Group (SG) 6	LS/i/r to TSAG on ITU Inter-sector Coordination [from ITU-R Study Group (SG) 6]	QALL/13
338-GEN	ITU-T SG20	LS/i/r on hot topics (reply to TSAG - LS 16 -E) [from ITU-T SG20]	QALL/13
337-GEN	CITS	LS/i on ITS communication standards online database [from CITS]	QALL/13
336-GEN	ITU-T SG11	LS/i/r on ITU inter-Sector coordination (reply to TSAG - LS13) [from ITU-T SG11]	QALL/13
334-GEN	TSAG	LS/i on WTSA-20 preparations [from TSAG]	QALL/13
333-GEN	ITU-T SG11	LS/i on reference table to be used for Conformance and Interoperability testing [from ITU-T SG11]	QALL/13
332-GEN	FG DLT	LS/i on FG DLT deliverables for review and comments (to ITU-T Study Groups and ITU-T Focus Groups) [from FG DLT]	QALL/13
331-GEN	ITU-T SG11	LS/i on call for focal points to ITU-T CASC and candidates ITU-T Recommendations for joint ITU/IEC certification scheme [from ITU-T SG11]	QALL/13

Others – None.

Meeting Result

– The meeting has reviewed the above documents. It was a good chance to introduce several related activities of other groups.

– There was no action for the above documents.

5. Work programme

The meeting agreed to start work on the following new work items:

– Y.QKDN_SDNC "Software Defined Network Control for Quantum Key Distribution Networks"

– Y.QKDN_CM "Control and Management for Quantum Key Distribution Networks"

NOTE - A.1 justifications for new recommendations related to these work items are attached in Annexes.

The currently on-going work items for Q16/13 are as follows:

Acronym	Title	Editor	Priority	Consent / Approval	Reference
ITU-T Y.dv-ess	Framework of distributed and virtualized energy storage systems (New.)	Taein Hwang (tihwang@etri.re.kr), Il Woo Lee (ilwoo@etri.re.kr)	Medium	Jul. 2020	TD 265/WP3
ITU-T Y.trust-index	Trust index for ICT infrastructures and services (New.)	Hyeontaek Oh (hyeontaek@kaist.ac.kr), Jun Kyun Choi (jkchoi59@kaist.edu)	Medium	Jul. 2020	TD 267/WP3
ITU-T Y.STR	Socio-technical recommendations for contributing to socio-economic awareness (New)	Viliam Sarian (sarian@niir.ru)	Medium	Jul. 2020	TD 164/WP3
ITU-T Y.trust-arch	Functional architecture for trust enabled service provisioning (New.)	Hoan Suk Choi, Korea (Republic of), hkrock7904@gmail.com Woo Seop Rhee, Korea (Republic of), wsrhee@hanbat.ac.kr	Medium	Jul. 2020	TD 268/WP3
ITU-T Y.QKDN_FR	Framework for Networks to supporting Quantum Key Distribution (New.)	Hyungsoo KIM, KT corp., hans9@kt.com Kaoru Kenyoshi, NICT, kaoru.kenyoshi@nict.go.jp	Medium	Jun. 2019	TD 264/WP3
ITU-T Y.SNS-trust	Framework for Evaluation of Trust and Quality of Media in Social Networking Services (New.)	Namkyung Lee, ETRI (nklee@etri.re.kr)	Medium	Jul. 2020	TD 231/WP3
ITU-T Y.trust-pdm	Framework for Trust based Personal Data Management Platform (New.)	Hyeontaek Oh, KAIST, hyeontaek@kaist.ac.kr Nakyoung Kim, KAIST, nkim71@kaist.ac.kr	Low	Jul. 2020	TD 269/WP3

Acronym	Title	Editor	Priority	Consent / Approval	Reference
		Jinhong Yang, Inje University/KAIST, sunupnet@kaist.ac.kr			
ITU-T Y.QKDN_Arch	Functional architecture of the Quantum Key Distribution network (New.)	Zhangchao Ma, CAS Quantum Network Co., Ltd., mazhangchao@casquantumnet.com	Medium	Jul. 2020	TD 262/WP3
ITU-T Y.QKDN_KM	Key management for Quantum Key Distribution network (New.)	Kaoru Kenyoshi, NICT, kaoru.kenyoshi@nict.go.jp	Medium	Jul. 2020	TD 263/WP3
ITU-T Y.PII-Did	Prioritization based De-Identification Methods for Personally Identifiable Information (New.)	Yang, Jinhong KAIST, jinhong@inje.ac.kr Onik, Md Mehedi Hassan KAIST, hassan@oasis.inje.ac.kr Kim, Chul-Soo, ETRI charles@inje.ac.kr	Low	Jul. 2020	TD 270/WP3
ITU-T Y.energy-brokerage	Framework of trusted electricity brokerage for distributed energy resources (New.)	Taein Hwang ETRI, tihwang@etri.re.kr, Il Woo Lee ETRI ilwoo@etri.re.kr	Low	Sep. 2021	TD 266/WP3
ITU-T Y.QKDN_SDNC	Software Defined Network Control for Quantum Key Distribution Networks (New.)	Yongli Zhao, Zhangchao Ma and Junsen Lai	Low	Sep. 2021	TD 271/WP3
ITU-T Y.QKDN_CM	Control and Management for Quantum Key Distribution Networks (QKDN-CM) (New.)	Hans Kim, hans9@kt.com, Taesang Choi, ETRI., choits@etri.re.kr, Jaehwan Jin, LGU+	Low	Mar. 2021	TD 272/WP3

In this meeting, the following living list item has been adopted.

– Open Bootstrap Framework enabling trustworthy networking and services for distributed diverse ecosystem (**TD 273/WP3**)

NOTE – Q16/13 has living list items on the following work items:

– Trust framework of trustworthy device selection for data transmission (**TD 479 (WP3/13)**);

– Trust based ICT service and business models (**TD 480 (WP3/13)**).

However, there were no relevant contributions the above existing living lists in this meeting.

6. Future meetings

The following is a summary of the upcoming meetings proposed by Q16/13.

Dates	Place	Host	Q	Objectives
19 – 23 August 2019	TBD	TBD	16/13	– Q16/13 will deal with 12 draft recommendations (Y.dv-ess, Y.trust-index, Y.STR, Y.trust-arch, Y.SNS-trust, Y.trust-pdm, Y.QKDN_FR, Y.QKDN_Arch, Y.QKDN_KM, Y.PII-Did, Y.energy-brokerage, Y.QKDN_SDNC, Y.QKDN_CM), the current living list items of Q16/13, but are not limited to.
14 – 25 October 2019	Geneva	ITU-T	16/13	– Q16/13 will deal with 12 draft recommendations (Y.dv-ess, Y.trust-index, Y.STR, Y.trust-arch, Y.SNS-trust, Y.trust-pdm, Y.QKDN_FR, Y.QKDN_Arch, Y.QKDN_KM, Y.PII-Did, Y.energy-brokerage, Y.QKDN_SDNC, Y.QKDN_CM), the current living list items of Q16/13, but are not limited to.

7. Closure

The Q16/13 Rapporteur thanked the delegates for their participation in the ad-hoc group activities to progress the work, and particularly the TSB SG 13 Secretariat and contributors for their support and active involvement during this meeting.

Annex A:
A.1 justification for proposed draft new Recommendation: Y.QKDN_SDNC

Question:	16/13	**Proposed new ITU-T Recommendation**	Geneva, 6 – 17 February 2017, Switzerland, 17-28 June 2019	
Reference and title:	Recommendation ITU-T Y. QKDN_SDNC "Software Defined Network Control for Quantum Key Distribution Networks"			
Base text:	Annex II		**Timing:**	2021-09
Editor(s):	Yongli Zhao, Beijing University of Posts and Telecom., China Zhangchao Ma, CAS Quantum Network Co., Ltd. China Junsen Lai, CAICT. China Yalin Li, QuantumCTek Co., Ltd. China		**Approval process:**	AAP

Scope (defines the intent or object of the Recommendation and the aspects covered, thereby indicating the limits of its applicability):

This recommendation specifies the control functions with the concepts of software defined networks (SDN) for QKDN. SDN has advantages for network control, such as software-defined control model, separation between control plane and forward plane, and open interface for the applications. The software defined control model is suitable to match the key management functions of QKDN. Based on the above consideration, it focuses on how to work SDN control function for QKDN. The scope of this draft recommendation includes the following, but not limited to:

- **Functional requirements of SDN controller in QKDN.** The functional requirements of SDN controller in QKDN is defined.
- **SDN-based control architecture in QKDN.** In this section, the detailed control architecture based on SDN is described. The SDN-based Control architecture can be considered as a part of QKDN architecture.
- **Controllable components in QKDN.** The components controlled by SDN controller are described in this section, which include the QKD channel resources and communication resources. For example, the tunable laser can be controlled by SDN controller.
- **SDN controlled node model for interoperability of QKDN.** The SDN controlled node model for QKDN is defined in this session. The SDN controlled node model is recommended to guarantee the interoperability QKD equipment from various vendors.
- **SDN control interfaces in QKDN.** The SDN control interfaces in QKDN are defined, especially which include the southbound interface and northbound interfaces.
- **Hierarchical SDN controller for multi-domain QKDN.** Multi-domain QKDN is necessary. Hierarchical SDN controller is defined to support multi-domain QKDN.
- **Applications scenarios for SDN controlled QKDN.** Application scenarios for SDN controlled QKDN are described, such as software defined data centers and software defined virtual private networks.
- **Security considerations.** The security considerations of SDN controlled QKDN are described.

Summary (provides a brief overview of the purpose and contents of the Recommendation, thus permitting readers to judge its usefulness for their work):

QKD network technologies have been ready for practical use in existing and future communications and security infrastructures. Control function with concepts of software-defined and open interfaces is necessary in QKDN. SDN has some advantages of control function in QKD networks, such as software-defined control model, separation between control plane and forward plane, and open interface for the applications. Also, the SDN control can be used to develop the control requirements of QKDN. For example, the tunable components of QKDN such as the tunable laser and optical switch should be controlled by SDN controller. On the other hand, multi-domain QKD networks should be controlled by SDN controller. This document is necessary to be focusing on how to deploy SDN control in QKDN.

This recommendation specifies the software-defined network control of QKDN. It includes the SDN-based control architecture, controllable components, functional requirements of SDN controller, SDN control interfaces, SDN controlled node model for interoperability, hierarchical SDN controller for multi-domain QKDN, related applications scenarios and the security considerations of SDN controlled QKDN.

Relations to ITU-T Recommendations or to other standards (approved or under development):

[1] ITU-T SG13 Y.QKDN_FR “Framework for Networks to support Quantum Key Distribution”
[2] ITU-T SG13 Y.QKDN_Arch “Functional architecture of the Quantum Key Distribution network”
[3] ITU-T SG17 X.sec_QKDN_ “Security Requirements for QKD Networks - overview”
[4] ITU-T SG17 X.sec_QKDN_km “Security Requirements for QKD Networks - Key Management”
[5] ITU-T SG13 Y.3300 “Framework of software-defined networking”
[6] ITU-T SG13 Y.3301 “Functional requirements of software-defined networking”
[7] ITU-T SG13 Y.3302 “Functional architecture of software-defined networking”
[8] ITU-T SG13 Y.3320 “Requirements for applying formal methods to software-defined networking”
[9] ITU-T SG13 Y.3321 “Requirements and capability framework for NICE implementation making use of software-defined networking technologies”
[10] ITU-T SG13 Y.3322 “Functional architecture for NICE implementation making use of software-defined networking technologies”
ISO/IEC JTC1 SC27 WG3, ETSI ISG QKD

Liaisons with other study groups or with other standards bodies:

ITU-T SG17, ETSI ISG QKD

Supporting members that are committing to contributing actively to the work item:

BUPT, CAS Quantum Network, Ministry of Industry and Information Technology (MIIT), China， QuantumCTek Co., Ltd., China

Annex B:
A.1 justification for proposed draft new Recommendation: Y.QKDN_CM

Question:	16/13	**Proposed new ITU-T Recommendation**	**Geneva, 16–28 June, 2019**	
Reference and title:	Recommendation ITU-T Y.QKDN-CM: Control and Management for Quantum Key Distribution Networks (QKDN-CM)			
Base text:	Annex II		**Timing:**	03-2021
Editor(s):	Hans Kim, hans9@kt.com, Taesang Choi, ETRI., choits@etri.re.kr, Jaehwan Jin, LGU+		**Approval process:**	AAP

Scope (defines the intent or object of the Recommendation and the aspects covered, thereby indicating the limits of its applicability):

This Recommendation is to specify the control, management, and orchestration of Quantum Key Distribution network as follows:

- Functional requirements of Quantum Key Distribution network control and management

  The requirements should include at least those of the following functionalities: path computation for routing control, session life-cycle control including access traffic steering/switching/splitting for session control, QoS and charging-based control for policy control, each layer FCAPS management, and multi-layer management orchestration, FCAPS management should provide capabilities of QKDN resource provisioning and configuration for inventory management, performance management including QKDN resource performance information collection and analytics, fault management including fault detection, root-cause analysis, diagnosis, and healing, accounting management for charging, and security management besides access control and authentication handled by the control layer such as attack detection, diagnosis, and mitigation.

- Functional architecture of Quantum Key Distribution network control, management, and orchestration
  - The functional architecture should specify detailed functional elements for control, management, and orchestration which will be defined in the functional requirements
- Management information model for Quantum Key Distribution network
- Control and management orchestration of multi-layers: Management layer include multiple functional elements responsible for multi-layers (Quontum, Key Management, Control, and User Network layers) and their management orchestration is required for the efficient management. Also for the some situations where management decisions can trigger control actions need orchestration between management and control layer.
- Reference points of Quantum Key Distribution network control, management, and orchestration
  - The reference points should specify control layer south and north bound reference points, management layer east-bound reference points for all layers, north-bound for management capability exposure, reference points for orchestration among multi-management functional elements
- Procedures of Quantum Key Distribution network control, management, and orchestration
- Implementation use cases of Quantum Key Distribution network control, management, and orchestration

Traditional FCAPS functionality which is not specific to QKDN is out of scope of this Recommendation. If necessary, the document will, instead, reference the existing works appropriately.

Summary

ITU-T Y.QKDN_FR, “Framework for Networks to support Quantum Key Distribution” work and ITU-T Y.OKDN.arch are under progress. Control and management of QKDN is essential requirements to be supported and their high-level requirements, tasks, and basic functional elements with associated the functional architecture are defined in the both documents.

To fulfill the tasks specified by both documents and any further functional requirements and tasks not yet detailed and identified such as

- control and management specific detailed functional elements (e.g., path computation for routing control, session life-cycle control including access traffic steering/switching/splitting for session control, QoS and charging-based control for policy control, each layer FCAPS management),
- management information model,
- control and management reference points among/between control and management functional elements and those of other layers including key management layer,
- control and management orchestration among multi-layers,
- interworking capabilities with external management systems, management capability exposure function, and etc.,

we propose a new work item, “Control and Management for Quantum Key Distribution Networks (QKDN-CM)”.

Relations to ITU-T Recommendations or to other standards (approved or under development):

Y.QKDN.FR, Y.QKDN.Arch, and Y.QKDN.KM

Liaisons with other study groups or with other standards bodies:

ETSI ISG OKD and ITU-T SG2, SG17

Supporting members that are committing to contributing actively to the work item:

<Member States, Sector Members, Associates, Academia>

ETRI, KT corp., KAIST, LGU+

Annex C:
Summary of Q16/13 meeting activities

Date	Morning		Afternoon	
17 Jun(Mon)	ML Workshop	ML Workshop	ML Workshop	ML Workshop
18 Jun (Tue)	Introduction, Y.QKDN_FR[R] (09:00~)	Y.QKDN_FR[R]	Tutorial-QKDN (13:30-14:30) Y.QKDN_FR[R]	Y.QKDN_FR[R]
19 Jun (Wed)	Y.QKDN_KM[R] (09:00~)	Y.QKDN_Arch[R] alignment with Y.QKDN_FR[R]	Y.dv-ess, Y.energy-brokerage (14:00~)	Y.trust-pdm
20 Jun (Thu)	Y.QKDN_FR[R] (09:00~)	Y.QKDN_FR[R]	New work item[R] (3) Open Bootstrap Framework (14:00~)	Y.trust-index, Y.trust-arch
21 Jun (Fri)	New work item[R] (1) SD-QKDN (09:00~)	New work item[R] (2) Control and Management QKDN	Y.PII-Did (14:00~)	TBD
24 Jun (Mon)	Drafting Review[R] (Y.QKDN_FR)	Drafting Review[R] (Y.QKDN_FR)	Drafting Review[R] (Y.QKDN_FR)	Drafting Review[R] (Y.QKDN_FR)
25 Jun (Tue)	Drafting Review New work item[R] (1) (09:00~)	Drafting Review New work item[R] (2)	Drafting Review[R] (Y.QKDN_FR)	Drafting Review[R] (Y.QKDN_FR)
26 Jun (Wed)	Drafting Review[R] (Y.QKDN_KM, Y.QKDN_Arch)	Drafting Review	Drafting Review New work item[R] (3)	Drafting Review (other documents)
27 Jun (Thu)	Drafting Review New work item[R] (1), (2) (09:00~)	Drafting Review Y.QKDN_FR[R]	Decision making for consent[R]	Liaisons, Meeting report review[R]
28 Jun (Fri)	WP1 PLEN	WP1 PLEN	WP2 PLEN	WP3 PLEN

NOTE - iftp site: http://ifa.itu.int/t/2017/sg13/exchange/wp3/q16/201906/
[R] - Remote participation – https://www.itu.int/myworkspace/home/index/remote_participation